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ATTN: Heather Osborn, Incidental Take Authorization Coordinator

November 26, 2024

RE: Middle Fork Vermilion River Erosion Mitigation and Streambank Stabilization – Revised Conservation Plan

Ms. Osborn,

Please find enclosed the above-referenced report.

If you have any questions or concerns, please contact Mr. Phil Morris, a member of our Corporate Environmental team, at phil.morris@vistracorp.com or (618) 606-7788.

Sincerely,
Dynegy Midwest Generation, LLC

A handwritten signature in blue ink that reads 'Dianna Tickner'.

Dianna Tickner, PE, PMP
Senior Director, Demolition and Decommission

Enclosure

bcc: D. Tickner – Vermilion Site
P. Morris – Collinsville Vermilion Riverbank Erosion electronic file (box)
Vic Modeer – Asset closure



Conservation Plan and Implementing Agreement

Middle Fork Vermilion River Erosion and
Streambank Stabilization

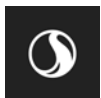
November 14, 2024

Prepared for:

Dynegy Midwest Generation, LLC

Prepared by:

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Abbreviations

BMP	Best Management Practices
C	Celsius
cm	Centimeter
CWA	Clean Water Act
DMG	Dynegy Midwest Generation, LLC
F	Fahrenheit
ft	Feet
g	gram
HUC	Hydrologic Unit Code
IDNR	Illinois Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
IESPA	Illinois Endangered Species Protection Act
In	inch
INHD	Illinois Natural Heritage Database
INHS	Illinois Natural History Survey
Km	Kilometer
m	Meter
mm	Millimeters
NAP	North Ash Pond
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
OEAP	Old East Ash Pond
OHWM	Ordinary High Water Mark
Oz	ounce
PIT	Passive Integrated Transponder
SCUBA	Self-Contained Breathing Apparatus
Stantec	Stantec Consulting Services Inc.
TSS	Total Suspended Solids
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geographical Survey
yr	Year



CONSERVATION PLAN AND IMPLEMENTING AGREEMENT

Description of Impacts

1.0 DESCRIPTION OF IMPACTS

Dynegy Midwest Generation, LLC (DMG) is proposing to stabilize riverbanks along the Middle Fork Vermilion River (hydrologic unit code [HUC] 05120109) at the Vermilion Site in Oakwood, Illinois. The proposed action will include potential installation of one lateral erosion control installation, less than 500 linear feet. This approximately up to 500-foot erosion control will be installed, as needed and based on extent and location of eroded area, and within a 1,900-foot (580 meter) long segment of the right descending streambank of the project site to mitigate erosion and lateral migration of the Middle Fork Vermilion River (the Project). The area of impact will be 0.14 acres, extending 8" to 12" from the bank. DMG retained Stantec Consulting Services Inc. (Stantec) to complete a Conservation Plan for construction impacts from this Project for Illinois Endangered Species Protection Act (IESPA) listed species.

A mussel survey was conducted on September 16-17, 2018 by Stantec biologists as requested by Illinois Department of Natural Resources (IDNR; Stantec 2018). This survey was intended to assess the presence or probable absence of special status mussel species within the erosion control area. A total of 33 live mussels from eight species were collected during a field effort that consisted of 13.3 person-hours of self-contained underwater breathing apparatus (SCUBA) and snorkel searches (Appendix A; Stantec 2018). An additional 16 mussel species were found as spent shells. Species observed included six live Wavyrayed Lampmussel (*Lampsilis fasciola*) which is IDNR-listed endangered, along with weathered shells of the federal-listed endangered Northern Riffleshell (*Epioblasma rangiana*) and IDNR-listed threatened Purple Wartyback (*Cyclonaias tuberculata*). Additionally, a single Bluebreast Darter (*Etheostoma camurum*), an IDNR-listed endangered fish, was observed during the mussel survey.

The IDNR-listed endangered mussel species, Wavyrayed Lampmussel is known to occur in the Middle Fork Vermilion River, and within the immediate vicinity of the Project area (Stantec 2018). The IDNR-listed endangered fish Bluebreast Darter is known to occur within riffle habitat immediately upstream of the Project area, as well as throughout the Middle Fork Vermilion and Vermilion River basins (Tiemann 2008). Federal and IDNR-listed endangered Northern Riffleshell is known to occur in the Middle Fork Vermilion River due to efforts to recolonize the river with translocated individuals from Pennsylvania after being extirpated from the state (Tiemann et al. 2017). As of December 2017, a total of 3,699 Northern Riffleshell had been translocated by Illinois Natural History Survey (INHS) into the Vermilion River basin (Tiemann et al. 2017).

Three additional species, federal and IDNR-listed endangered Clubshell (*Pleurobema clava*), IDNR-listed threatened Eastern Sand Darter (*Ammocrypta pellucida*), and IDNR-listed endangered Bigeye Chub (*Hybopsis amblops*) were not observed during the pre-construction mussel survey but are known within the vicinity of the Project area (Tiemann et al. 2017, INHS 2018). Because these three species have potential to exist within the Project area, they will be included in this Conservation Plan and subsequent Incidental Take Authorization.

1.1 IDENTIFICATION OF AREA TO BE AFFECTED BY PROPOSED ACTION

If implemented, construction for the proposed Project will occur on the right descending bank of the Middle Fork Vermilion River at approximately River Mile 8.1 (Figure 1, Appendix B). The Middle Fork Vermilion River at the Project site has an approximate drainage area of 425 square miles (1,100 square kilometers [km]). The Project area (Table 1) is north (upstream) of Kickapoo State Recreation Area, west of Danville, Illinois, and can be found on the Danville NW,



CONSERVATION PLAN AND IMPLEMENTING AGREEMENT

Description of Impacts

Illinois U.S. Geological Survey (USGS) 7.5-minute series topographic map (Appendix B). The Project area occurs within the Glaciated Wabash Lowlands Ecoregion, which is characterized by till plains with rugged ravines, floodplains, and terraces. This terrain and associated conditions create the gravel bottoms and riffles characteristic of portions of the Vermilion River system (USEPA 2005). The Project area is accessed by traveling approximately 0.5 miles (0.8 km) northeast through the former Vermilion Power Station on East 2150 North Road, Danville, Illinois. Site photos are included in Appendix A. The Middle Fork Vermilion River is part of the Vermilion River drainage, which is a tributary to the Wabash River.

The Project area consists of approximately 1,900 linear feet of the right descending bank of the Middle Fork Vermilion River which is currently eroding (Stantec 2017). Erosion rates vary up to 1 to 3.6 feet per year (ft/yr), as a maximum (Stantec 2017). Sediment supply of the Middle Fork Vermilion River appears to be moderate to high with numerous channel bars observed within, upstream, and downstream of the Project site. This sediment supply likely contributes to erosion rates during high flow events. Segments of the existing streambank contain vegetative communities with poor rooting depth and density.

The Project construction will directly impact the streambank that will be solely the installation of erosion control riprap. The erosion control is less than 500 ft in length and would include riprap being placed below the ordinary high water mark (OHWM) of the river. However, construction equipment will work from the top of the riverbank to reduce impacts to the streambed and mussel communities.

Table 1. Project Site Location

Site	Latitude	Longitude
Middle Fork Vermilion Downstream Project Extent	40.18244	-87.74229
Middle Fork Vermilion Upstream Project Extent	40.185294	-87.74483

1.2 BIOLOGICAL DATA ON AFFECTED SPECIES

A list of species with potential to occur within the Project was developed from a combination of the Ecological Compliance Assessment Tool (EcoCAT), which is an online database provided by IDNR (IDNR 2022c; Appendix C) and the species observed during the mussel survey in 2018 (Stantec 2018; Appendix A).

1.2.1 Wavyrayed Lampmussel (*Lampsilis fasciola*, Rafinesque 1820)

Wavyrayed Lampmussel is IDNR-listed as endangered by the state of Illinois (IDNR 2022a). It is categorized as globally secure (G5) and critically imperiled (S1) in Illinois by NatureServe (2022). Six individuals were observed during a 2018 mussel survey of the Project area (Stantec 2018). The shell of this species is medium sized and thin when young, ovular in shape, and somewhat sexually dimorphic (Watters et al. 2009). Wavyrayed Lampmussel is given its name for its numerous, small, green wavy rays along the exterior of the yellow shell (Appendix A). This species is known for extreme polymorphism in its mantle lure displays, having at least four distinct lure variations, which assist in attracting potential fish hosts used by its glochidia during a complicated life cycle (Zanatta et al. 2007).



CONSERVATION PLAN AND IMPLEMENTING AGREEMENT

Description of Impacts

Generally considered a high-water-quality species, Wavyrayed Lampmussel is found in fast flowing streams in relatively shallow water (<3 ft/1 m) with sand to cobble substrates (Watters et al. 2009). Wavyrayed Lampmussel is considered widespread throughout the Vermilion River drainage but is restricted to only that portion of Illinois (Tiemann et al. 2017, INHS 2018, Cummings and Mayer 1992). Wavyrayed Lampmussel was documented as recently as 2013 approximately 2.4 km upstream of the proposed Project area (INHS 2018). Wavyrayed Lampmussel is bradytic, spawning in August and carrying glochidia until the following May-August (Zale and Neves 1982). It is believed that Wavyrayed Lampmussel may carry two broods, with gravid females found from August to October, and again May to August (Ortmann 1919, Watters and O'Dee 1996). The known fish hosts of this species include Longear Sunfish (*Lepomis megalotis*), Smallmouth Bass (*Micropterus dolomieu*), and Largemouth Bass (*Micropterus salmoides*) (Watters et al. 2009). The reproductive cycle is similar to most other freshwater mussels, requiring a fish host for the parasitic glochidia larval stage. Individuals grow rapidly for the first 4-6 years of life, becoming reproductive around Year 3 (COSEWIC 2010). Large individuals with lengths of greater than 3.9 inches (in; 100 millimeters [mm]) can be 10-15 years old, and individuals greater than 20 years old are rare (Watters et al. 2009).

1.2.2 Northern Riffleshell (*Epioblasma rangiana*, Lea 1838)

Northern Riffleshell is listed as federally endangered and IDNR-listed endangered (USFWS 1993, IDNR 2022a). It is categorized on NatureServe as critically imperiled globally (G1) and critically imperiled (S1) in Illinois (NatureServe 2022). Previously extirpated from Illinois, this species was recently translocated to multiple locations in the Salt Fork and Middle Fork Vermilion Rivers by Illinois Natural History Survey from the Allegheny River in Pennsylvania (Tiemann 2014, Tiemann et al. 2015, Tiemann 2015, Tiemann et al. 2016, Tiemann et al. 2017). Shells are medium-sized (approximately 2.75 in [70 mm]) and oval in shape, with males posteriorly pointed (Watters et al. 2009). Sexual dimorphism is present in this species, with females often having a prominent protrusion along the ventral to posterior margins, termed “marsupial swelling” (Watters et al. 2009). Shells are yellow, usually with green rays from umbo to margin (Appendix A).

This species is known to be bradytic, with females found gravid from September to the following June (Ortmann 1919). Females use a bright white lure to draw in fish hosts, which become trapped between the closing valves of the mussel. The female then pumps the fish full of glochidia to ensure parasitism (Watters et al. 2009). Confirmed host fish for this species include Mottled Sculpin (*Cottus bairdi*), Bluebreast Darter, Rainbow Darter (*Etheostoma caeruleum*), and Banded Darter (*Etheostoma zonale*) (Watters et al. 2009). The reproductive cycle is similar to most other mussel species, requiring a fish host for the parasitic glochidia larval stage. This species is known to move to the substrate surface during brooding in winter and spring. Individuals grow quickly for the first three years and, on average, will live up to 15 years (Watters et al. 2009).

1.2.3 Clubshell (*Pleurobema clava*, Lamarck 1819)

Clubshell is listed as federally endangered and as IDNR-listed endangered (USFWS 1993, IDNR 2022a). It is categorized as critically imperiled (G1) globally and critically imperiled (S1) in Illinois along with six other states and is presumed extirpated in Alabama and Nebraska (NatureServe 2022). This species was previously thought to be extirpated from Illinois (Cummings et al. 1998) but a live individual was found during a 1996-1998 survey (Szafoni et al. 2000). Neither shells nor live animals were observed during 2018 surveys of the Project area. Recently, mussels salvaged from the Allegheny River in Pennsylvania have been moved to Illinois in an attempt to re-establish populations locally. From 2012-2014 and 2016, a total of 1,420 Clubshell were translocated to five sites in the Middle Fork Vermilion



CONSERVATION PLAN AND IMPLEMENTING AGREEMENT

Description of Impacts

River (Tiemann 2014, Tiemann et al. 2015, Tiemann 2015, Tiemann et al. 2016, Tiemann et al. 2017). All five of these sites are upstream of the proposed Project area. Average annual survival for Clubshell translocated between 2012 - 2014 was 0.79 or 79 percent per year (Stodola et al. 2017). High-flow events during summer of 2015 were observed to displace translocated mussels downstream, decreasing survival rates. Survival was greatest in the fourth year following release (Stodola et al. 2017). In other studies, survival of this species has proven difficult to calculate due to Clubshell's tendency to burrow deep in the substrates, often out of range of passive integrated transponder (PIT) tag detectors (Dr. G. Thomas Watters, Ohio State University, personal communication 2017).

Clubshell is a triangular shaped freshwater mussel that may live for 20 years (Watters et al. 2009). Shells grow up to 3 in (76 mm) in length, but average 1-1.5 in (25-38 mm). The light brown to tan shells may have distinct dark green rays that are interrupted by growth lines. A sulcus may be present in older individuals. This species is not sexually dimorphic. Clubshell usually occurs in clean, coarse sand and gravel associated with riffle and run habitats, in medium to large rivers. The species cannot tolerate mud or slackwater conditions. Clubshell lives buried in the substrate and is known to come to the surface during the breeding period, making it susceptible to siltation. Smith et al. (2001) surveyed the Allegheny River in July, finding 59 percent of Clubshell to be buried in the substrate. The species is tachytictic, with eggs appearing in May and glochidia developing in June and July (Watters et al. 2009). Females infect fish hosts by release of a white conglutinate that is perceived as a prey item. O'Dee and Watters (2000) determined glochidia on Central Stoneroller Minnow (*Campostoma anomalum*), Striped Shiner (*Luxilus chrysocephalus*), Blackside Darter (*Percina maculata*), and Common Logperch (*Percina caprodes*) successfully metamorphosed in a laboratory setting.

1.2.4 Bluebreast Darter (*Etheostoma camurum*, Cope 1870)

Bluebreast Darter is an IDNR-listed endangered species (IDNR 2022a). NatureServe (2022) categorizes it as globally apparently secure (G4) and imperiled (S2) in Illinois, Virginia, and Ohio, and critically imperiled (S1) in New York and Alabama. Bluebreast Darter is limited to the Vermilion River basin in Illinois, with populations documented in Kickapoo State Park (downstream of the Project site) found in 2006, 2011, and 2016 (Trent Thomas, IDNR, personnel communication November 11, 2018). This species was found in numerous locations throughout the Middle Fork Vermilion River basin between 1960 and 2011 (INHS 2018). This species, as well as other darters (subgenus *Nothonotus* spp.), are believed to be expanding in range, partially as result of improving water quality conditions under the Clean Water Act (CWA; Honick et al. 2017). Implementing additional targeted sampling techniques may reveal expanded ranges compared to historical sightings. This species is known to occur in moderate to large sized streams with consistently low turbidity (Trautman 1981). These fish prefer faster flowing water and deep riffles with large cobble to boulder substrate (Trautman 1981, Tiemann 2008). No other streams in the historic range of this species in Illinois provide the appropriate conditions for Bluebreast Darter (Tiemann 2008).

Characterized by white and black edged dorsal, anal, and caudal fins, this medium sized darter reaches approximately 3.9 in (100 mm) and 0.25 ounces (oz; 7 grams [g]) maximum (Trautman 1981) and is most similar to Spotted Darter (*Etheostoma maculatum*). Characteristics that distinguish Spotted Darter include a more pointed snout and no fin margination or dusky vertical fins, and Spotted Darter is not found outside of its natural range within Illinois. Bluebreast Darter is a benthic insectivore known to feed on midge larvae, and mayfly and stonefly nymphs (Tiemann 2008). Bluebreast Darter generally spawns from late April to mid-June, utilizing the sand/gravel patches on the downstream side of large boulders in swift riffles (Mount 1959, Tiemann 2008).



CONSERVATION PLAN AND IMPLEMENTING AGREEMENT

Description of Impacts

1.2.5 Eastern Sand Darter (*Ammocrypta pellucida*, Putnum 1863)

Eastern Sand Darter is IDNR-listed as a state threatened species (IDNR 2022a). The species is categorized as apparently secure (G4) globally and vulnerable (S3) in Illinois (NatureServe 2022). Eastern Sand Darter is limited to the Vermilion River, Embarras River, and Little Wabash River systems in Illinois (INHS 2018). The Illinois Natural Heritage Database (INHD) includes one occurrence of Eastern Sand Darter within the Middle Fork Vermilion River basin (upstream of the Project site), which was recorded during monitoring efforts conducted in 2016. However, the fish may be present in low abundances throughout the Middle Fork Vermilion River (Trent Thomas, IDNR, personal communication on November 8, 2018; Jeremy Tiemann, INHS, personal communication on November 11, 2018; INHS 2018). This species prefers high quality streams and small rivers with sandy substrates and water depths of at least 60 centimeters (cm). Major threats facing Eastern Sand Darter in Illinois include siltation, declining water quality, and impoundment construction (IDNR 2022b).

Eastern Sand Darter has an elongated body up to 3.25 in (82.5 mm) in length and a single spine in the anal fin. It is characterized by 12-17 dark-green dorsal blotches and 10-19 horizontal dark-green blotches on along each side. This species, like other darters, conceals itself by burrowing into sandy substrates and darting out to capture prey. Their diet primarily consists of small crustaceans and insect larvae (IDHS 2018). Spawning generally occurs between June and mid-August when water temperatures are between 68.9° Fahrenheit (F; 20.5°Celsius [C]) and 77.9° F (25.5° C), however; the timing is variable among populations and little is known about spawning within the Vermilion River drainage (Facey 1998, Grandmaison et al. 2004). Ohio River basin Eastern Sand Darter are believed to spawn between June and July (Grandmaison et al. 2004).

1.2.6 Bigeye Chub (*Hybopsis amblops*, Rafinesque 1820)

Bigeye Chub is IDNR-listed as a threatened species (IDNR 2022a) and categorized by NatureServe (2022) as globally secure (G5) and vulnerable (S3) in Illinois. Bigeye Chub has been confirmed present in the Vermilion River, the Little Wabash River, and other small tributaries to the Wabash River (IDNR 2014). The INHD includes 273 individuals found throughout (upstream and downstream of the Project site) the Middle Fork Vermilion River system, which were documented during monitoring efforts conducted between 2006 and 2016 (INHD 2018; Trent Thomas, IDNR, personal communication on November 8, 2018). This species prefers high quality streams with sandy, gravel or rocky substrates in pools with little to no current near riffles. Bigeye Chub is highly intolerant to siltation and declining water quality (IDNR 2014).

Bigeye Chub has a long and narrow, silvery body up to 4 in (102 mm) in length with a blunt nose and large eyes. This species is characterized by a dark stripe that begins at the nose and extends along the sides to the base of the tail. Spawning occurs in late spring and extends through early summer; however, little is known about spawning habitat preference and behavior (IDNR 2014). Bigeye Chub in the Flint River of Alabama were shown to spawn from March to June (Tarver 2015); however, the timing of thermal cues that typically trigger reproduction may differ in the Project area.



CONSERVATION PLAN AND IMPLEMENTING AGREEMENT

Description of Project Activities

2.0 DESCRIPTION OF PROJECT ACTIVITIES

Some areas of a 1,900-ft section of the right descending bank of the Middle Fork Vermilion River could be at risk of lateral erosion along the Old East Ash Pond (OEAP) and North Ash Pond (NAP). The DMG began monitoring this section of riverbank to provide measurable data on the amount of erosion occurring. The monitoring is described in detail in Section 2.1.1 below. If the lateral erosion reaches a designated threshold, it will trigger the installation of a temporary erosion control feature. Based on past erosion events, this stabilization feature may be needed while the OEAP and NAP are functioning ash ponds and during the closure process. However, it is possible that the riverbank will remain stable until DMG has completed closure of the OEAP and NAP and that no bank stabilization will be needed.

For this Project in January 2024, U.S. Army Corps of Engineers (USACE) has issued a 404 permit. Illinois Environmental Protection Agency (IEPA) issued an associated 401 certification. IDNR has issued floodplain and dam safety permits as well. The U.S. Fish and Wildlife Service (USFWS) issued a biological opinion in 2019. As included in the January 2024 issued 404 permit, US National Park Service issued a section 7(a) evaluation and determination letter, approving the Project. Furthermore, IEPA approved the First Amended Safety and Emergency Response Plan in June 2023, approving the erosion plans.

2.1 MAINTENANCE OF RIVERBANK

2.1.1 Erosion Monitoring

Monitoring of the riverbank along the OEAP and NAP for erosion has been ongoing and will continue until closure of the OEAP and NAP is complete. The monitoring program was designed to determine when the installation of temporary erosion protection is necessary to install. Monitoring activities consist of 5-ft ground-rods placed in vertical profiles every 25-ft along the riverbank. Three ground rods are placed at each profile: at the bottom of the riverbank, the middle of the riverbank, and top of the riverbank. Ground-rod monitoring is performed monthly and consists of measuring the lateral distance from the tip of the rod to the riverbank. The berms and riverbanks along the OEAP and NAP are also monitored visually on a weekly basis for potential stability issues such as cracking, surface erosion, seeps, etc.

2.1.1.1 Erosion Trigger

If lateral erosion progresses and yields a slope stability factor of safety (FoS) of approximately 1.5, the erosion protection measures process will be initiated. Riprap has already been stockpiled on-site. A long-reach excavator will be staged on land and used to install the riprap. Equipment and personnel will not enter the river. Riprap installation will take approximately one week. At a point of erosion significantly before a FoS of 1.3 is reached, a biologist will implement the relocation and monitoring plan, estimated to take two weeks. After relocation, riprap installation will begin.



CONSERVATION PLAN AND IMPLEMENTING AGREEMENT

Anticipated Adverse Effects on Listed Species

2.1.2 First Amended Safety Emergency Response Plan – Erosion Mitigation Riprap Design

Refer to the erosion mitigation riprap design, dated July 2023, in Appendix E. Riprap will be removed after ash pond closure is completed.

3.0 ANTICIPATED ADVERSE EFFECTS ON LISTED SPECIES

3.1 DIRECT EFFECTS

Direct effects to a listed species, as defined by the USFWS and the National Marine Fisheries Service (NMFS), are effects that occur from the action and occur immediately or at the same time and place as the action (USFWS and NMFS 2016). The Project activities that will result in direct effects include: crushing of mussels, entrapment of mussels in substrate, temporary decline in water quality, and stress through relocation. A description of each of these activities is included below.

3.1.1 Erosion Monitoring

There are no direct effects from the erosion monitoring stage of the Project activities. No in-water work is proposed for this activity.

3.1.2 Handling Stress

Short term impacts of relocation will be experienced by mussels as they are removed from the river and moved to the relocation area. Improper handling and exposure of mussels has been shown to cause mortality and/or abortion of glochidia in gravid females (Waller et al. 1995) but can easily be reduced or avoided with proper handling protocols such as avoiding extreme temperatures, dehydration or drying out, and overcrowding of animals (Dunn et al. 1999).

3.1.3 Direct Effects of Erosion Mitigation Riprap Installation

3.1.3.1 Crushing of Mussels

Mussels could be crushed during the installation of an aggregate SERP erosion mitigation riprap design (temporary riverbank maintenance measure). Crushing can occur while the aggregate and the stone toe protection is being placed in the stream channel. Mussels affected would be in the water directly below the location of lateral erosion and within a maximum of 250 ft upstream and 250 ft downstream.

3.1.4 Short-term Water Quality Degradation

Instream activities, if performed, are predicted to cause temporary increases in total suspended solids (TSS) downstream of the Project area. Increased TSS can result in settling and deposition of solids in gravel or cobble streambeds, reducing the average sediment size (Bilotta and Brazier 2008). This could impact freshwater mussel populations downstream of the SERP erosion mitigation riprap installation and then the SERP erosion mitigation riprap removal site, forcing individuals to unbury themselves from depositing sediments. The effect of increased TSS



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Anticipated Adverse Effects on Listed Species

quantities has been infrequently studied, and with mixed results. Bucci et al. (2008) showed that high turbidity (20-75 nephelometric turbidity unit [NTU]'s) did not impair the valve gape (an indication of feeding activity) for Fat Mucket (*Lampsilis siliquoidea*). Meanwhile Aldridge et al. (1987) showed that exposure to suspended solids resulted in decreased metabolic rates in three species of mussels. Increased suspended sediments have been shown to decrease mussel larval (glochidia) attachment and metamorphosis rates (Beussink 2007).

Sediment deposition can inhibit egg incubation, respiration, and immune function in fish (Greig et al. 2005, Bilotta and Brazier 2008). Comprehensive studies on egg burial exist for salmonids and other highly managed fisheries but are lacking for species known to occur in the Project area. Fish have been shown to exhibit a physiological stress response to increases in suspended solids (Au et al. 2004). The expected response in this system would be for fish to mobilize out of impacted areas to those with more suitable TSS concentrations (i.e., lower). Further, there will be temporal avoidance for some life stages as construction. Bluebreast Darter should be finished with egg incubation by the end of June (Mount 1959, Tiemann 2008).

Terrestrial silt fences should minimize most TSS increases during construction. Concentrations and duration of TSS increases are expected to be lower than those experienced during high flow/flood events. Turbidity levels at USGS gauge 03339000 Vermilion River Near Danville, IL, often exceed 100 NTU's during flood events. An aggregate SERP erosion mitigation riprap will change the depth profile of the stream and the available substrate in the immediate area of the SERP erosion mitigation riprap for the duration of the Project. Fish will be expected to mobilize out of these habitats as they become potentially unsuitable.

3.1.5 Direct Effects of Erosion Mitigation Riprap Removal

3.1.5.1 Crushing of Mussels

Mussels will likely colonize the aggregate that is installed below the water level and these mussels could be crushed during the removal of an aggregate SERP erosion mitigation riprap design. Crushing can occur while the aggregate and the stone toe protection is being removed from the stream channel. Mussels affected would be in the water within the crevices of the aggregate or directly adjacent to the aggregate SERP erosion mitigation riprap.

3.2 INDIRECT EFFECTS

3.2.1 Reduced Sediment Load From Bank Erosion (Beneficial Long-term)

If a SERP erosion mitigation riprap design is installed, sedimentation of downstream areas should be reduced as erosion of the right descending bank is prevented. Currently, erosion rates are on average, 2.3 ft (0.7 m) per year, which is contributing to the sedimentation of the stream. This area of the Middle Fork Vermilion River is noticeably sedimented due to eroding banks, both within the Project area and upstream. This temporary erosion control will not eliminate high TSS concentrations downstream but will incrementally reduce overall sediment loads while the ash ponds are closed, a benefit to mussel and fish species downstream. Respiration and egg incubation for fish species should be improved following lowered TSS concentrations.



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3.2.2 Temporal Impacts

Project activities should not impact the Bluebreast Darter population upstream of the Project area. Downstream riffles may be impacted by increased TSS caused by in-stream construction work. Increased turbidity and sediment deposition of cobble/boulder habitat could negatively impact Bluebreast Darter spawning (late April to mid-June) (Mount 1959), as they require clear water and specific gravel/sand compositions behind large riffle rocks (Trautman 1981, Tiemann 2008). However, due to the relatively short installation period of each SERP erosion mitigation riprap, the siltation and reduced water quality will likely dissipate quickly.

Instream work resulting in increased TSS will also impact downstream individuals outside of the proposed Project area. Wavyrayed Lampmussel require host fish to encyst their glochidia on fish for the parasitic portion of their life cycle. Part of this process involves a visual component of host fishes seeing the modified mantle lure on adult females, inducing attempted predation by fish of the adult mussel and subsequent encystment of glochidia. Increased TSS could reduce efficacy of the female's mantle lure and overall mussel recruitment. Survival would most likely not be impacted because sediment deposition rates would not exceed the vertical migration abilities of individual mussels.

Similar adverse impacts exist for Northern Riffleshell (Ortmann 1919) and Clubshell (Watters et al. 2009). Northern Riffleshell and Clubshell are also dependent on fish attempting to feed on their attractant lure, then subsequent transfer of glochidia to the host fish. Increased TSS and turbidity could result in decreased recruitment due to lower propensity to obtain fish hosts. Survival would most likely not be impacted because sediment deposition rates would not exceed the vertical migration abilities of individual mussels.

Eastern Sand Darter is present within the Vermilion River; however, in low abundances. Project activities are likely to impact Eastern Sand Darter populations downstream of the Project site as they may be impacted by increased TSS as a result of SERP erosion mitigation riprap installation and removal. Additionally, increased turbidity and sediment deposition of cobble/boulder substrates may also negatively affect Eastern Sand Darter as they are highly intolerant of reduced water quality and prefer sandy substrates for spawning (Grandmaison et al. 2004). However, due to the relatively short installation period of each SERP erosion mitigation riprap, the siltation and reduced water quality will likely dissipate quickly.

Project activities are unlikely to impact the Bigeye Chub populations upstream of the Project area. Downstream riffles may be impacted by increased TSS resulting from instream construction work. Increased turbidity and sediment deposition of cobble/boulder habitat may negatively impact Bigeye Chub, especially during spawning (late spring through early summer), as they are highly intolerant to siltation and reduced water quality (IDNR 2014). However, due to the relatively short installation period of each SERP erosion mitigation riprap, the siltation and reduced water quality will likely dissipate quickly.

4.0 MINIMIZATION AND MITIGATION

4.1 PLANS TO MINIMIZE IMPACTED AREA

In an effort to minimize the impact on threatened and endangered mussels, a SERP erosion mitigation riprap design is a maximum of 500 ft in length and will only be installed if the erosion trigger is met (see Section 2.1.1.1). No construction



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equipment will be used below the ordinary high water mark. All construction equipment will be located along the top of the riverbank and a long reach excavator will be used to place aggregate and stone toe protection. Additionally, best management practices (BMPs) including silt fence or filter sock along the streambank will be in place to reduce downstream impacts. Construction impacts are expected to cover an area of habitat directly below the ordinary high water mark from the point of lateral erosion to a maximum of 250 ft upstream and 250 ft downstream. Construction impacts to fish should also be temporary, as finished construction should result in a stable streambank suitable for recolonization.

4.1.1 Wavyrayed Lampmussel

Estimated take of Wavyrayed Lampmussel was determined based on the September 2018 survey of the Project area, historical records for the Wabash River drainage, and comparable quantitative surveys involving healthy Wavyrayed Lampmussel populations. Historical records provide basin-wide context for the health of Wavyrayed Lampmussel, but often lack quantitative data needed to calculate probable densities in the Project area (Cummings et al. 1998, Szafoni et al. 2000). The September 2018 quantitative survey efforts examined approximately 9,500 ft² (880 m²) of habitat, yielding one Wavyrayed Lampmussel from this portion of the survey (Stantec 2018). Each SERP erosion mitigation riprap will impact the following maximum calculated area:

$$500 \text{ ft linear length} \times 5 \text{ ft deep from bank out to stream} = 2500 \text{ ft}^2$$

Using this amount of impact area and applying it to the quantitative area surveyed (9,500 ft²), the amount of impact area per SERP erosion mitigation riprap design is approximately 26.3% of the quantitative survey area. Applying this percent to the number of Wavyrayed Lampmussel observed in the quantitative survey area, the amount of take of Wavyrayed Lampmussel will be a fraction of an individual (0.2632). However, the entire Project area is approximately 1,900 linear ft and SERP erosion mitigation riprap structures impact approximately 5 feet of riverbed, measured perpendicular beginning at the bank, which calculates to approximately 9,500 ft². Using the quantitative survey estimate of one Wavyrayed Lampmussel existing within that amount of streambed, the take for this Project will be no more than one Wavyrayed Lampmussel. Qualitative surveys showed that in suitable habitat, denser populations could be present. This type of habitat was not seen within the transect areas near and downstream of the Project area. Most Wavyrayed Lampmussel observed during the qualitative portion of the survey were from the gravel/cobble dominated substrate in normal run habitat upstream of the Project area.

Stodola et al. (2013) found 41 individuals at 11 sites throughout the Vermilion River Basin during extensive basin-wide inventory surveys. Szafoni et al. (2000) found a total of 18 Wavyrayed Lampmussel at three of eight surveyed sites throughout the North Fork Vermilion River, indicating low overall densities. A total of eight individuals were collected by Suloway et al. (1981) in the entire Vermilion River drainage, with none found in the Middle Fork Vermilion River. Wavyrayed Lampmussel was not originally discovered in the Middle Fork Vermilion River by Baker (1922) in mollusk surveys of Vermilion River, then they were later reported in the 1950's but noticeably absent through surveys in the 1970's and 1980's (Suloway et al. 1981). Therefore, historic data supports a low expected take of Wavyrayed Lampmussel in the proposed Project area.

In a survey of the Stillwater River in West Milton, Ohio, Stantec personnel found 26 live Wavyrayed Lampmussel during a dam drawdown that resulted in mussel beds being exposed as water levels receded (Stantec 2015). Seventeen and nine individuals were found respectively in two cells of approximately 107,640 ft² (10,000 m²) in area, representing densities of 0.0009 – 0.0017 individuals per m². These sites were found to have highly abundant and diverse mussel



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beds, indicating healthy communities. This presumed healthy population density range mimicked in the proposed Project area would estimate between 0.794 to 1.500 individuals for the impact area of 9,500 ft². Based on the preceding information we conservatively estimate take of Wavyrayed Lampmussel to be between 1 – 2 individuals for the installation of a SERP erosion mitigation riprap and then another 1 – 2 individuals for the removal of that SERP erosion mitigation riprap.

4.1.2 Northern Riffleshell

Estimated take of Northern Riffleshell is based off translocation data from Illinois Natural History Survey (Tiemann et al. 2015, Tiemann et al. 2016, Stodola et al. 2017). A total of 1,076 Northern Riffleshell were translocated from Pennsylvania to the Middle Fork Vermilion River between 2013 and 2016. These individuals were all placed upstream of the proposed Project site and, as indicated by the two spent valves found during the September 2017 mussel survey, could inhabit (live or dead) the Project area due to being washed downstream of their translocation site. Average estimated overall survival of Northern Riffleshell in the Middle Fork Vermilion River was 4% in 2016, with estimated annual survival at 30% (Stodola et al. 2017), indicating some individuals could have been transported downstream to the proposed Project site.

Despite large numbers of relocated Northern Riffleshell at multiple sites upstream, the habitat within the Project area is not ideal for long-term survival under current conditions due to lack of stable substrate. However, we conservatively estimate Northern Riffleshell take of between 1 – 5 individuals for the installation of a SERP erosion mitigation riprap and another 1 – 5 individuals for the removal of the SERP erosion mitigation riprap design.

4.1.3 Clubshell

Estimated take of Clubshell is based off translocation data from Illinois Natural History Survey (Tiemann et al. 2015, Tiemann et al. 2016, Stodola et al. 2017). A total of 1,420 individuals were translocated from Pennsylvania to the Middle Fork Vermilion River in recent years, and most likely represent the entirety of the local population. Similar to Northern Riffleshell, these individuals may have been washed downstream from their original translocation site into the Project area (either live or as shells). Stodola et al. (2017) showed that estimated annual survival was approximately 79% for Clubshell, which is much higher than Northern Riffleshell. This suggests higher translocation site retention but does not preclude occupancy within the proposed Project site. Despite higher numbers of total translocated Clubshell individuals, combined with a higher annual survival and lack of suitable substrate within the Project area leads to a take estimate of 1 – 5 animals for the installation of a SERP erosion mitigation riprap and another 1 – 5 individuals for the removal of a SERP erosion mitigation riprap.

4.1.4 Bluebreast Darter

The previous survey of the Project area did not include fish sampling; therefore, estimated take of Bluebreast Darter is based on historical densities in the Middle Fork Vermilion River. A quantitative sampling study by Tiemann (2008) yielded densities of 0.000 to 0.071 individuals per m² (mean: 0.025 ± 0.0282) in the Middle Fork Vermilion River. The riffle area where an anecdotal observation of Bluebreast Darter took place is approximately 3,000 ft² (280 m²). Based on Tiemann (2008)'s data, this would result in take of a maximum of 22 individuals within the 9,500 ft² Project area. The pool habitats slated for construction are unlikely to contain large numbers of Bluebreast Darter. Due to the avoidance of the identified Bluebreast Darter habitat, we estimate take to be between 1 – 7 individuals for the installation



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of one SERP erosion mitigation riprap structures and another 1 – 7 individuals for the removal of SERP erosion mitigation riprap structures.

4.1.5 Eastern Sand Darter

Quantitative population data for Eastern Sand Darter is sparse, with only one record of this species for the Middle Fork Vermilion River. However, they are still believed to inhabit the river sporadically and in low quantities. Due to these factors, we estimate take to be between 1 – 5 individuals for the installation of a SERP erosion mitigation riprap and another 1 – 5 individuals for the removal of SERP erosion mitigation riprap design.

4.1.6 Bigeye Chub

Illinois Department of Natural Resources biologists have sampled extensive populations of Bigeye Chub, both upstream and downstream of the Project area. Catch ranged from zero individuals in 2006 and 2011 at the Middle Fork River Forest Preserve (upstream of Project area), to 71 individuals at Kickapoo State Park (downstream of Project area) and 156 individuals at Kennekuk County Park (upstream of Project area) both in 2016 (Trent Thomas, personal communication on November 8, 2018). Due to the suitable habitat for Bigeye Chub within the Project area, there is a reasonable chance a large population of this species to inhabit this location. Due to these factors, we estimate take to be between 50 – 150 individuals for the installation of a SERP erosion mitigation riprap and another 50 – 150 individuals for the removal of a SERP erosion mitigation riprap.

4.2 MUSSEL RELOCATION

A mussel relocation plan was prepared and submitted to IDNR in July 2019 with the goal of reducing impacts to mussels potentially occurring within the Project area. The mussel relocation plan has been adjusted slightly due to changes in the proposed approach.

Freshwater mussels will be relocated using a moving transect method. Transect lines will be set every two meters across the wetted width of the river within the area of direct impact. Field staff will search 1 meter upstream and 1 meter downstream of each transect line. Each transect line will be extended the entire wetted width of the area of direct impact plus a buffer extending 5 meters offshore. Mussels will be collected and recorded by each transect segment. A minimum effort of 0.3 minutes per meter² will be spent searching for mussels per pass. Successive passes will be made until mussel counts are less than 10 percent of the cumulative total or fewer than three mussels are collected. Mussels will be collected by visual or tactile searches, including moving cobble and woody debris, hand sweeping away silt, sand, and/or small detritus, and disturbing/probing the upper 5 cm (2 in) of substrate. Mussels will be collected in mesh bags and brought to shore for identification and data collection. Mussels will be identified to species level, measured for length, and sexed, where possible. Mussels will be transported upstream to an area of equal or better habitat as quickly and efficiently as practical to minimize handling stress and the associated potential for mortality. Representative specimens will be photographed and spent valves may be retained as vouchers. Special status species, including the mussel species identified in Section 1.2, will be tagged with passive PIT tags to facilitate proposed monitoring (discussed in Section 4.4.2).

During the initial presence/absence survey, Stantec staff identified a site upstream of the construction limits that appears to be a suitable relocation site. This site contained similar mussel assemblage and higher densities than the Project area (Table 2). This location will be re-sampled prior to the salvage and relocation in order to confirm that a



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similar or better assemblage remains extant. Special status taxa will be tagged with PIT tags in order to locate them during monitoring surveys approximately one- and three-years post construction. Non-listed animals will be tagged and/or marked to distinguish resident animals from transplanted individuals in subsequent monitoring events.

Table 2. Proposed Relocation Site Coordinates.

Waterbody	Latitude	Longitude
Middle Fork Vermilion River	40.186796	-87.742874

If erosion monitoring reveals that erosion control structures need to be installed, and a mussel relocation cannot be completed due to time of year, DMG will confer with IDNR regarding next steps.

4.3 PLANS FOR MANAGEMENT OF AREA

The proposed action will allow for the continued use of the impacted area, and improvements in water quality while the aggregate SERP erosion mitigation riprap design is installed. The construction of the SERP erosion mitigation riprap design will stop erosion of the riverbank and the lateral migration in that location while DMG closes the ash ponds. The erosion control activities should have a net benefit to the Project area and downstream through reductions in TSS loads. Once the ash ponds are closed, DMG will remove the SERP erosion mitigation riprap design and allow the riverbank to recover naturally. Riprap removal will be a secondary project.

4.4 MEASURES TO BE IMPLEMENTED TO AVOID, MINIMIZE, AND MITIGATE EFFECTS OF PROPOSED ACTION

4.4.1 Avoidance Measures

Avoidance of threatened and endangered species habitat has been implemented where possible. Construction equipment will work from the top of the riverbank and will not enter the stream, therefore reducing the risk of crushing mussels and increasing the TSS within the water column. The riffle habitat known to contain Bluebreast Darter has been restricted from construction limits as an avoidance measure.

4.4.2 Minimization Measures

An aggregate SERP erosion mitigation riprap design will be installed on an as-needed basis which will reduce the amount of riprap that will be installed below the OHWM. The SERP erosion mitigation riprap design is a maximum of 500 ft in length and a maximum of 2,500 ft² impact area within the streambed. This impact is much smaller than other alternatives for reducing lateral erosion of the riverbank. Banks are unstable and laterally migrating which makes them poor habitat and unlikely to support mussels.

4.4.3 Mitigation Measures

DMG shall provide funding in the amount of \$20,000 to the Illinois Wildlife Preservation Fund earmarked for bringing conservation benefit to the species potentially impacted. This funding shall be provided within 90 days of execution of this agreement. Mitigation payments are nonrefundable, including events of revocation or termination. This mitigation



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value was based on IDNR's best current understanding of the species life history needs and impact analysis relevant to the Project site's proposed conceptual design elements available at the time of review.

4.5 PLANS FOR MONITORING AREA

4.5.1 Erosion Monitoring

As described in Section 3.1.1, the riverbank will be monitored throughout the closure of the ash ponds. The monitoring program was designed to determine when the installation of temporary erosion protection is necessary to install. Monitoring activities consist of 5-ft ground-rods placed in vertical profiles every 25-ft along the riverbank. Three ground rods are placed at each profile: at the bottom of the riverbank, the middle of the riverbank, and top of the riverbank. Ground-rod monitoring is performed monthly and consists of measuring the lateral distance from the tip of the rod to the riverbank. The berms and riverbanks along the OEAP and NAP are also monitored visually on a weekly basis for potential stability issues such as cracking, surface erosion, seeps, etc.

4.5.2 Species Monitoring

After each impact event, DMG will implement a survey within the impact area to assess the mussel and fish species present in Year 1 and Year 3, post-impact. A mussel survey will be conducted using SCUBA or snorkeling as necessary for the depth of water. The fish survey will be conducted using electroshocking methods. The species listed in Section 4.1 will be the target species of these monitoring events. Separate monitoring events will be completed for each impact event; however, they may occur during the same years. Summary reports for each monitoring event will be submitted to IDNR according to permit guidelines. The purpose of these monitoring events is to assess the survival and presence of the species at the 1-year and 3-year points after completion of construction. Fish are expected to colonize the construction area quickly, but mussels may require longer than the proposed monitoring period.

4.5.2.1 Mussel Species

Similar methods to the mussel relocation will be used for monitoring freshwater mussels (i.e., the moving transect method) in both the relocation area and the Project area. Mussels will be collected by visual or tactile searches, including moving cobble and woody debris, hand sweeping away silt, sand, and/or small detritus, and disturbing/probing the upper 5 cm (2 in) of substrate. Mussels will be collected in mesh bags and brought to shore for identification and data collection. Mussels will be identified to species level, measured for length, and sexed, where possible. A PIT tag reader will be onsite and used to locate any tagged mussels from the relocation. Biologists will also record any marking on the common mussel species that signify they were a relocated mussel. Representative specimens will be photographed and spent valves may be retained as vouchers. A report will be written summarizing findings and submitted to the agencies.

4.5.2.2 Fish Species

The fish community will be assessed using a Before-After/Control-Impact design. Sampling before construction will occur every five years at 1.) the Project site, and; 2.) a control site until construction occurs. An appropriate control site will be chosen upstream of the Project site that will be located outside the impacts of construction and be similar in habitat, stream features present, and similar fish assemblage. The length of the control site will be equal to the Project site (i.e., approximately 1,900 linear feet). The control site will also be sampled concurrently with sampling at the Project



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Description of Alternatives

site before construction. Following construction, both sites will be sampled at Year 1 and Year 3, post-construction to assess impacts. This sampling design will allow for the comparison of the fish assemblage response at the Project to construction activities compared to the fish assemblage at an unimpacted site.

Fish sampling during all sampling events and at all sites will consist of electrofishing using a tow-barge. Sampling will occur in an upstream direction and will cover all available habitats. Each electrofishing sampling unit will consist of 15-minute runs until the entire reach has been sampled. Fish will be stunned using an electrofisher and netted out of the water into holding tanks supplied with fresh, aerated water until processing. Care will be taken to reduce holding and handling stress on fishes, including reducing time in holding tanks and processing out of water. All captured fish will be identified to the species level and measured (total length) to the nearest millimeter. Processed fish will be returned to the river downstream of sampling.

4.6 ADAPTIVE MANAGEMENT PRACTICES

Erosion control measures or BMPs will be implemented to minimize sediment runoff during construction such as filter sock or silt fence. These measures will be monitored and adjusted as needed, details in the Stormwater Pollution Prevention Plan. A spill response plan will be developed prior to construction. Construction equipment will be located on the riverbank and all construction will be conducted from the riverbank. Equipment will be removed, in the event of flood conditions. As the rip rap is placed, any rip rap that falls outside of the project area will be collected with the equipment from the riverbank.

4.7 VERIFICATION OF FUNDING

Verification of funding is provided in Appendix D.

5.0 DESCRIPTION OF ALTERNATIVES

Alternative actions were previously examined as part of the design phase for this Project. Five design alternatives (including a no-action alternative) were considered for stabilization of the streambank.

5.1 ALTERNATIVE 1: NO ACTION

- Description: No action.
- Impacts:
 - Erosion would continue to occur along the streambank (at an estimated average rate of 2.3 ft per year), resulting in sedimentation downstream of the Project site, possible eventual failure of gabion baskets, and a reduced width between the Middle Fork Vermilion River and the adjacent embankments. TSS would continue to migrate downstream due to the erosion of the riverbank and water quality could be impacted by the ash ponds. For this reason, this alternative is not preferred.



5.2 ALTERNATIVE 2: STONE TOE WITH LIVE BRANCH LAYERING

- Description: Install riprap scour protection at the toe of slope (keyed into channel bottom) up to the bankfull elevation and install soil lifts wrapped in coir fabric with live branches and other native vegetation above the riprap.
- Impacts:
 - Reduces risk of future toe erosion and associated downstream sedimentation.
 - This treatment is suitable for high stream velocities with erodible soils and has proven to be successful in other similar project settings.
 - Enhances riparian zone functions and provides natural aesthetics once vegetation is established. Proposed native vegetation will be consistent with surrounding area along this section of stream. Vegetation establishment in the live branch layering will typically take up to two growing seasons. Use of containerized trees and shrubs in addition to live stakes and whips can provide more rapid revegetation of the streambank, which once fully established will aid in the erosion mitigation. Once the vegetation establishes, it requires little maintenance.
 - Requires work in the channel during construction.
 - This alternative will require extensive streambed disturbance and an increase in TSS.

5.3 ALTERNATIVE 3: BURIED RIPRAP TRENCH

- Description: Install buried riprap in an excavated trench within the streambank, offset a specified distance from the top of the exposed bank. The toe trench is built such that the base is below the predicted scour depth and extends to a height of the current bankfull flow.
- Impacts:
 - The buried riprap does not provide immediate bank protection or stability; rather, it is intended to become active once the bank has eroded to the location of the riprap. At that time, the rock from the riprap trench acts as a resisting force to erosion of the stream and provides a stable base for the above bank. Sediment between the trench location and existing streambank would therefore be allowed to erode further, resulting in conveyance downstream.
 - Areas with a narrow bench between the Middle Fork Vermilion River and existing embankments are not suitable for this treatment without excavating the embankment.
 - This method would require less disturbance to the stream channel than Alternative 2 (Stone Toe with Live Branch Layering); however, it is only suitable if the stability of adjacent embankments will not be jeopardized during installation.
 - Riparian vegetation will need to be cleared for this work, removing the natural bank stabilization of riparian vegetation. Once the stream bank has eroded to the buried riprap, the banks above the rock toe will be bare, but the rock toe will provide stabilization. Vegetation will then need to be re-established on exposed streambank above the riprap toe.



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Data Indicating Proposed Action Will Not Reduce Survival of Listed Species

5.4 ALTERNATIVE 4: SHEET PILE WALL

- Description: Driving interlocking steel sheet piling along the bank, separating the bank from the stream to prevent exposure of the bank to stream flows.
- Impacts:
 - Provides bank protection to flows with stages below the top of the sheet pile wall. The sheet pile wall becomes an impermeable barrier between the stream and bank and eliminates erosive forces along the bank soil.
 - Once in place, the sheet pile wall offers low maintenance and high flow protection.
 - Placement by precision mechanical means can lead to high construction costs.
 - Installation requires the removal of riparian vegetation.
 - Sheet pile wall has an unnatural look and is inconsistent with the surrounding area along the Middle Fork Vermilion River.

5.5 ALTERNATIVE 5: RIVER RELOCATION

- Description: Relocating the stream involves constructing a new channel to the east of the current channel, pulling the stream away from the property.
- Impacts:
 - The newly constructed channel would provide the benefits of a healthy system ranging from riparian vegetation, bank stabilization, access to the floodplain, and proper pattern and grade control.
 - This is a costly method due to the large amount of design and construction required to develop a new hydrologically stable channel.
 - This alternative would disrupt a significant amount of existing vegetation and require extensive earthwork. With the stream being a National Scenic River, it is unlikely that the necessary permits to perform this work would be attainable.

6.0 DATA INDICATING PROPOSED ACTION WILL NOT REDUCE SURVIVAL OF LISTED SPECIES

Wavyrayed Lampmussel is considered widespread throughout the Vermilion River system but restricted to that basin within Illinois (J. Tiemann, personal communication, November 11, 2018, INHS 2018, Cummings and Mayer 1992). Illinois Natural History Survey's database contains 14 records for Wavyrayed Lampmussel in the Middle Fork Vermilion River, with two records as recent as 2013, despite the few active searches for this particular species. This species is considered globally stable, yet the restriction to the Vermilion River basin in Illinois makes them rare within the state. Six live individuals were found during the September 2018 survey upstream of the proposed Project area (Stantec 2018). Habitat upstream of the Project area was more suitable for Wavyrayed Lampmussel and yielded four individuals during qualitative surveying. Due to the widespread distribution of Wavyrayed Lampmussel throughout the Vermilion



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River basin, and the large amount of suitable habitat (upstream of the Project area), these data indicate that incidental take during this Project will not reduce survival of this listed species.

Northern Riffleshell was likely extirpated from the State of Illinois until recent translocation efforts brought individuals from Pennsylvania to the Middle and Salt Fork Vermilion River (Tiemann et al. 2017). There have been no reports of recruitment among the 1,076 translocated Northern Riffleshell upstream of the Project site. Yearly survival has been estimated at 30% (Stodola et al. 2017). High flow events during summer 2015 were observed to displace translocated mussels downstream, potentially decreasing survival rates. It is highly unlikely that the Project site contains a significant population of live Northern Riffleshell that would impact overall species survival.

Clubshell was also believed extirpated from the State of Illinois until a lone live animal was found in a 1996-1998 survey (Szafoni et al. 2000) and the translocation efforts from Pennsylvania to the Middle and Salt Forks Vermilion River (Tiemann et al. 2017). There have been no reports of recruitment from the 1,420 individuals translocated to the Middle Fork Vermilion River in recent years, although survival from 2012-2014 was high (79%; Stodola et al. 2017). Similar to Northern Riffleshell, high flow events during summer 2015 were observed to displace translocated mussels downstream and potentially decreasing survival rates. It is unlikely that a significant population of live Clubshell inhabits the Project site and, therefore, it is highly unlikely that the proposed Project would impact overall species survival.

A single Bluebreast Darter was observed in the riffle habitat just upstream of the proposed Project area during the September 2017 mussel survey. Recent observations in the Middle Fork Vermilion River by IDNR biologists include four individuals found in 2006, 21 found in 2011, and four found in 2016 in Kickapoo State Park, downstream of the proposed Project site. Tiemann (2008) collected specimens throughout the Vermilion River drainage, and most abundantly within the Middle Fork Vermilion River. Because the construction impacts are not within the preferred habitat of Bluebreast Darter incidental take is highly unlikely. Therefore, the possibility of the proposed action reducing overall survival of the species is also not likely.

Based on information from IDNR, a single Eastern Sand Darter is documented near the Project area; however, IDNR observations suggest that this species is widespread, but sporadic (J. Tiemann, personal communication on November 11, 2018; INHS 2018). This Project should result in a long-term benefit to the species, as decreasing sediment loads has been shown to allow re-expansion to historic norms (Tessler et al. 2012). The small Project area suggest that Eastern Sand Darter survival will not be threatened.

Numerous Bigeye Chub have been recorded throughout the Middle Fork Vermilion River (INHS 2018), suggesting that populations are widespread and abundant. Observations totaling 71 individuals in Kickapoo State Park and 156 individuals in Kennekuk County Park in 2016 show healthy populations exist throughout the region. It is unlikely that impacts from the Project will result in a decline of this species in the Middle Fork Vermilion River.

7.0 IMPLEMENTING AGREEMENT

The implementing agreement can be seen in Appendix D.



8.0 REFERENCES

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APPENDIX A

**Freshwater Mussel Survey on the Middle Fork Vermilion
River at the Illinois Power Company Vermilion Station (River
Mile 8.1)**



Prepared for Vistra Energy

Draft Freshwater Mussel Survey on the Middle Fork Vermillion River at the Illinois Power Company Vermillion Station (River Mile 8.1)

October 24, 2018

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Sign-off Sheet

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Executive Summary

Vistra Energy contracted with Stantec Consulting Services, Inc (Stantec) to conduct a freshwater mussel survey on The Middle Fork Vermilion River in Vermilion County, Illinois. The primary objective of this project was to determine presence or probable absence of special status mussel species within an area proposed for river restoration activities.

The proposed project involves river restoration along approximately 650 meters of the west bank of the Middle Fork Vermilion River. A combination of stone toe protection, embedded toe boulders, void-filled riprap, and live branch layering is being proposed to stabilize a segment of the riverbank on the project site. Existing gabion baskets along the river edge within the central portion of the project will be removed.

The mussel survey was performed on September 16 and 17, 2018. Total search effort was approximately 13.3 person-hours. During this effort 33 live mussels were collected, measured, aged, and sexed. Total live species richness was eight, with an additional 16 species represented by spent shells. All mussels were replaced back into the substrate in the approximate area they were found. The most abundant live species were *Lampsilis cardium* (Plain Pocketbook; n=11), *Lampsilis siloquoidea* (Fatmucket; n=9), and *Lampsilis fasciola* (Wavyrayed Lampmussel; n=6). Special status species found during the survey include live and shell specimens of *L. fasciola* (Illinois Endangered) and shells of *Epioblasma rangiana* (Northern riffleshell, Illinois and Federal Endangered). Field personnel also collected shells for the following Illinois listed species: *Villosa lienosa* (Little Spectaclecase, n=1), *Alasmidonta viridis* (Slippershell, n=1), *Ptychobranthus fasciolaris* (Kidneyshell, n=1), and *Cyclonaias tuberculata* (Purple Wartyback, n=1).

Abbreviations

°C	Degrees Celsius
CPUE	Catch per unit effort
cm	Centimeters
ft	Feet
hr	Hour
IDNR	Illinois Department of Natural Resources
INHS	Illinois Natural History Survey
In	Inch
m	Meter
m ²	Square Meter
mm	Millimeters
mg/L	Milligram per Liter
µS	Microsiemens
NTU	Nephelometric Turbidity Unit
SCUBA	Self-contained Underwater Breathing Apparatus
USFWS	U. S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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1.0 INTRODUCTION

1.1 PROPOSED PROJECT

Vistra Energy seeks to conduct bank stabilization activities along the Middle Fork Vermilion River (HUC 05120109), which is listed as a nationally-designated scenic river near Oakwood, Illinois for 17.1 miles, including the project area. This project consists of stabilizing approximately 650m of the right descending riverbank. The design includes the utilization of stone toe protection (a combination of 24" boulders and void-filled riprap) and live branch layering. The proposed planting plan will include a variety of native species that once established will give this project a consistent appearance with the native landscape. The mussel survey area consisted of 26 transects spread evenly throughout 1,050m of streambank, running from the western bank to the midpoint of the river (Appendix A). This survey also consisted of three 2-hour qualitative timed searches of suitable habitat areas.

1.2 PROJECT SETTING

The Middle Fork Vermilion River at the project site has an approximate drainage area of 425 square miles (Table 1). The survey area is located north of Kickapoo State Recreation Area on the Middle Fork Vermilion River, west of Danville, Illinois and can be found on the Danville NW, Illinois U.S. Geological Survey (USGS) 7.5-minute series topographic map. The project area sits within the Glaciated Wabash Lowlands, which is characterized by till plains with rugged ravines, floodplains, and terraces. This terrain and associated conditions create the gravel bottoms and riffles associated with the Vermilion River system (USEPA 2018).

Table 1. Survey Site Location

Site	Latitude	Longitude
Middle Fork Vermilion Downstream Survey Extent	40.18113	-87.73941
Middle Fork Vermilion Upstream Survey Extent	40.18627	-87.74273

1.3 LISTED FRESHWATER MUSSEL DISTRIBUTION

Streams within Vermilion County, Illinois are host to at least three federally endangered, along with eight state endangered and four state threatened mussel species (Table 2). Some of these species were extirpated or became extremely rare, leading to Illinois Natural History Survey (INHS) translocating 686 *Epioblasma rangiana* (Northern Riffleshell) and 730 *Pleurobema clava*

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(Clubshell) between 2013-2014 from Pennsylvania to four sites on the Middle Fork Vermilion River, all of which are upstream of the project area (Stodola et al. 2017). An additional 680 *P. clava* and 500 *E. rangiana* were translocated INHS in 2016, for a total of 1,420 *P. clava* and 1,186 *E. rangiana* translocated into habitat upstream of the project area (Tieman et al. 2016). High flow events have been shown to displace these translocated populations and transport them downstream (Stodola et al. 2017). No critical habitat has been designated for *E. rangiana* or *P. clava*. *Quadrula cylindrica* (Rabbitsfoot) critical habitat consists of 28.5km of habitat on the North Fork Vermilion River and Middle Branch North Fork Vermilion River.

While monitoring of these populations has taken place, no specific surveying within the project area has been completed. Surveys conducted in 2013 (prior to any translocations) examined sites upstream and downstream of the project area, finding shells of *Lampsilis fasciola* (Wavyrayed Lampmussel) in both directions (Stodola et al. 2013). *Pleurobema clava* has historic localities upstream of the project site, but has been considered extirpated from the Middle Fork Vermilion for 40 years. *Epioblasma rangiana* has not been observed naturally in the Middle Fork Vermilion in over 70 years and before translocations the species was considered extirpated (Cummings et al. 1998). In 2013 relict shells of *Q. cylindrica* were found in the Middle Fork Vermilion upstream of the project area, as well as live individuals at three sites in the North Fork Vermilion River (Stodola et al. 2013).

Table 2. Listing status of freshwater mussel species with historic records in Vermilion County, Illinois (Illinois Natural Heritage Database, 2018)

Scientific name	Common Name	State Status	Federal Status
<i>Alasmodonta viridis</i>	Slippershell	Threatened	-
<i>Cycolonaias tuberculata</i>	Purple Wartyback	Threatened	-
<i>Epioblasma rangiana</i>	Northern Riffleshell	Endangered	Endangered
<i>Lampsilis fasciola</i>	Wavyrayed Lampmussel	Endangered	-
<i>Ligumia recta</i>	Black Sandshell	Threatened	-
<i>Pleurobema clava</i>	Clubshell	Endangered	Endangered
<i>Ptychobranhus fasciolaris</i>	Kidneyshell	Endangered	-
<i>Quadrula cylindrica</i>	Rabbitsfoot	Endangered	Endangered
<i>Simpsonaias ambigua</i>	Salamander Mussel	Endangered	-
<i>Toxolasma lividus</i>	Purple Lilliput	Endangered	-
<i>Villosa iris</i>	Rainbow	Endangered	-
<i>Villosa lienosa</i>	Little Spectaclecase	Threatened	-

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2.0 METHODS

2.1 FIELD SURVEYS

The mussel survey was performed on September 16 and 17, 2018. Total search effort consisted of 13.3 person-hours of surveying. The survey area was composed of 1,050m of river, with surveys occurring along 26 transects spread evenly throughout the river reach. Each transect extended from the edge of the water on the west bank to the midpoint of the river. Surveying consisted of one minute per meter of transect length, with surveyors examining approximately one meter upstream and downstream of the transect. Each transect was separated into, at most, 10m long segments. Data was reported for each individual segment. In addition to transects, three 2-hour qualitative surveys in optimal habitat were conducted following transect surveys. These methods were approved by USFWS and IDNR (Appendix B).

Mussels were collected by visual and tactile searches, including moving cobble and woody debris, hand sweeping away silt, sand, and/or small detritus, and disturbing/probing the upper five centimeters (two inches) of substrate. SCUBA was used for areas with depths greater than 0.5m, and snorkeling was done in area's with depths <0.5m. All live mussels were placed in mesh bags and brought to shore for identification and data collection. Species identification and processing was completed by a federal and state permitted (Appendix C) malacologist. Following processing, mussels were returned to the approximate locations of capture. Spent shells were collected during incidental surveying by support staff and in between transect surveys. No live animals were retained during field surveys.

Water samples were taken prior to field surveys each day. Conductivity, pH, and water temperature were taken with a Hanna HI98130 handheld unit. Dissolved oxygen readings were taken with a Yellow Springs Instruments (YSI) 500A handheld unit. Turbidity was measured using a Hach turbidimeter.

2.2 ANALYTICAL METHODS

Assemblage composition was assessed using simple metrics such as relative abundance, catch per unit effort (CPUE), and species richness. Population structure was assessed by plotting individual lengths and growth ring counts for evidence of reproduction and recruitment.

3.0 RESULTS

3.1 SITE CONDITIONS

Flow conditions in the Middle Fork Vermilion River were suitable for surveying September 16-17, 2018 (Figure 1). Turbidity was relatively low throughout the survey period, with visibility >1 meter for

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the entirety of the survey. Average water depth was approximately 1 meter (3ft), with the maximum being ~2 meters (6ft). All measured water quality parameters stayed relatively constant throughout the survey period (Table 3).

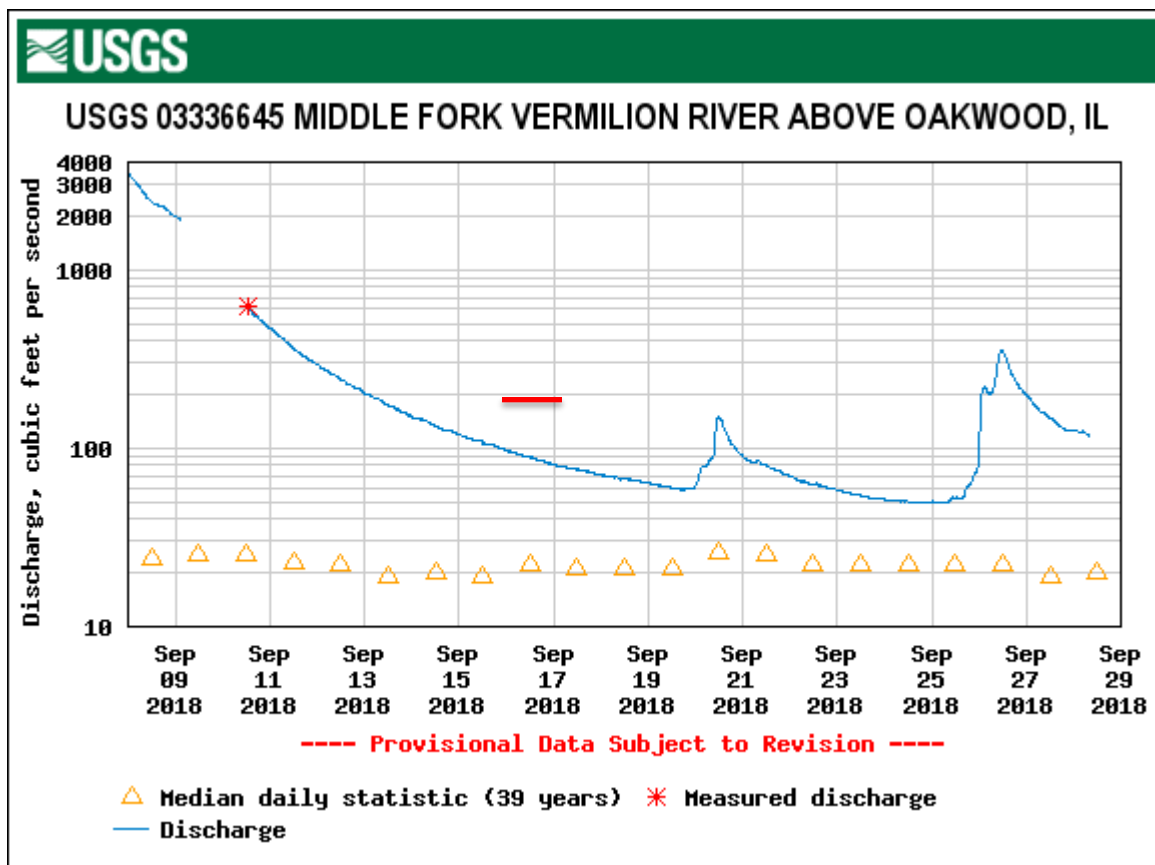


Figure 1. Discharge on the Middle Fork Vermilion River at USGS Gauge 03336645 Above Oakwood, Illinois During the Freshwater Mussel Survey on September 16-17, 2018

Table 3. Water Quality Parameters for the Middle Fork Vermilion River During the Freshwater Mussel Survey on September 16-17, 2018

Date	Water Temperature (°C) ¹	% Oxygen Saturation	Dissolved Oxygen (mg/L) ²	Turbidity (NTU) ³	Specific Conductivity (µS) ⁴	pH
9/16/2018	22.4	89.7	7.89	19	674	8.75
9/17/2018	22.9	87.5	7.57	17	685	8.45

¹Degrees Celsius

³Nephelometric turbidity units

²Milligrams per liter

⁴Microsiemens

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The project area contained multiple distinct habitat types (Site photos in Appendix D). Transects 1-9 were generally similar, being on the depositional bank of a point bar, displaying approximately 40 percent coarse gravel, 40 percent small gravel, and 20 percent sand. The exposed point bar held high concentrations of uneroded sand.

Transects 10-19 were along the eroding west bank, exhibiting similar characteristics. Multiple seeps were located within this section of riverbank in addition to gabion baskets in varying states of disrepair (Appendix C). Substrate consisted of riprap, cobble, and hardpan near the edge of the bank, with sporadic flow refuges full of small gravel and sand. Towards the midpoint of the river there was more sand/small gravel mixtures as the dominant substrate. The area along this bank was the deepest portion of the river, with depths of approximately 2m.

The area between transects 20-21 was a cobble riffle system, with a steep slope and larger cobble and boulders.

Transects 22-26 were similar to transects 1-9, again exhibiting characteristics of a depositional bar, with loose sand and small gravel comprising the majority of substrate, with some sporadic boulders and cobbles. Qualitative surveys upstream of transect 26 were in deeper habitat (approximately 1-2m deep) with larger substrate, approximately 40 percent cobble, 40 percent gravel, and 20 percent sand/silt.

Also of note was the sighting of *Etheostoma camurum* (Bluebreast Darter) within the riffle area of transect 22. This fish is a state endangered species in Illinois, and occupies fast flowing, clear riffles like those seen in transect 22, upstream of transect 26, and approximately 200m downstream of transect 1.

Additional fish seen within the project site during SCUBA and snorkel surveys include: *Etheostoma caeruleum* (Rainbow Darter), *Etheostoma flabellare* (Fantail Darter), *Micropterus dolomieu* (Smallmouth Bass), *Nocomis biguttatus* (Hornyhead Chub), *Lepomis megalotis* (Longear sunfish), and *Etheostoma sciera* (Dusky Darter). Photos can be seen in Appendix C.

3.2 MUSSEL DISTRIBUTION AND ABUNDANCE

3.2.1 Species composition

A total of 33 live mussels were collected from the salvage areas, comprising 8 species (Table 4). All eight species were found after 11 search hours, with no additional species being found during the final 2.3 search hours (Figure 2). The most abundant live species were *Lampsilis cardium* (Plain Pocketbook; n=11), *Lampsilis siloquoidea* (Fatmucket; n=9), and *L. fasciola* (n=6). Other species collected during the mussel relocation included *Anodontoides ferrusacianus* (Cylindrical Papershell; n=3), *Fusconaia flava* (Wabash Pigtoe; n=1), *Lasmigona costata* (Flutedshell; n=1), *Pyganodon grandis* (Giant Floater; n=1), *Cyclonaias pustulosa* (Wartyback; n=1).

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Species represented solely by spent shell specimen included *Alasmidonta marginata* (Elktoe), *Amblema plicata* (Threeridge), *Alasmidonta viridis* (Slippershell), *Cyclonaias tuberculata* (Purple Wartyback), *Eurynia dilatata* (Spike), *E. rangiana*, *Lasmigona complanata* (White Heelsplitter), *Obovaria subrotunda* (Round Hickorynut), *Potamilus alatus* (Pink Heelsplitter), *Ptychobranthus fasciolaris* (Kidneyshell), *Pleurobema sintoxia* (Round Pigtoe), *Quadrula quadrula* (Mapleleaf), *Strophitus undulatus* (Creeper), *Tritogonia verrucosa* (Pistolgrip), *Villosa iris* (Rainbow), *Villosa lienosa* (Little Spectaclecase) (Table 4). Spent shell specimens of note include the two *E. rangiana*, a Federally Endangered species, numerous *L. fasciola* (State Endangered), a single *P. fasciolaris* (State Endangered) and single shells of *A. viridis*, *C. tuberculata*, and *V. lienosa* (All State Threatened).

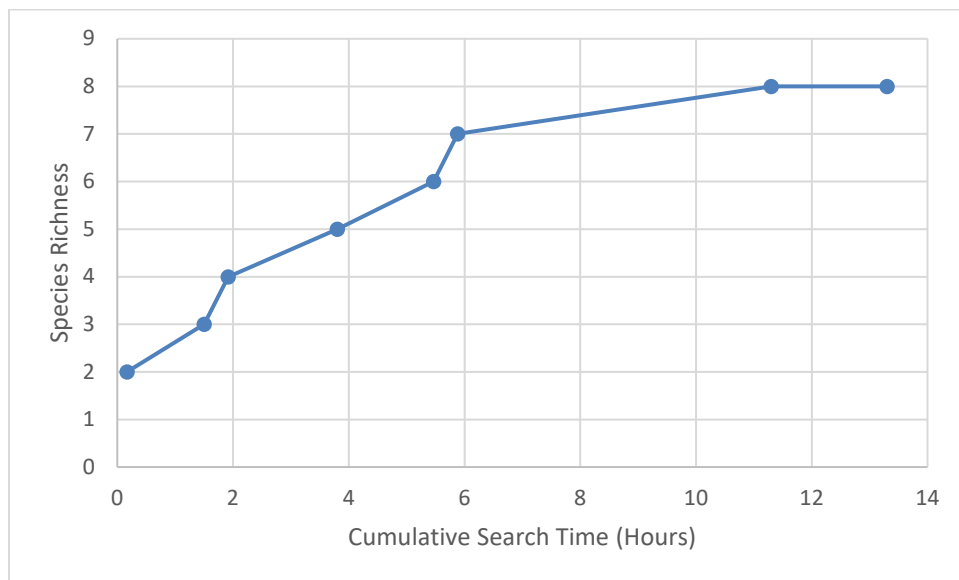


Figure 2. Cumulative Species Richness as a Function of Search Time on the Middle Fork Vermilion River, Vermilion County, Illinois

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Table 4. Live and Spent Shell Totals for Freshwater Mussel Survey on Middle Fork Vermilion River, Vermilion County, Illinois

Common Name	Scientific Name	Live	Fresh Dead	Weathered	Subfossil	Total
Cylindrical Papershell	<i>A. ferussacianus</i>	3	-	2	-	5
Elktoe	<i>A. marginata</i>	-	-	-	3	3
Threeridge	<i>A. plicata</i>	-	-	-	6	6
Slippershell	<i>A. viridis</i>	-	-	-	1	1
Wartyback	<i>C. pustulosa</i>	1	-	-	2	3
Purple Wartyback	<i>C. tuberculata</i>	-	-	1	-	1
Spike	<i>E. dilatata</i>	-	-	-	1	1
Northern Riffleshell	<i>E. rangiana</i>	-	-	1	-	1
Wabash Pigtoe	<i>F. flava</i>	1	-	8	3	12
Plain Pocketbook	<i>L. cardium</i>	11	-	8	40	59
White Heelsplitter	<i>L. complanata</i>	-	-	-	1	1
Flutedshell	<i>L. costata</i>	1	-	-	7	8
Wavy-Rayd Lampmussel	<i>L. fasciola</i>	6	-	3	3	12
Fatmucket	<i>L. siloquoidea</i>	9	-	6	30	45
Round Hickorynut	<i>O. subrotunda</i>	-	-	-	1	1
Pink Heelsplitter	<i>P. alatus</i>	-	-	-	1	1
Kidneyshell	<i>P. fasciolaris</i>	-	-	-	1	1
Giant Floater	<i>P. grandis</i>	1	-	1	1	3
Round Pigtoe	<i>P. sintoxia</i>	-	-	-	1	1
Mapleleaf	<i>Q. quadrula</i>	-	-	-	1	1
Creeper	<i>S. undulatus</i>	-	-	1	3	4
Pistolgrip	<i>T. verrucosa</i>	-	-	-	1	1
Rainbow	<i>V. iris</i>	-	-	1	-	1
Little Spectaclecase	<i>V. lienosa</i>	-	-	-	1	1
Grand Total		33	0	32	108	173

*Condition as defined by ODNr and USFWS 2016

3.2.1.1 Relative Abundance and CPUE

The survey area was searched for a total of 13.3 person-hours. Live mussels or shells were found in 23 of 42 transect segments during 7.23 hours of searching. Eleven live mussels were found in 7 of 42 segments. CPUE during transect searches was 1.52 live mussels per person-hour, resulting in a species richness of seven. Live mussels were collected in each of three 2-hour qualitative searches

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totaling 6.06 person-hours of surveying. CPUE for the qualitative was 3.63 mussels per hour. The three *Lampsiline* species comprised 79 percent of the total live mussel catch. In addition, *L. cardium* spent shells were extremely abundant (40 counted) along the exposed riverbanks. The State Endangered *L. fasciola* represented 18 percent of live mussels.

Four live mussels were found in transects 1-9, with two being in deep gravel that formed in the thalweg of transect 1. The other two live mussels were found in the gravel bar area along transects 5 and 7 respectively. Five mussels were found in transects 10-19, mainly within small flow refuges created by spilled gabion basket rip rap and boulders. Only two mussels were found in transects 20-26, both also within abnormal flow refuges uncharacteristic of the majority habitat.

3.2.1.2 Age Distribution, Reproduction, and Recruitment

A gravid female *L. fasciola* was seen displaying a lure along with exposed gravid marsupial pouches, indicating local reproduction (Appendix E). A gravid female *L. siloquoidea* was also sighted, releasing glochidia upon removal from the substrate. Despite low overall abundances, length and age (growth lines) distributions show multiple age classes for *A. ferussacianus*, *L. cardium*, *L. fasciola*, and *L. siloquoidea*, indicating local recruitment (Figure 3 & 4).

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

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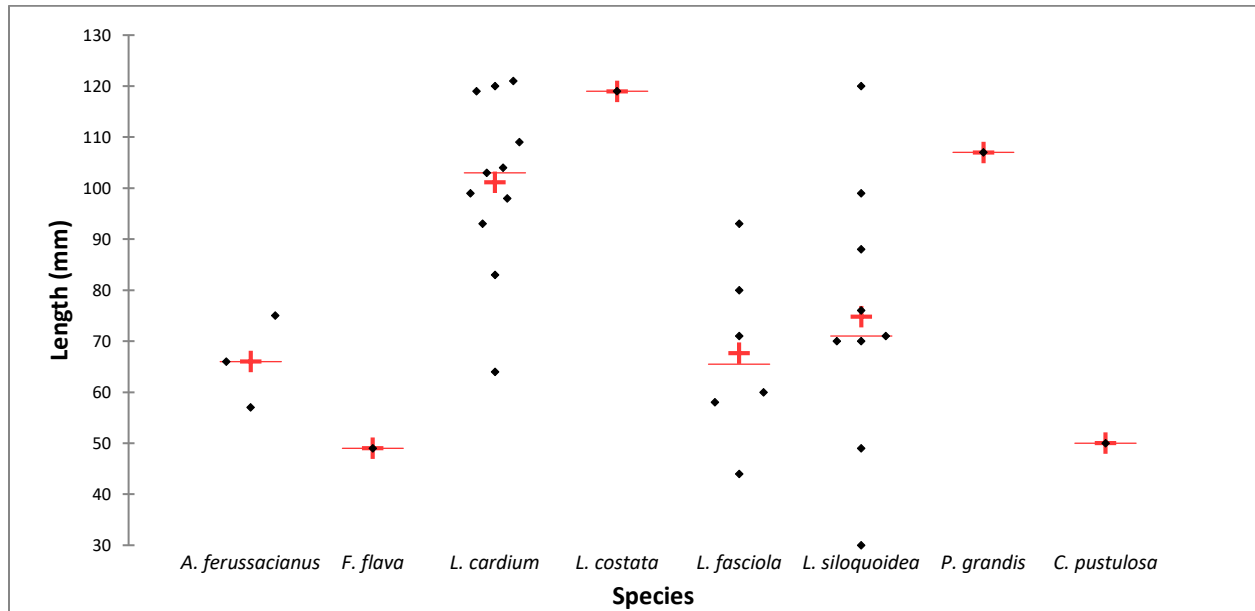


Figure 3. Length Scattergram for Live Mussels Found during Middle Fork Vermilion River Mussel Survey, Vermilion County, Illinois

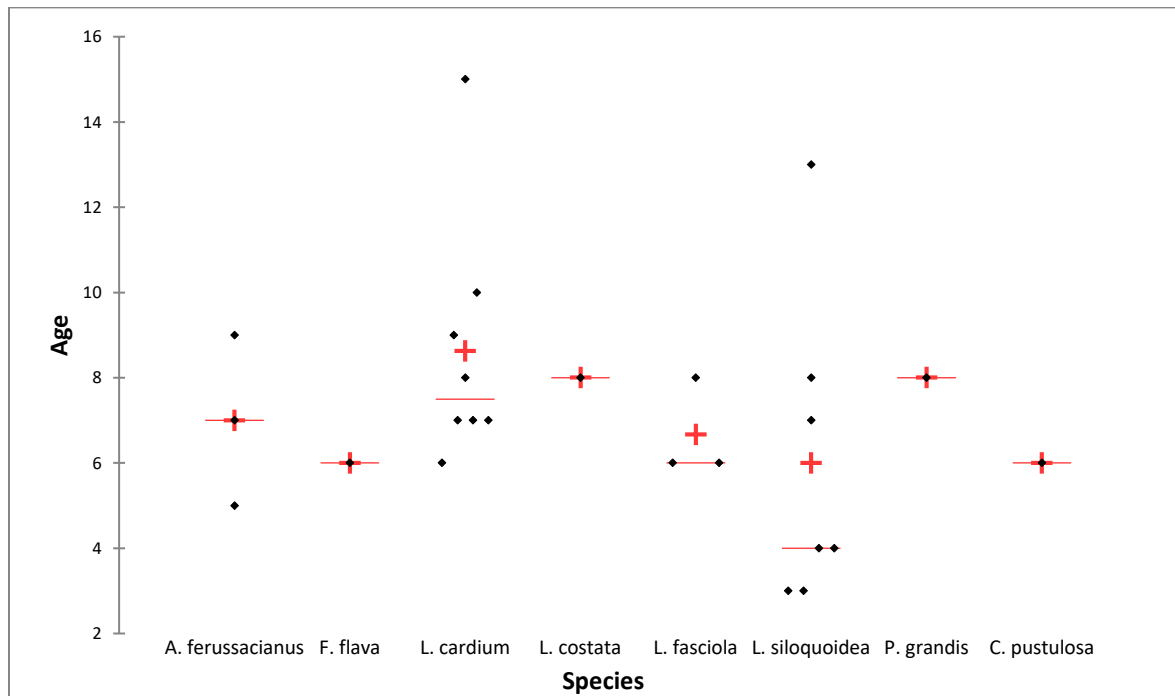


Figure 4. Age Scattergram Based on Growth Rings for Live Mussels Found during Middle Fork Vermilion River Mussel Survey, Vermilion County, Illinois

October 24, 2018

4.0 SUMMARY OF FINDINGS

The mussel survey was performed on September 16 and 17, 2018. Total search effort was approximately 13.3 person-hours. During this effort 33 live mussels were collected, measured, aged, and sexed. Total live species richness was eight. An additional 16 species were represented by spent shells. The most abundant live species were *L. cardium* (n=11), *L. siloquoidea* (n=9), and *L. fasciola* (n=6). Special status species found during the survey include live and shell specimens of *L. fasciola* (Illinois Endangered), shells of *E. rangiana* (Illinois and Federal Endangered), one shell of *V. lienosa* (Illinois Threatened), one shell of *A. viridis* (Illinois Threatened), one shell of *P. fasciolaris* (Illinois Endangered), and shells of *C. tuberculata* (Illinois Threatened).

5.0 DISCUSSION

Relatively low CPUE's were obtained during transect surveying (1.52/hr vs. 3.63/hr) compared to habitat targeted qualitative surveys. The sporadic nature of suitable mussel habitat in the shifting riverbed led to the higher CPUE's in the habitat targeted qualitative surveys. Despite low overall abundances, the Illinois Endangered *L. fasciola* represented a large portion of the local community (Table 4). Multiple age classes as well as evidence of active reproduction indicate a healthy population of *L. fasciola* in the area.

The live species richness of eight compared to the total species richness (shells and live) of 24 indicates that areas not searched during this survey can hold more diverse assemblages, or that communities upstream are much more diverse. On the other hand, the greater abundance of subfossil (n=108) to weathered (n=32) shells may indicate that stressors (geomorphic instability, water quality, etc) may have impacted local fauna. Some species of mussel are more susceptible to stressors than others and many of the live species found are more tolerant of water quality and substrate changes.

The two individual shells of *E. rangiana* indicate movement from areas of prior translocation by INHS (Tiemann et al. 2017). The presence of these shells does not necessarily indicate live populations within the project area, as shells could have drifted downstream post-mortality. *E. rangiana* has been shown to have lower survivorship following translocation relative to other endangered species (*Pleurobema clava*) (Stodola et al. 2017). The tagged individual (#1383, Appendix D) was translocated from Pennsylvania by INHS in 2014 approximately 4km upstream of where it was located during this survey (Tiemann 2018). Due to flooding in the Middle Fork Vermilion River, numerous live and dead *E. rangiana* have been found downstream of the original translocation sites (Stodola et al. 2017). The untagged *E. rangiana* shell is not believed to be an Illinois native, but instead a Pennsylvania transplant that has lost its shell (Tiemann 2018). The wear on the shell and age indicate that it is not a recruit from translocated individuals.

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Fish provide an important link in the freshwater mussel life cycle as an obligate host to the parasitic larval glochidia stage. *E. camurum*, and *E. caerulum* are both reported as hosts for *E. rangiana* glochidia (Watters 1996, O'Dee & Watters 2000, McNichols 2007). *M. dolomieu* and *L. megalotis* were reported as host fish for *L. fasciola* (Zale & Neves 1982, Watters 2009). No known fish hosts for *P. clava* were observed, but it should be noted that fish were only inventoried based on incidental observation. These other fish observations indicate that conditions are favorable for the parasitic stage of both *E. rangiana* and *L. fasciola* glochidia.

The occurrence of live *L. fasciola* requires the acquisition of an Illinois Incidental Take Permit prior to any further impacts to the mussel community within the project area. This process involves the creation and public dissemination of a Conservation Plan relative to the impacts expected on state listed species. The sighting of state endangered *E. camurum* will require a similar Incidental Take Permit and Conservation Plan. The collection of shell specimens of *E. rangiana* was reported to USFWS (as required by Stantec's Federal Recovery Permit) and may require a separate incidental take authorization from USFWS under Section 7 of the Endangered Species Act.

October 24, 2018

6.0 REFERENCES

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Zale, A. V., & Neves, R. J. (1982). Fish hosts of four species of lampsiline mussels (Mollusca: Unionidae) in Big Moccasin Creek, Virginia. *Canadian Journal of Zoology*, 60(11), 2535-2542.

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018

Appendix A AGENCY CORRESPONDENCE

From: Grider, Nathan
To: [Fleece, Cody](#); [Symonds, Daniel](#); [McClelland, Michael](#); [Stephenson, Dan](#)
Cc: [Hoy, Matthew](#); [Peyton, Scott](#); [Sridhar, Paul](#); phil.morris@vistraenergy.com; Matthew.Mangan@fws.gov; kristen_lundh@fws.gov; [Metzke, Brian](#); [Thomas, Trent](#); [Rawe, Adam](#); [Kath, Joe](#); [Rogers, Nancy S](#); Victor.Modeer@vistraenergy.com; [Hayes, Bradley](#); [Yockey, Louis](#); [Cattoor, Wes](#); [Heavisides, Tom](#)
Subject: RE: Middle Fork Vermilion River Freshwater Mussel Survey Study Plan - Vistra Energy River Stabilization Project
Date: Friday, August 31, 2018 4:27:02 PM
Attachments: [sp_07162018_v5.pdf](#)

Hi Cody,

IDNR concurs with the proposed survey as indicated in the attached revised plan for the Vistra Energy river stabilization project. We look forward to the results of the survey at your earliest convenience. My understanding is you already have a general scientific collectors permit from IDNR for this work and your T&E permit has been applied for and is in process, if not executed already.

IDNR, Fisheries: Please execute a salvage authorization for Stantec to relocate all non-listed freshwater mussels from the project impact area to upstream suitable habitat areas beyond the 100 meter buffer area. If state or federally-listed mussels are found, they will be placed back as close as possible to where they were found and IDNR, Consultation and USFWS will discuss any need for ITA with Stantec after the final survey results are received.

Please let us know if you have any questions or concerns as the survey effort commences.

Thank you!

Nathan Grider

Assistant Manager, Consultation Services

Office of Realty & Capital Planning

Illinois Dept. of Natural Resources

One Natural Resources Way

Springfield, IL 62702-1271

nathan.grider@illinois.gov

Phone: (217) 557-0483

Cell: (217) 836-7545

From: Fleece, Cody <Cody.Fleece@stantec.com>

Sent: Friday, August 31, 2018 10:59 AM

To: Grider, Nathan <Nathan.Grider@Illinois.gov>; Symonds, Daniel <Daniel.Symonds@stantec.com>

Cc: Hoy, Matthew <Matthew.Hoy@stantec.com>; Peyton, Scott <Scott.Peyton@stantec.com>; Sridhar, Paul <Paul.Sridhar@stantec.com>; phil.morris@vistraenergy.com; Matthew.Mangan@fws.gov; kristen_lundh@fws.gov; Metzke, Brian <Brian.Metzke@Illinois.gov>; McClelland, Michael <Michael.McClelland@illinois.gov>; Thomas, Trent <Trent.Thomas@Illinois.gov>; Rawe, Adam <Adam.Rawe@illinois.gov>; Stephenson, Dan <Dan.Stephenson@Illinois.gov>; Kath, Joe <Joe.Kath@Illinois.gov>; Rogers, Nancy S <Nancy.S.Rogers@Illinois.gov>; Victor.Modeer@vistraenergy.com; Hayes, Bradley

<Bradley.Hayes@illinois.gov>

Subject: [External] RE: Middle Fork Vermilion River Freshwater Mussel Survey Study Plan

Nathan

Please see our revised study plan.

Let me know if you have questions, comments, or concerns.

Thanks for your time and attention

Cody

513-262-3994

From: Grider, Nathan <Nathan.Grider@Illinois.gov>

Sent: Wednesday, August 29, 2018 3:52 PM

To: Fleece, Cody <Cody.Fleece@stantec.com>; Symonds, Daniel <Daniel.Symonds@stantec.com>

Cc: Hoy, Matthew <Matthew.Hoy@stantec.com>; Peyton, Scott <Scott.Peyton@stantec.com>;

Sridhar, Paul <Paul.Sridhar@stantec.com>; phil.morris@vistraenergy.com;

Matthew_Mangan@fws.gov; kristen_lundh@fws.gov; Metzke, Brian <Brian.Metzke@Illinois.gov>;

McClelland, Michael <Michael.McClelland@illinois.gov>; Thomas, Trent

<Trent.Thomas@Illinois.gov>; Rawe, Adam <Adam.Rawe@illinois.gov>; Stephenson, Dan

<Dan.Stephenson@Illinois.gov>; Kath, Joe <Joe.Kath@Illinois.gov>; Rogers, Nancy S

<Nancy.S.Rogers@Illinois.gov>; Victor.Modeer@vistraenergy.com; Hayes, Bradley

<Bradley.Hayes@illinois.gov>

Subject: RE: Middle Fork Vermilion River Freshwater Mussel Survey Study Plan

Hi Cody,

I discussed the proposed change with our staff and we think the current proposal with our suggested modifications per the email below on 8/24/18 will provide the best coverage of the area and ability to detect rare species. Thus, we do not concur with switching away from the transect method to qualitative timed searches.

Please let me know if you have further questions or concerns.

Thank you!

Nathan Grider

Assistant Manager, Consultation Services

Office of Realty & Capital Planning

Illinois Dept. of Natural Resources

One Natural Resources Way

Springfield, IL 62702-1271

nathan.grider@illinois.gov

Phone: (217) 557-0483

Cell: (217) 836-7545

From: Fleece, Cody [<mailto:Cody.Fleece@stantec.com>]

Sent: Wednesday, August 29, 2018 6:25 AM

To: Grider, Nathan <Nathan.Grider@Illinois.gov>; Symonds, Daniel <Daniel.Symonds@stantec.com>

Cc: Hoy, Matthew <Matthew.Hoy@stantec.com>; Peyton, Scott <Scott.Peyton@stantec.com>; Sridhar, Paul <Paul.Sridhar@stantec.com>; phil.morris@vistraenergy.com; Matthew_Mangan@fws.gov; kristen_lundh@fws.gov; Metzke, Brian <Brian.Metzke@Illinois.gov>; McClelland, Michael <Michael.McClelland@illinois.gov>; Thomas, Trent <Trent.Thomas@Illinois.gov>; Rawe, Adam <Adam.Rawe@illinois.gov>; Stephenson, Dan <Dan.Stephenson@Illinois.gov>; Kath, Joe <Joe.Kath@Illinois.gov>; Rogers, Nancy S <Nancy.S.Rogers@Illinois.gov>; Victor.Modeer@vistraenergy.com

Subject: [External] RE: Middle Fork Vermilion River Freshwater Mussel Survey Study Plan

Nathan

Thanks for taking time to discuss our proposed study plan. I am writing to propose modifications to the sample design you proposed below. As we discussed on the phone, I think we might be more productive if we switched away from the transect method to qualitative sampling (e.g., timed searches) given the relative small size of the stream. Instead we propose to divide the stream into 100 meter reaches for a total of seven in the direct disturbance area. One reach will be placed upstream of the project reach and two will be placed downstream. Two hour timed searches will be conducted in each reach. If state or federally listed taxa are detected we will conduct quantitative sampling in the highest quality habitats. A minimum of twenty quadrats will be excavated in each search area where special status taxa are detected.

If these changes are acceptable to you we will revise the study plan and submit it for your approval.

Thanks for your time and attention.

Cody

From: Grider, Nathan <Nathan.Grider@Illinois.gov>

Sent: Monday, August 27, 2018 10:16 AM

To: Fleece, Cody <Cody.Fleece@stantec.com>; Symonds, Daniel <Daniel.Symonds@stantec.com>

Cc: Hoy, Matthew <Matthew.Hoy@stantec.com>; Peyton, Scott <Scott.Peyton@stantec.com>; Sridhar, Paul <Paul.Sridhar@stantec.com>; victor.modder@vistraenergy.com; phil.morris@vistraenergy.com; Matthew_Mangan@fws.gov; kristen_lundh@fws.gov; Metzke, Brian <Brian.Metzke@Illinois.gov>; McClelland, Michael <Michael.McClelland@illinois.gov>; Thomas, Trent <Trent.Thomas@Illinois.gov>; Rawe, Adam <Adam.Rawe@illinois.gov>; Stephenson, Dan <Dan.Stephenson@Illinois.gov>; Kath, Joe <Joe.Kath@Illinois.gov>; Rogers, Nancy S <Nancy.S.Rogers@Illinois.gov>

Subject: RE: Middle Fork Vermilion River Freshwater Mussel Survey Study Plan

Hi Cody,

We are proposing the qualitative effort in addition to the transects and quantitative effort. Let me know if you have further questions or need further clarification.

Thanks
Nathan Grider
Assistant Manager, Consultation Services
Office of Realty & Capital Planning
Illinois Dept. of Natural Resources
One Natural Resources Way
Springfield, IL 62702-1271
nathan.grider@illinois.gov
Phone: (217) 557-0483
Cell: (217) 836-7545

From: Fleece, Cody [<mailto:Cody.Fleece@stantec.com>]
Sent: Friday, August 24, 2018 7:31 PM
To: Grider, Nathan <Nathan.Grider@Illinois.gov>; Symonds, Daniel <Daniel.Symonds@stantec.com>
Cc: Hoy, Matthew <Matthew.Hoy@stantec.com>; Peyton, Scott <Scott.Peyton@stantec.com>;
Sridhar, Paul <Paul.Sridhar@stantec.com>; victor.modder@vistraenergy.com;
phil.morris@vistraenergy.com; Matthew_Mangan@fws.gov; kristen_lundh@fws.gov; Metzke, Brian
<Brian.Metzke@Illinois.gov>; McClelland, Michael <Michael.McClelland@illinois.gov>; Thomas,
Trent <Trent.Thomas@Illinois.gov>; Rawe, Adam <Adam.Rawe@illinois.gov>; Stephenson, Dan
<Dan.Stephenson@Illinois.gov>; Kath, Joe <Joe.Kath@Illinois.gov>; Rogers, Nancy S
<Nancy.S.Rogers@Illinois.gov>
Subject: [External] RE: Middle Fork Vermilion River Freshwater Mussel Survey Study Plan

Nathan

Thanks for your feedback. Most of the requested modifications will be easily incorporated.

One quick question – we proposed to conduct quantitative sampling if a density trigger was exceeded. You proposed qualitative sampling in your prior message. Was qualitative sampling proposed as “in addition to” or “in lieu” of quantitative sampling?

Thank you!

Cody

From: Grider, Nathan <Nathan.Grider@Illinois.gov>
Sent: Friday, August 24, 2018 4:59 PM
To: Symonds, Daniel <Daniel.Symonds@stantec.com>
Cc: Fleece, Cody <Cody.Fleece@stantec.com>; Hoy, Matthew <Matthew.Hoy@stantec.com>;
Peyton, Scott <Scott.Peyton@stantec.com>; Sridhar, Paul <Paul.Sridhar@stantec.com>;
victor.modder@vistraenergy.com; phil.morris@vistraenergy.com; Matthew_Mangan@fws.gov;
kristen_lundh@fws.gov; Metzke, Brian <Brian.Metzke@Illinois.gov>; McClelland, Michael
<Michael.McClelland@illinois.gov>; Thomas, Trent <Trent.Thomas@Illinois.gov>; Rawe, Adam
<Adam.Rawe@illinois.gov>; Stephenson, Dan <Dan.Stephenson@Illinois.gov>; Kath, Joe

<Joe.Kath@Illinois.gov>; Rogers, Nancy S <Nancy.S.Rogers@Illinois.gov>

Subject: RE: Middle Fork Vermilion River Freshwater Mussel Survey Study Plan

Hello Mr. Symonds,

Thank you for providing the survey proposal for our review. We have gathered and condensed comments internally and provide them below:

1. You will need a valid Scientific Collector permit and permit to 'potentially' handle T&E species issued by IDNR. Perhaps you already have one and I missed it in the proposal? If not, you can apply for them here:
<https://www.dnr.illinois.gov/conservation/NaturalHeritage/Pages/ResearchPermits.aspx>
2. We will need to issue a salvage authorization from Fisheries for the non-listed relocation to upstream habitats. We will get that going once we have final concurrence from you on our comments.
3. You mention reporting the species, gender, and length measurement of each mussel. In addition we request age (number of growth rings) and transect or quadrat location where they were found to help interpret richness and abundance in the area.
4. We request the transect lengths be reduced to the midpoint of the river, but doubled in number to 26 to improve detection and focus in the impact area (essentially the same person effort). After the transects, a qualitative survey should commence (excluding the transects already surveyed). Qualitative survey effort should be broken into 2 person/hour periods. After each 2 hour period mussels would be processed. If new species are found during the 2 hour survey period, the survey effort would continue for another 2 hour period until no new species are found.
5. The upstream buffer area can be reduced to 100 meters to focus effort and save time, but the downstream buffer of 300 should remain the same to help fully consider downstream impacts from the streambank work.
6. In reporting, we also request the "raw data" in a clean table format as an attachment with information in #3 above included and any other relevant information collected.

Let us know if you have any questions or concerns with these requested changes. We will wait for your response to finalize the salvage authorization with Fisheries and verify the IDNR permit needs. The project should conclude before October 15, or before water temperatures drop below 59°F.

Thank you

Nathan Grider

Assistant Manager, Consultation Services

Office of Realty & Capital Planning

Illinois Dept. of Natural Resources

One Natural Resources Way
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From: Symonds, Daniel [<mailto:Daniel.Symonds@stantec.com>]
Sent: Monday, August 6, 2018 3:46 PM
To: Grider, Nathan <Nathan.Grider@Illinois.gov>
Cc: Fleece, Cody <Cody.Fleece@stantec.com>; Hoy, Matthew <Matthew.Hoy@stantec.com>; Peyton, Scott <Scott.Peyton@stantec.com>; Sridhar, Paul <Paul.Sridhar@stantec.com>; victor.modder@vistraenergy.com; phil.morris@vistraenergy.com; Matthew_Mangan@fws.gov; kristen_lundh@fws.gov
Subject: [External] Middle Fork Vermilion River Freshwater Mussel Survey Study Plan

Dear Mr. Grider,

Attached for your approval is our study plan for a mussel survey on the Middle Fork Vermilion River. Let us know if you have any questions.

Thank you,
Dan Symonds

Daniel Symonds

Aquatic Ecologist

Direct: 614 643-4363
Daniel.Symonds@stantec.com

Stantec
1500 Lake Shore Drive Suite 100
Columbus OH 43204-3800 US

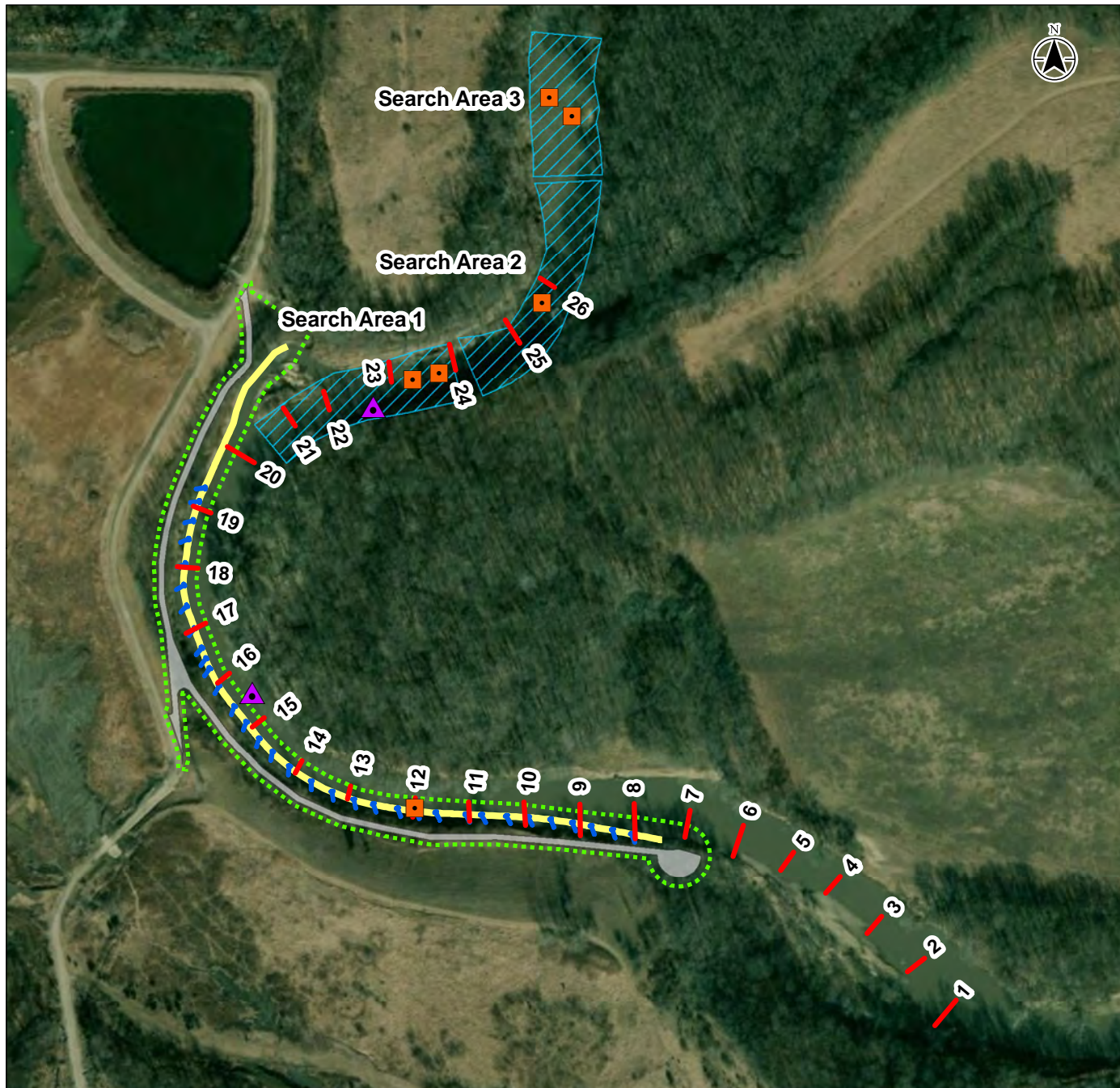
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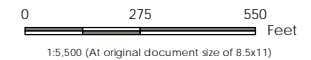
October 24, 2018

Appendix B FIGURES



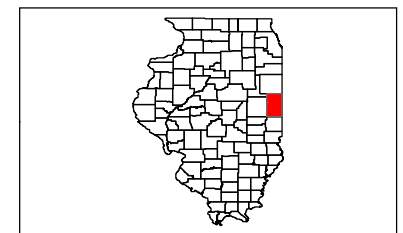
Legend

- *Lampsilis fasciola*
- ▲ *E. torulosa rangiana*
- Transects
- Root Wad
- Stone Toe Protection
- - - Limits of Construction
- Access Road
- ▨ Search Area



Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Base Imagery: ESRI Map Services.



Project Location: Oakwood, IL, Vermilion Co. 123456789
 Prepared by EKD on 2018-09-28
 Technical Review by WCF on 2018-09-30
 Independent Review by DS on 2018-10-01

Client/Project: Vistra Energy
 Middle Fork Vermillion River
 Erosion Mitigation and Riverbank Stabilization

Figure No.: 1
 Title:

Freshwater Mussel Survey

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Appendix C SITE PHOTOGRAPHS

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

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Photo 1. Transect #1 looking downstream outside of project area.



Photo 2. Transect 1 looking upstream towards transects 2-4.

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Photo 3. Transect 6 looking downstream.



Photo 4. Transect 6 looking upstream.

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Photo 5. Transect 9 west bank.



Photo 6. Riverbank at Transect 10.

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Photo 7. Transect 11 looking downstream.



Photo 8. Transect 11 looking upstream at west bank.

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Photo 9. Transect 12 looking upstream.



Photo 10. Transect 12 on right descending (west) bank.

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Photo 11. Transect 13 looking upstream. Tagged *E. rangiana* shell was found near sandbar on right hand side of photo.



Photo 12. Transect 15, right descending (west) bank.

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Photo 13. Transect 16 looking upstream.



Photo 14. Transect 20 looking downstream.

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 15. Transect 20 looking upstream.



Photo 16. Transect 21 looking upstream.

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 17. *Percina sciera* (Dusky Darter)



Photo 18. *Nocomis biguttatus* (Hornyhead Chub)

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 19. *Etheostoma caeruleum* (Rainbow Darter)



Photo 20. *Etheostoma flabellare* (Fantail Darter)

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 21. *Micropterus dolomieu* (Smallmouth Bass)

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018

Appendix D SPECIMEN PHOTOGRAPHS

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 1. *Anodontoidea ferussacianus* (Cylindrical Papershell)



Photo 2. *Lasmigona costata* (Flutedshell)

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 3. *Lampsilis siloquoidea* (Fatmucket)



Photo 4. *Fusconaia flava* (Wabash Pigtoe)

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 5. *Lampsilis fasciola* (Wavyrayed Lampmussel)



Photo 6. *Pyganodon grandis* (Giant Floater)

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 7. *Lampsilis cardium* (Plain Pocketbook)



Photo 8. *Cyclonaias pustulosa* (Wartyback)

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 9. *Epioblasma rangiana* (Northern Riffleshell) shell



Photo 10. *Epioblasma rangiana* (Northern Riffleshell) shell

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 11. *Epioblasma rangiana* (Northern Riffleshell) shell



Photo 12. *Epioblasma rangiana* (Northern Riffleshell) shell

FRESHWATER MUSSEL SURVEY ON THE MIDDLE FORK VERMILION RIVER

October 24, 2018



Photo 13. *Cyclonaias tuberculata* (Purple Wartyback) shell



Photo 14. *Lampsilis fasciola marsiupia* and lure

October 24, 2018

Appendix E ILLINOIS AND FEDERAL COLLECTING PERMITS

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Authorization is hereby granted, under Section 5/3.22,
Chapter 520, Section 5/20-100, Chapter 515 and Section
68/40-5, Chapter 510 of the Illinois compiled Statutes to:

Last Name: **Fleece**

First Name: **Cody**

Permit Number: **NH18.6234**

Issued: **8/8/2018**

Expires: **12/31/2018**

Business Name: **Stantec Consulting Services, Inc.**

Street Address: **11687 Lebanon Road**

City: **Cincinnati**

State: **OH** Zip Code: **45241**

for strictly scientific, educational or zoological purposes, to take the Illinois fauna identified below subject to the following provisions:

As this is a new permit, the applicant appears to meet the minimum requirements and there are no known issues with previous permits or the applicant, I would recommend approving with the following provisions:

Applicant and all individuals listed may legally capture, handle, collect data and/or obtain biological samples, by scientifically accepted and approved methods, for projects and species listed below [as listed on the accompanying Illinois Department of Natural Resources (IDNR) scientific permit application/project proposal (on file in Springfield, IL) strictly for scientific, educational and/or zoological purposes]. Permitted activities include: may conduct survey for non-listed mussel species by hand, handling for identification and data collection. All individuals will be released unharmed at or near the original site of capture immediately upon completion of data collection. Possession of a valid scientific collection permit does not grant access for permitted activities as other permits may be required. A federal permit is required for all projects involving federally regulated species, including migratory birds. If species listed as endangered and threatened under Illinois Administrative Code Title 17: Chapter 1, Part 1010 (<https://www.dnr.illinois.gov/ESPB/Pages/default.aspx>) are incidentally captured and handled during the permitted activity, the occurrence needs to be documented (preferably with photographs of diagnostic characteristics and geographic location) and reported via email to Tara Kieninger at: tara.kieninger@illinois.gov within (1) week. The specimen cannot be removed and should be released on site immediately. Intentional capture, handling and/or collection of endangered or threatened species require prior approval and possession of an Endangered or Threatened Species Permit. Any permitted activities conducted on State-owned properties require prior approval and possession of an IDNR Research / Site Permit. Any permitted activities conducted on sites Dedicated or Registered through the Illinois Nature Preserves Commission require prior approval and possession of an INPC Research Permit. Applicants must utilize appropriate decontamination procedures to prevent the spread of disease between individuals and sites and every effort should be made to prevent the spread of exotic or invasive plants/plant propagules.

Authorization: **Vermillion county**

Individuals working under direction of applicant include: **Daniel Symonds, Dillon McNulty, Kari Soltau**

Special disinfection guidelines for aquatic environments (minimum requirements):

Upon completion and prior to initiation of work at a new site, all equipment and personal gear used should be rinsed with water to remove mud and debris and then a 3% solution of household bleach should be applied by either dipping (for one minute) or spraying onto all surfaces exposed to water. Disinfection procedures must be conducted in an environmentally appropriate setting (off-site, gravel parking lot, etc.). Equipment not reused immediately may also be air dried for a period of greater than two weeks as an alternative measure to deactivate pathogens.

I agree to the following provisions and terms of this Scientific Permit.

Permittee's

Signature: 

(Permit not valid unless signed)

Approved By: 

Office of Resource Conservation

Date: **8/10/18**

TERMS FOR SCIENTIFIC PERMIT

1. Under no circumstances shall a scientific permit be used in lieu of sport or commercial licenses.
2. All taking shall be performed by or under the direct supervision of the permittee. Permittee must be present with persons involved in actual taking.
3. All gear left unattended must be tagged bearing name and scientific permit number of permittee.
4. Permittee must be at least eighteen (18) years of age.
5. Permits are not transferable and PERMITTEE SHALL CARRY PERMIT AT ALL TIMES WHEN TAKING FAUNA.
6. Agency, company or institution listed on the application is responsible for the taking activities and reports of the individual issued this permit
7. Scientific permits will not be valid for taking any species appearing on official State List of Endangered and Threatened Vertebrate Species of Illinois (see attached Administrative Rule, Part 1010) without specific written approval from the Department of Natural Resources.
8. A federal Permit is required for the taking of species protected by the Federal Government in addition to the State Scientific Permit.
9. The Division of Wildlife Resources may require special conditions or provisions on any Scientific Permit.
10. Use of rotenone or any other toxic materials for taking must have special written approval from the Department of Natural Resources and may need a variance from the Illinois Environmental Protection Agency.

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

**Authorization is hereby granted, under Section 5/3.22,
Chapter 520, Section 5/20-100, Chapter 515 and Section
68/40-5, Chapter 510 of the Illinois compiled Statutes to:**

11. By January 31 of next year, an annual report of the permittee's activities must be submitted to the Division of Wildlife Resources. In addition, the permittee shall submit a copy of all written reports, etc. that result from the permitted activity. Permits will be renewed after these annual reports and appropriate publications have been received.
12. Any permit may be revoked or suspended at any time by the Department of Natural Resources.
13. Permits expire December 31 each calendar year unless otherwise specified.

The Department of Natural Resources is an equal opportunity employer.

2/1/18





Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

Bruce Rauner, Governor
Wayne A. Rosenthal, Director

Dear Scientific Permit Holder:

Enclosed is your Scientific Permit which is issued in accordance with Section 520:5/3.22 of the Illinois Wildlife Code, and Section 515:5/20-100 of the Illinois Fish Code. It authorizes, strictly for Scientific or salvage purposes, the taking of Illinois fauna by methods or in quantities otherwise prohibited by these Codes, or other Federal or State Statutes that may apply. Failure to comply with the provisions of this permit will lead to its revocation.

Records of all specimens taken will be maintained and shall be made available by the permittee for inspection at all reasonable hours by an authorized Department person. By January 31, 2019, an annual report of your activities must be submitted to the Department of Natural Resources, Office of Resource Conservation, on the enclosed form. In addition, the permittee shall submit one copy of all written reports, including but not limited to, research papers, theses progress reports, publications, and environmental assessment reports that result from the permitted activity. Permits will be renewed only after the annual report and appropriate publications have been received.

Please read the terms of your Scientific Permit closely and note that it will expire on December 31, 2018. It is important that you adhere to the species and methods listed on the Permit.

Sincerely,

Christopher L. Young, Director
Office of Resource Conservation

CLY:clr



www.dnr.illinois.gov

Wayne A. Rosenthal, Director

[illegible]

Fish & Aquatic Life

(515 ILCS 5/20-100) (from Ch. 56, par. 20-100)

Scientific collector's permit

Sec. 20-100. Scientific collector's permit. Permits may be granted by the Department to properly accredited individuals of the age of 18 years and older permitting the collection for strictly scientific purposes of any aquatic life protected under this Code, and their nests, eggs, and spawn.

The application for a permit for scientific purposes shall be subject to the approval of the Department.

The holder of each scientific collector's permit shall make reports to the Department as required.

(Source: P.A. 89-66, eff. 1-1-96.)

(515 ILCS 5/20-105) (from Ch. 56, par. 20-105)

Sec. 20-105. Revocation and suspension; refusal to issue.

(a) Whenever a license or permit is issued to any person under this Code and its holder is found guilty of any misrepresentation in obtaining the license or permit or of a violation of any of the provisions of this Code, including administrative rules, the license or permit may be revoked by the Department and the Department may refuse to issue any permit or license to that person and may suspend the person from engaging in the activity requiring the permit or license for a period of time not to exceed 5 years following the revocation. Department revocation procedure shall be established by administrative rule.

(b) Whenever any person who has not been issued a license or a permit under the provisions of this Code is found guilty of a violation of the provisions of this Code, including administrative rules, the Department may refuse to issue any permit or license to that person, and suspend that person from engaging in the activity requiring the permit or license for a period of time not to exceed 5 years.

(c) Any person who knowingly or intentionally violates any of the provisions of this Code, including administrative rules, during the 5 years following the revocation of his or her license or permit under subsection (a) or during the time he is suspended under subsection (b), shall be guilty of a Class A misdemeanor as provided in Section 20-35.

(d) A person whose license or permit to engage in any activity regulated by this Code has been suspended or revoked may not, during the period of the suspension or revocation or until obtaining such a license or permit, (i) be in the company of any person engaging in the activity covered by the suspension or revocation or (ii) serve as a guide, outfitter, or facilitator for a person who is engaged or prepared to engage in the activity covered by the suspension or revocation.

(e) No person may be issued or obtain a license or permit or engage in any activity regulated by this Code during the time that the person's privilege to engage in the same or similar activities is suspended or revoked by another state, by a federal agency, or by a province of Canada.

(Source: P.A. 91-545, eff. 8-14-99.)

(515 ILCS 5/20-110) (from Ch. 56, par. 20-110)

Possession of license, permit, or stamp.

Sec. 20-110. Possession of license, permit, or stamp. Every person holding any license, salmon stamp, inland trout stamp, or permit issued under this Code shall have it in his or her possession for immediate presentation for inspection to the authorized employees of the Department, or to any sheriff, deputy sheriff, or any other peace officer, making a demand for it within his or her jurisdiction.

(Source: P.A. 87-833; 88-91.)

Wildlife

(520 ILCS 5/2.1) (from Ch. 61, par. 2.1)

Ownership

Sec. 2.1. The ownership of and title to all wild birds and wild mammals within the jurisdiction of the State are hereby declared to be in the State, and no wild birds or wild mammals shall be taken or killed, in any manner or at any time, unless the person or persons so taking or killing the same shall consent that the title thereto shall be and remain in the State for the purpose of regulating the taking, killing, possession, use, sale and transportation thereof, after such taking or killing, as hereinafter set forth. The taking or killing of wild birds or wild mammals at any time, in any manner, and by any person, shall be deemed a consent on the part of such person that the title to such wild birds or wild mammals shall remain in the State for the purpose of regulating the possession, use, sale and transportation thereof.

The regulation and licensing of the taking of wildlife in Illinois are exclusive powers and functions of the State. A home rule unit may not regulate or license the taking of wildlife. This Section is a denial and limitation of home rule powers and functions under subsection (h) of Section 6 of Article VII of the Illinois Constitution.

(Source: P.A. 87-296.)

(520 ILCS 5/3.22) (from Ch. 61, par. 3.22)

Permits to capture, band or collect.

Sec. 3.22. Permits may be granted by the Department to any properly accredited person at least 18 years of age, permitting the capture, banding or collecting (including nests, eggs or young), for strictly scientific purposes, of any of the fauna now protected under this Code. A special salvage permit may be granted to qualified individuals at least 15 years of age for the purpose of salvaging dead or crippled wildlife species protected by this Act for permanent donation to bona fide public or state scientific, educational or zoological institutions or, for the purpose of rehabilitation and subsequent release to the wild, or other disposal as directed by the Department. The application for such a permit shall be approved by the Department.

The holder of each such permit shall make to the Department, within 30 days after the expiration of his or her permit, a report in writing upon blanks furnished by the Department. Such report shall show the name and address of all persons from whom specimens were received, the kinds of specimens taken, disposition made of same, and any other information which the Department may consider necessary.

(Source: P.A. 85-150.)

(520 ILCS 5/3.36) (from Ch. 61, par. 3.36)

Sec. 3.36. Revocation and suspension.

(a) Whenever a license or permit is issued to any person under this Act, and the holder thereof is found guilty of any misrepresentation in obtaining such license or permit or of a violation of any of the provisions of this Act, including administrative rules, his license or permit may be revoked by the Department, and the Department may refuse to issue any permit or license to such person and may suspend the person from engaging in the activity requiring the permit or license for a period of time not to exceed 5 years following such revocation.

Department revocation procedures shall be established by Administrative rule.

(b) Whenever any person who has not been issued a license or a permit under the provisions of this Code is found guilty of a violation of the provisions of this Code, including administrative rules, the Department may refuse to issue any permit or license to that person, and suspend that person from engaging in the activity requiring the permit or license for a period of time not to exceed 5 years.

(c) Any person who knowingly or intentionally violates any of the provisions of this Act, including administrative rules, during such period when his license or permit is revoked or denied by virtue of this

Section or during the time he is suspended under subsection (b), shall be guilty of a Class A misdemeanor.

(d) Licenses and permits authorized to be issued under the provisions of this Act shall be prepared by the Department and be in such form as prescribed by the Department. The information required on each license shall be completed thereon by the issuing agent or his sub-agent at the time of issuance and each license shall be signed by the licensee, or initialed by the designated purchaser and then signed immediately upon receipt by the licensee, and countersigned by the issuing agent or his sub-agent at the time of issuance. All such licenses shall be supplied by the Department, subject to such rules and regulations as the Department may prescribe. Any license not properly prepared, obtained and signed as required by this Act shall be void.

(e) A person whose license or permit to engage in any activity regulated by this Code has been suspended or revoked may not, during the period of the suspension or revocation or until obtaining such a license or permit, (i) be in the company of any person engaging in the activity covered by the suspension or revocation or (ii) serve as a guide, outfitter, or facilitator for a person who is engaged or prepared to engage in the activity covered by the suspension or revocation.

(f) No person may be issued or obtain a license or permit or engage in any activity regulated by this Code during the time that the person's privilege to engage in the same or similar activities is suspended or revoked by another state, by a federal agency, or by a province of Canada.

(Source: P.A. 90-225, eff. 7-25-97; 91-545, eff. 8-14-99.)

TITLE 17: CONSERVATION
CHAPTER 1: DEPARTMENT OF NATURAL RESOURCES
SUBCHAPTER b: FISH AND WILDLIFE

PART 520
SCIENTIFIC PERMITS

Section

520.10	Purpose
520.20	Requirements and Application
520.30	General Provisions
520.40	Renewal
520.50	Revocation and Suspension of Permits - Hearings and Appeals

AUTHORITY: Implementing and authorized by Sections 1-120, 1-135 and 20-100 of the Fish and Aquatic Life Code [515 ILCS 5/1-120, 1-135, 20-100] and Sections 1.2, 1.3, 2.1, 2.4, 3.22, and 3.26 of the Wildlife Code [520 ILCS 5/1.2, 1.3, 2.1, 2.4, 3.22 and 3.26].

SOURCE: Adopted and codified at 7 Ill. Reg. 1236, effective January 26, 1983; amended at 12 Ill. Reg. 1815, effective December 31, 1987; amended at 14 Ill. Reg. 10811, effective June 20, 1990; recodified by changing the agency name from Department of Conservation to Department of Natural Resources at 20 Ill. Reg. 9389.

Section 520.10 Purpose

The following rules and regulations have been established to govern the taking and/or possession of Illinois Fauna (protected under 515 ILCS 5/2-25 and 520 ILCS 5/2.2) for scientific purposes and the issuance of said permits for such activities.

Section 520.20 Requirements and Application

Any person who wishes to take or salvage Illinois fauna for scientific purposes must obtain and possess a valid scientific permit from the Department.

- a) To be eligible for a scientific permit for scientific research the applicant must be:
 - 1) 18 years of age, and
 - 2) Engaged in scientific research which may include, but not necessarily limited to, research sponsored by universities and/or colleges.
- b) To be eligible for a scientific permit for salvage and subsequent rehabilitation of

crippled fauna the applicant must be or have:

- 1) 15 years of age,
 - 2) A salvage permit the previous year or submit a reference statement from a licensed veterinarian, zoological curator, conservation police officer or a Department of Natural Resources Wildlife Resources, Natural Heritage, or Fisheries biologist as appropriate stating that the applicant has experience in treating and handling wild animals and has facilities available to treat, care for and produce self-dependent fauna for release to the wild, and
 - 3) Public or state scientific, educational or zoological institutions available which will take dead and/or permanently disabled fauna.
- c) Application for scientific permit shall be made on forms provided by the Department's Division of Wildlife Resources and may be obtained by submitting a request to the Division at Lincoln Tower Plaza, 524 South Second St., Springfield, Ill. 62706.
- d) Scientific permits will be issued by the Department provided the applicant has met the eligibility requirements as per this section and the application form has been completed and project description meets the criteria of 520.30.
- e) Final judgment of applications will be made by the Chief, Division of Wildlife Resources on Wildlife permits; by the Chief, Division of Fisheries on Fisheries permits; and by the Chief, Division of Natural Heritage on Heritage permits based on the criteria contained in Section 520.20(d).
- f) The taking of migratory or other species protected by Federal regulations must be approved by the U.S. Department of Interior after the Scientific Permit for Illinois is approved. The only exception to this is banding permits which will be issued only after issuance of a Federal permit. The taking of any endangered or threatened species must be done with concurrence of the Endangered Species Program Coordinator and, for taking of Federally listed species, the U.S. Department of the Interior.

(Source: Amended at 12 Ill. Reg. 1815, effective December 31, 1987)

Section 520.30 General Provisions

- a) Permanent employees of state or federal conservation agencies, universities or other

scientific institutions (such as government museums and laboratories) shall be issued a scientific permit valid for the term of their employment, as long as that person continues to submit, by January 31 of each year, an annual report of the past year's activities. Scientific permits for persons not employed by an above referenced organization will be issued on an annual basis and will expire on December 31.

- b) The scientific permit is valid for only the approved type of research and/or salvage stated on the permit. Under no circumstances shall a scientific permit be used in lieu of sport or commercial licenses.
- c) Permittee's method of taking fauna must be approved by the Department. Approved methods include but are not limited to, seines, electro-fishing, nets, hand, snap traps, live traps and foot-hold traps. All devices used for taking, which are left unattended, must have the permittee's name, address and scientific permit number visible on them.
- d) Taking and/or salvage of fauna shall be performed by or under the direct supervision of the permittee. Permittee must be present with person involved in actual taking of fauna.
- e) Taking and/or salvage of fauna is only allowed in areas designated on the permit.
- f) Taking and/or salvage of fauna on private properties requires oral or written landowner's permission. This permit does not allow the privilege of trespass.
- g) Taking and/or salvage of fauna on state owned or managed lands is not permitted without the prior approval of the Site Superintendent.
- h) The scientific permit must be carried on the person at all times when taking specimens and be presented, upon request, to Department personnel.
- i) Fauna taken and/or salvaged and rehabilitated must be released to the wild or permanently donated to a public or state scientific educational or zoological institution.
- j) Permittee is responsible for the taking activities and report of the individual issued the permit. Permittee must maintain a record of all specimens taken and shall present such record upon request to Department personnel.
- k) Permittee by January 31 of the next year shall submit an annual report to the Department of the past year's activities on forms provided by the Department, and mailed to address referred to in (Section 520.20 (c)). The permittee shall also

provide the Department (2) two copies of all written reports resulting from the permitted activities. Permits will be renewed only after copies of the annual report and all written reports have been received by the Department.

- l) A scientific permit does not release the permittee from other provisions of the Ill. Adm. Code nor from Federal or State Statutes and does not supersede Federal permits.
- m) Any person using rotenone or other toxic materials for taking of fauna must notify the Department prior to using such materials, and may need a variance from the Illinois Environmental Protection Agency.

(Source: Amended at 14 Ill. Reg. 10811, effective June 20, 1990)

Section 520.40

Renewal

Renewal of current permits, which require more than one year to complete the project, require the permittee to submit an annual report as prescribed in Section 520.30(j). Failure to provide these reports by March 31 will result in denial of subsequent renewal requests by the permittee.

Section 520.50

Revocation and Suspension of Permits - Hearings and Appeals

In accordance with Section 5.19 of the Fish Code and Section 3.36 of The Wildlife Code [515 ILCS 5/20-110 and 520 ILCS 5/3.23], failure to comply with the provisions of the scientific permit, Fish and Wildlife Codes of Illinois pertaining to scientific permits, and this Part or providing false information to obtain a scientific permit will result in suspension or revocation of the scientific permit. Suspension of the scientific permit will be for a period of not less than one year. The procedure by which suspensions and revocations are made, the rights of permittees to notice and hearing; and the procedures governing such hearings are set forth in 17 Ill. Adm. Code 2530.



Illinois Department of Natural Resources
Endangered and Threatened Species Permit

Permit Number: **2584**

Issued Date: 8/29/2018

Expiration Date: 12/31/2018

This permit is valid for the following Counties in Illinois:

Vermilion

Pursuant to 520 ILCS 10/5 and 17 Ill. Adm. Code 1070.10-1070.80, this permit is issued to:

Cody Fleece
11687 Lebanon Road
Cincinnati, OH 45241

and covers the following additional personnel:

Dillon McNulty
Daniel Symonds
Kari Soltau

from:

Stantec Consulting

for the purpose of SCIENTIFIC RESEARCH involving the following specimens and/or products:

<i>Species</i>	<i>Item</i>	<i># Specimens/ Products</i>	<i>Collection Method</i>	<i>Action</i>	<i>Disposition</i>
Mussels - Black Sandshell - <i>Ligumia recta</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Butterfly - <i>Ellipsaria lineolata</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Clubshell - <i>Pleurobema clava</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Ebonyshell - <i>Fusconaia ebena</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Elephant-ear - <i>Elliptio crassidens</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Fanshell - <i>Cyprogenia stegaria</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Fat Pocketbook - <i>Potamilus capax</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Higgins Eye - <i>Lampsilis higginsii</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Kidneyshell - <i>Ptychobranhus fasciolaris</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Little Spectaclecase - <i>Villosa lienosa</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen

Mussels - Northern Riffleshell - <i>Epioblasma torulosa rangiana</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Ohio Pigtoe - <i>Pleurobema cordatum</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Orange-foot Pimpleback - <i>Plethobasus cooperianus</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Pink Mucket - <i>Lampsilis abrupta</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Purple Lilliput - <i>Toxolasma lividus</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Purple Wartyback - <i>Cyclonaias tuberculata</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Rabbitsfoot - <i>Quadrula cylindrica</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Rainbow - <i>Villosa iris</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Salamander Mussel - <i>Simpsonaias ambigua</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Scaleshell Mussel - <i>Leptodea leptodon</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Sheepnose - <i>Plethobasus cyphus</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Slippershell - <i>Alasmodonta viridis</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Snuffbox - <i>Epioblasma triquetra</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Spectaclecase - <i>Cumberlandia monodonta</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Spike - <i>Elliptio dilatata</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen
Mussels - Wavy-rayed Lampmussel - <i>Lampsilis fasciola</i>	Live Individual	N/A	Hand Capture	Observe	Catch and Release Live Specimen

If the research project covered by this permit will involve propagation, the permit holder and additional personnel listed above are required to possess an IDNR endangered and threatened species permit Propagation Addendum.

Possession of federally listed species is covered by:

USDA Exhibitor Permit #

U.S. Fish and Wildlife Service Permit #

The research project covered by this permit will address:

☒ *Distribution or status of the listed species*

☐ *Threats to the listed plants and animals and/or their habitats*

☒ *Life history of the listed species*

☐ *Effects of exotic species on native populations*

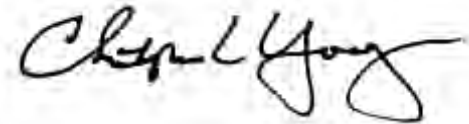
- | | |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Ecological needs of the natural populations of the species | <input checked="" type="checkbox"/> Genetic diversity within population |
| <input type="checkbox"/> Supplementing existing populations | <input type="checkbox"/> Wildlife disease vectors and transmission |
| <input type="checkbox"/> Captive rearing | <input type="checkbox"/> Translocation to unoccupied locations within species' historic range |
| <input type="checkbox"/> Effects of management actions on animals or plants | <input type="checkbox"/> Impact of wind turbines on listed species |
| <input checked="" type="checkbox"/> Movement or habitat use | <input type="checkbox"/> Propagation for release into the wild |
| <input type="checkbox"/> Other: | |

The specific locations where this research will be conducted are:

<i>Research Location</i>	<i>Nearest City</i>
Many within Vermilion County	

**ITEMS LISTED ON THIS PERMIT MAY BE SOLD,
GIVEN AWAY, OR OTHERWISE DISPOSED OF ONLY
WITH PERMISSION OF THE ILLINOIS
DEPARTMENT OF NATURAL RESOURCES.**

Signed:



Christopher Young
Office Director

IDNR Office of Resource Conservation
As designee of IDNR Director, Wayne A. Rosenthal

Special Conditions (IF APPLICABLE):

Please note that this permit is not valid unless accompanied by any and all Federal/USFWS permits and/or provisions. Before any research is conducted within a State owned and/or operated site, permission from the Site Superintendent must be granted. Permittee must apply for and receive a Permit for Research in Illinois State Parks, Forests and Conservation Areas. Research within a Nature Preserve cannot occur unless written authorization/special use permit is granted from the Illinois Nature Preserves Commission.

Conditions:

- A copy of this permit must be in the possession of the permit holder when engaged in activities involving endangered or threatened species.
- There shall be no propagation of or attempt to propagate any endangered or threatened species covered by this permit unless a signed IDNR addendum approving propagation is attached. In addition, the Propagation Addendum must be in the possession of the permit holder when engaged in all activities involving propagation of an Illinois listed species.
- Permit holder cannot move/transport/translocate any endangered or threatened species outside of a designated project area/zone of impact without expressed written consent of the Director of the Illinois Department of Natural Resources.
- Permit holder shall notify IDNR of any changes to personal information within 10 days of making such changes.
- Permit holder shall notify IDNR of any changes to inventory of specimens through escape, theft, death or other unanticipated events within five working days of the discovery of loss.
- Permit holder must provide the Department with an electric copy or two hard copies of any reports, technical papers, or technical notes that result from studies conducted under the auspices of this permit.
- An annual report must be submitted to IDNR by January 31st of each year.

The holder of this permit may:

- Dispose of specimens or products covered by this permit through transfer or scrapping only after a permit/written permission has been applied for and received from the Department.
- Allow temporary possession of the items covered by this permit by a licensed taxidermist for the purpose of providing taxidermic services.

This permit may be revoked if the Department finds that a permittee has falsified information on the application, failed to comply with facilities standard or animal welfare standards established in 17 Ill. Adm. Code 1070.60 and 1070.70, or violated state or federal laws.



DEPARTMENT OF THE INTERIOR
U.S. FISH & WILDLIFE SERVICE
Endangered Species Permit Office
5600 American Boulevard, West, Suite 990
Bloomington, MN 55437-1458
permitsR3ES@fws.gov

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

STANTEC CONSULTING SERVICES
10509 TIMBERWOOD CIRCLE
SUITE 100
LOUISVILLE, KY 40223-2177
U.S.A.

2. AUTHORITY-STATUTES
16 USC 1539(a)
16 USC 1533(d)

REGULATIONS
50 CFR 17.22
50 CFR 17.32

50 CFR 13

3. NUMBER
TE38821A-3

AMENDMENT

4. RENEWABLE
☒ YES
☐ NO

5. MAY COPY
☒ YES
☐ NO

6. EFFECTIVE
07/29/2016

7. EXPIRES
12/31/2021

8. NAME AND TITLE OF PRINCIPAL OFFICER (If #1 is a business)

GEORGE ATHANASAKES
ECOSYSTEM RESTORATION SERVICES LEADER

9. TYPE OF PERMIT

NATIVE ENDANGERED & THREATENED SP. RECOVERY - E & T
WILDLIFE

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED

ON LANDS SPECIFIED WITHIN THE ATTACHED SPECIAL TERMS AND CONDITIONS

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL, TRIBAL, OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

C.1. FOR LISTED BAT SPECIES, VALID FOR USE BY JAMES KISER, DOUGLAS STEPHENS, JEFFREY BROWN, KRISTEN WATROUS, DAVID SAUGEY, JAMES EVANS, JOSEPH JOHNSON, AND LINDSAY WIGHT. TRAINED ASSISTANTS MAY WORK ON PERMITTED ACTIVITIES UNDER THE DIRECT AND ON-SITE SUPERVISION OF JAMES KISER, DOUGLAS STEPHENS, JEFFREY BROWN, OR KRISTEN WATROUS. AT LEAST ONE NAMED PERMITTEE MUST REMAIN PRESENT AT EACH MIST-NET SITE WHILE IT IS BEING OPERATED.

C.1.a. WES CUNNINGHAM MAY WORK UNDER THE AUTHORITY OF THIS PERMIT FOR GRAY BAT ONLY.

C.1.b. LYNDA MILLS MAY WORK UNDER THE AUTHORITY OF THIS PERMIT FOR GRAY BAT, NORTHERN LONG-EARED BAT AND INDIANA BAT ONLY.

C.2. FOR LISTED MUSSELS AND FISH SPECIES, VALID FOR USE BY JAMES KISER, DOUGLAS STEPHENS, SAM CALL, AND CODY FLEECE. TRAINED ASSISTANTS MAY WORK ON PERMITTED ACTIVITIES UNDER THE DIRECT AND ON-SITE SUPERVISION OF JAMES KISER, DOUGLAS STEPHENS, SAM CALL OR CODY FLEECE.

C.3. FOR COPPERBELLY WATERSNAKE, VALID FOR USE BY JAMES KISER. TRAINED ASSISTANTS MAY WORK ON PERMITTED ACTIVITIES UNDER THE DIRECT AND ON-SITE SUPERVISION OF JAMES KISER.

D. ACCEPTANCE OF THIS PERMIT SERVES AS EVIDENCE THAT THE PERMITTEE AND ITS AUTHORIZED AGENTS UNDERSTAND AND AGREE TO ABIDE BY THE TERMS OF THIS PERMIT AND ALL SECTIONS OF TITLE 50 CODE OF FEDERAL REGULATIONS, PARTS 13 AND 17, PERTINENT TO ISSUED PERMITS (<http://www.fws.gov/permits/ltr/ltr.html>). SECTION 11 OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED, PROVIDES FOR CIVIL AND CRIMINAL PENALTIES FOR FAILURE TO COMPLY WITH PERMIT CONDITIONS.

E. Permittee (as described in condition C. above) is authorized to take Indiana bat (*Myotis sodalis*), gray bat (*M. grisescens*), northern long-eared bat (*M. septentrionalis*), Ozark big-eared bat (*Corynorhinus townsendii ingens*), Virginia big-eared bat (*C. t. virginianus*), listed mussel and fish species identified in Attachment 1, and copperbelly water snake (*Nerodia*

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS

ANNUAL REPORT DUE: 01/31

ISSUED BY

TITLE

CHIEF - ENDANGERED SPECIES

DATE

07/29/2016

erythrogaster neglecta) for scientific research aimed at recovery of the species: presence/absence surveys, studies to document habitat use, population monitoring, and evaluate potential impacts as described herein. This permit does not authorize the collection of voucher specimens.

F. Presence/absence surveys and studies to document habitat use are authorized at the following locations:

- F.1. Locations within Region 3 of the USFWS: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin, upon receipt of written concurrence from Field Supervisor, as outlined in Condition G.
- F.2. Locations within Region 4 of the USFWS: Alabama, Arkansas, Georgia, Louisiana, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee, upon receipt of written concurrence from Field Supervisor, as outlined in Condition G.
- F.3. Locations within Region 5 of the USFWS: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia upon receipt of written concurrence from Field Supervisor, as outlined in Condition G.
- F.4. Locations within Region 6 of the USFWS: Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, and Wyoming, upon receipt of written concurrence from Field Supervisor, as outlined in Condition G.
- F.5. Location within Region 2 of the USFWS: Texas and Oklahoma, upon receipt of written concurrence from Field Supervisor, and upon coordination with Ozark Plateau National Wildlife Refuge prior to 1) surveys of caves known to be used by federally-listed bats, and 2) examinations of caves suspected of containing federally-listed bats species (some presence/absence surveys may require the presence of a U.S. Fish and Wildlife Biologist), as outlined in Condition G.

G. For all locations specified in Condition F., Permittee shall request site specific authorization from the USFWS Field Supervisor for the state in which activities are proposed to occur at least 15 days prior to conducting any activities. Your notification must be in writing and must indicate:

- G.1. Species for which proposed activities are being conducted.
- G.2. Location of proposed activities, including project site, county, and state.
- G.3. A description of the activities (i.e., surveys, radio-telemetry studies, etc.).
- G.4. Dates when the project is proposed to take place.
- G.5. Evidence that Permittee has received any required contracts to complete the activities.
- G.6. Whether all annual reporting requirements have been fulfilled.
- G.7. You may proceed with activities only upon receipt of written concurrence from the applicable USFWS Field Supervisor. *Your concurrence letter must be carried with this permit to authorize site-specific activities.*

H. Permittee shall adhere to following conditions involving capture and handling of bats:

- H.1. Activities may be conducted by Stantec personnel as conditioned in Condition C.1.
- H.2. Bats may be captured with mist nets following the protocol included in the Range-wide Indiana Bat Summer Survey Guidelines. Guidelines are available at:
<http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html>. Note that you must use the most up-to-date version of the Summer Survey Guidelines, available at the USFWS web site, for your summer surveys. The monitoring interval for mist nets is +/- 10 minutes and may not exceed 15 minutes. Captured bats may be held for a maximum of 30 minutes, unless injured. In extenuating circumstances, bats shall be held for no longer than 45 minutes.
- H.3. Bats may be captured with harp traps with written concurrence from the Field Supervisor in the state in which trapping is proposed. Harp traps must be continually monitored. Captured bats may be held for a maximum of 30 minutes, unless injured. In extenuating circumstances, bats shall be held for no longer than 45 minutes.
- H.4. Permittee shall carry out non-intrusive measurements on all captured bats. Data shall be recorded for all bats captured and include, but not be limited to, the data requested in any automated or species specific data sheet

provided by the USFWS (e.g., Bat Reporting Spreadsheet, Condition H.2.). Handling should be limited to the maximum extent practicable and should cease immediately at signs of undue stress (e.g., bat becoming unresponsive, etc.). Bats that appear stressed from handling should be placed in a dark, quiet location away from activity where it can safely fly away after recovery, and should be checked to ensure successful recovery before leaving the study site. Photographs of the identifying characteristics for each individual federally-listed species captured are encouraged. The Permittee may be requested to provide individual photographs after submittal of annual reporting data.

- H.5. Radio transmitters may be applied during spring, summer, and fall roosting and migration periods via nontoxic skin bond adhesive. The total weight of the transmitter may not exceed 5% of the bat's body weight and the total weight of the package (transmitter and adhesive) may not exceed 6% of the bat's body weight. The lightest package (both transmitter and adhesive) capable of accomplishing the required task should be used, especially with pregnant females and newly volant juveniles. Bats carrying transmitters must be monitored daily for at least three days, or until the transmitter falls off, whichever occurs first. When conducting mist-netting within the white-nose syndrome (WNS) zone of the range of the northern long-eared bat in support of proposed tree removal activities, permittee is expected to radio-tag and track female and juvenile northern long-eared bats in an attempt to locate roost trees and/or hibernacula, unless otherwise directed by the appropriate Field Office identified in Condition Q. Specifics on the number of females or juveniles that are expected to be tracked will be determined in coordination with the appropriate Field Office, as specified in Condition G. (above).
- H.6. No trapping activities shall occur within 20 meters of a known or potential summer or winter maternity roost site, either natural or artificial roosts, unless Permittee receives prior written approval from the U.S. Fish and Wildlife Service Field Supervisor for the state in which the activities are proposed to occur.
- H.7. Caves, mines, or other suitable hibernation sites may be quietly searched in a manner that minimizes disturbance by utilizing the minimum number of people and time required to complete the survey. Surveys should not be repeated more often than once every other year in any given hibernaculum that is occupied by endangered or threatened bats. Where hibernacula area and safety conditions allow, individuals entering caves are recommended to utilize night vision goggles or red-filtered light and to remain in the cave no more than 90 minutes to complete the work.
- H.8. Equipment used to capture and handle bats shall be cleaned and decontaminated, including personal gear such as boots and gloves, using products cited in decontamination guidelines and in compliance with label directions. The most recent decontamination guidance is found on the web at:
<https://www.whitenosesyndrome.org/topics/decontamination>.
- I. Permittee is authorized to take (only in the context of harass by survey) mussel species identified in Attachment 1 for scientific research aimed at recovery of the species. Permittee shall adhere to the following conditions involving presence/absence surveys for mussel species:
 - I.1. Presence/absence studies and surveys to monitor mussel communities shall be conducted by personnel identified in Condition C.2.
 - I.2. Permittee may take (remove from the substrate for identification, data collection and return) mussels by hand via wading, snorkeling, or using divers.
 - I.3. Permittee may temporarily hold specimens in mesh bags, either suspended in the water or held in a container containing river water, while awaiting identification and data collection. Specimens may be held for up to 3 hours provided that they are held in the water in bags that allow free movement of water the mussels were taken from or held in large containers of river water that is replaced every hour [every half-hour when air temperatures are at or above 80° Fahrenheit (F)] with water freshly taken from the water where the mussels were collected. Containers for temporary holding of mussels must remain in the shade. Specimens must be returned to the locality from which they were taken. No live specimens may be removed from the site. Live specimens that cannot be identified at the site must be photographed for identification purposes and immediately returned to the substrate.
 - I.4. Collection of specimens must be done only when the air temperature is above 32° F and the water temperature is above 40° F. Specimens may be returned to the substrate as follows: 1) for surveys at water temperatures at or above 50° F, mussels may be dropped back into the water after identification; 2) for surveys conducted at water temperatures between 40° F and 50° F, mussels must be returned to the substrate by divers. Divers must return the specimen to the substrate by hand, placing them on their side and allowing them to burrow on their own. Where the substrate is very compacted cobble, a hole just large enough to receive the animal to a depth of 3/4 of its length should be excavated and the mussel placed into it with the posterior end up and pointing upstream. Specimens must be returned unharmed within three hours to the locality where taken, or relocated as authorized by Condition I.6.

- I.5. All live mussels will be measured (length and height) and, if possible, sexed and aged. No intrusive activities are permitted. Random samples will be taken using a 1-m² sampling frame, and sample locations will be determined using a stratified, random design. Data collected will include descriptions of external morphometry and reproductive status.
- I.6. No live specimens may be removed from the survey sites, except for specimens encountered in circumstances which would reasonably be expected to result in stranding due to low or receding water. Such specimens may be moved to a suitable nearby location in deep water and returned to the substrate according to Condition I.4.
- I.7. All specimens collected must be thoroughly inspected for the presence of zebra mussels (*Dreissena polymorpha*). Unionids with zebra mussels attached must be cleaned by scrubbing prior to returning the specimens to the substrate according to Condition I.4. In addition, any Asiatic clams (*Corbicula fluminea*) that are collected during your studies shall be destroyed.
- J. Permittee is authorized to take (only in the context of harass by survey) fish species identified in Attachment 1 for scientific research aimed at recovery of the species. Permittee shall adhere to the following conditions involving presence/absence surveys for fish species:
- J.1. Presence/absence studies and surveys to monitor fish communities shall be conducted conducted by personnel identified in Condition C.2.
- J.2. Permittee may hold specimens for a maximum of 15 minutes for photographic documentation and non-intrusive data collection, and release unharmed at the point of capture.
- J.3. Electrofishing surveys are only authorized by written concurrence of the U.S. Fish and Wildlife Service Field Supervisor for the state in which the activity is proposed.
- K. Permittee shall adhere to the following conditions involving surveys for copperbelly water snake:
- K.1. Activities may be conducted by personnel identified in Condition C.3., and only by visual searches of habitat to assess habitat quality and to determine presence or absence of copperbelly water snake.
- K.2. Time searches shall be based on protocol developed and discussed by Bruce Kingsbury (Attachment 2).
- K.3. Drift fences may also be employed for more quantifiable population estimates.
- L. Upon determination that endangered or threatened species are present at previously undocumented sites, Permittee shall notify the following offices within 48 hours: the U.S. Fish and Wildlife Service Region 3 Office (Condition P.1.), and the USFWS Field Office within the geographic location of study areas (Condition Q.).
- M. No injury or mortality is anticipated or allowed as a result of copperbelly water snake surveys. In the event that injury or mortality occurs, all activities must cease. The circumstances of any injury or mortality must be reported in writing within 48 hours to the office listed in Condition P.1., the USFWS East Lansing, Michigan Field Office (Condition Q.4.a), and the nearest USFWS Law Enforcement, Special Agent Office (<http://www.fws.gov/offices>). Before you reinitiate studies authorized by this permit, you must receive written authorization from the USFWS (Condition P.1.). Dead or moribund specimens may be retained for further study only with the written permission of the USFWS East Lansing, Michigan Field Office. Any specimens that are not authorized for retention are to be chilled and promptly transferred to the USFWS for potential necropsy and/or contaminants analysis (Condition Q.4.a).
- N. Accidental injury and/or mortality of bats, mussels or fish may not exceed two specimens. In the event that this number is met, all activities must cease. Mortality or serious injury to listed specimens must be reported within 5 calendar days to the applicable USFWS office(s) listed in Condition Q. and to the nearest USFWS Law Enforcement, Special Agent Office (<http://www.fws.gov/offices>). Dead or moribund bats may be retained for further study only with the written permission of the USFWS. Bats are to be chilled and promptly transferred to the U.S. Fish and Wildlife Service for potential necropsy and/or contaminants analysis (Condition P.6.). Disposition of any mussels or fish that are accidentally killed shall be completed in accordance with instructions from the Field Supervisor in the state in which the incident occurred (Condition Q.).
- O. An annual report of activities conducted under the authority of this permit is due by January 31 each year the permit is in effect. In addition, copies of all reports and publications resulting from data obtained under this permit must be submitted as they become available. Failure to furnish any reports required by this permit is cause for permit revocation and/or denial of future permit applications. At a minimum, your report must include:

- O.1. The date, time, and geographic locations (including datum and projection information), of all specimens encountered as well as all data collected on the individuals (i.e., age, sex, and weight).
- O.1.a. For bats, your report must include a completed data collection form as found in the Summer Survey Guidelines, Appendix B, cited in Condition H.2., and band numbers of all bats banded.
- O.1.b. Data shall be submitted for all bats captured and include, but not be limited to, the data requested in any automated or species-specific data form provided by the USFWS (e.g., INDIANA BAT SURVEY AND BANDING DATA forms, the data collection forms found in the current Rangewide Indiana Bat Summer Survey Guidelines cited in Condition H.2., or other species specific forms). Photographs of the identifying characteristics for each individual federally-listed species captured are encouraged. The Permittee may be requested to provide individual photographs after submittal of annual reporting data.
- O.2. A description of locations surveyed for threatened/endangered species where no specimens were encountered.
- O.3. Location and characteristics of bat roost trees and bat colonies.
- O.4. Information on any injuries and/or mortalities and disposition of specimens.
- O.5. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.
- O.6. Copies of all site-specific authorization letters required under Condition G.

If no activities occurred over the course of the year, indication of such shall be submitted as an annual report.

- P. Copies of your reports shall be sent to the offices listed below. When possible, electronic copies shall be submitted in lieu of hard copies in MS Word, Rich Text Format, or other file format that is compatible with the receiving office.

P.1. Regional Recovery Permits Coordinator

U.S. Fish and Wildlife Service - Midwest Region (Region 3)
Ecological Services -- Endangered Species
5600 American Blvd. W., Suite 990
Bloomington, Minnesota 55437-1458
(612/713-5343; fax 612/713-5292)
permitsR3ES@fws.gov

P.2. Regional Recovery Permits Coordinator

U.S. Fish and Wildlife Service - Southeast Region (Region 4)
Endangered Species Permits Office
1875 Century Blvd., Suite 200
Atlanta, Georgia 30345-3301
(404/679-7140; fax 404/679-7081)
permitsR4ES@fws.gov

P.3. Regional Recovery Permits Coordinator

U.S. Fish and Wildlife Service - Northeast Region (Region 5)
Endangered Species Division
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589
(703/358-2402; fax 413/253-8482)
permitsR5ES@fws.gov

P.4. Regional Recovery Permits Coordinator

U.S. Fish and Wildlife Service - Southwest Region (Region 2)
Endangered Species Permits Office
P.O. Box 1306
Albuquerque, New Mexico 87103-1306
(505/248-6649; fax 505/248-6788)
permitsR2ES@fws.gov

P.5. ESA Assistant Recovery Coordinator & Permit Coordinator

U.S. Fish and Wildlife Service - Mountain-Prairie Region (Region 6)

Endangered Species Permits Office
Denver Federal Center, P.O. Box 25486
Denver, Colorado 80225-0489
(719/628-2670; fax 303/236-0027)
permitsR6ES@fws.gov

P.6. For all studies involving Indiana bat:

Lori Pruitt
Endangered Species Coordinator
U.S. Fish and Wildlife Service
Ecological Services Field Office
620 S. Walker Street
Bloomington, Indiana 47403-2121
(812/334-4261 x1213; fax 812/334-4273)

Q. Additionally, based on geographic area, reports and publications shall be submitted to the following:

Q.1. For studies conducted in Illinois:

Q.1.a. Kristen Lundh
Endangered Species Coordinator for Illinois/Iowa
U.S. Fish and Wildlife Service
Ecological Services Field Office
1511 47th Avenue
Moline, Illinois 61265
(309/757-5800, x215; fax 309/757-5807)

Q.1.b. Joseph A. Kath
Endangered Species Manager/Bat Specialist
Illinois Department of Natural Resources
One Natural Resource Way
Springfield, Illinois 62702-1271
(217/785-8764; fax 217/785-2438)

Q.2. For studies conducted in Indiana:

Q.2.a. Lori Pruitt
Endangered Species Coordinator
U.S. Fish and Wildlife Service
Ecological Services Field Office
620 S. Walker Street
Bloomington, Indiana 47403-2121
(812/334-4261 x1213; fax 812/334-4273)

Q.2.b. Scott Johnson
Indiana Department of Natural Resources
Division of Fish and Wildlife
402 W. Washington Street, Room W273
Indianapolis, Indiana 46204-2781
(317/234-9586; fax 317/232-8150)

Q.3. For studies conducted in Iowa:

Q.3.a. Kristen Lundh
Endangered Species Coordinator
U.S. Fish and Wildlife Service
Ecological Services Field Office
1511 47th Avenue
Moline, Illinois 61265
(309/757-5800, x215; fax 309/757-5807)

Q.3.b. Kelly Poole

Endangered Species Coordinator
Iowa Department of Natural Resources
Parks, Recreation, and Preserves
Wallace State Office Building
East 9th and Grand Avenue
Des Moines, Iowa 50319-0034
(515/281-8463)

Q.4. For studies conducted in Michigan:

Q.4.a. Jack Dingledine
Deputy Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services Field Office
2651 Coolidge Road, Suite 101
East Lansing, Michigan 48823
(517/351-6326; fax 517/351-1443)

Q.4.b. Dan Kennedy
Endangered Species Coordinator
Michigan Department of Natural Resources
Wildlife Division
P.O. Box 30444
Lansing, Michigan 48909-7444
(517/284-6194; fax 517/373-6705)

Q.5. For studies conducted in Missouri:

Q.5.a. Shauna Marquardt
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Ecological Services Field Office
101 Park DeVille Drive, Suite A
Columbia, Missouri 65203-2132
(573/234-2132; fax 573/234-2181)

Q.5.b. Tara Jennings
Scientific Collecting Permit Coordinator
Missouri Department of Conservation
Endangered Species and Natural History Division
2901 W. Truman Blvd.
P.O. Box 180
Jefferson City, Missouri 65102-0180
(573/751-4115 ext. 3322; fax 573/751-4864)

Q.6. For studies conducted in Ohio:

Q.6.a. Angela Boyer
Endangered Species Coordinator
U.S. Fish and Wildlife Service
Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614/416-8993, x22; fax 614/416-8994)

Q.6.b. Kate Haley Parsons
Terrestrial Endangered Species & Wildlife Diversity Program Administrator
Ohio Department of Natural Resources
Division of Wildlife
2045 Morse Road, Building G3
Columbus, Ohio 43229-6693
(614/265-6329; fax 614/262-1143)

Q.6.c. John Navarro
Aquatic Program Administrator
Ohio Department of Natural Resources
Division of Wildlife
2045 Morse Road, Building G3
Columbus, Ohio 43229-6693
(614/265-6346; fax 614/262-1143)

Q.7. For studies conducted in Minnesota and Wisconsin:

Q.7.a. Phil Delphey
Endangered Species Coordinator
U.S. Fish and Wildlife Service
Ecological Services Field Office
4101 American Blvd. E.
Bloomington, Minnesota 55425
(952/252-0092 x206; fax 952/646-2873)

Q.7.b. Owen Boyle
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707-7921
(608/266-5244; fax 608/266-2925)

Q.7.c. Richard Baker
Endangered Species Coordinator
Minnesota Department of Natural Resources
Division of Ecological and Water Resources
500 Lafayette Road, Box 25
St. Paul, Minnesota 55155
(651/259-5073)

Q.8. For studies conducted in Alabama:

U.S. Fish and Wildlife Service
Daphne Field Office
Field Supervisor
1208-B Main Street
Daphne, Alabama 36526
(251/441-5181)

Q.9. For studies conducted in Arkansas:

U.S. Fish and Wildlife Service
Arkansas Field Office
Field Supervisor
110 South Amity, Suite 300
Conway, Arkansas 72032-8975
(501/513-4470)

Q.10. For studies conducted in Connecticut, Massachusetts, New Hampshire, Rhode Island and Vermont:

U.S. Fish and Wildlife Service
New England Field Office
Field Supervisor
70 Commercial Street, Suite 300
Concord, New Hampshire 03301
(603/223-2541)

Q.11. For studies conducted in Delaware and Maryland:

U.S. Fish and Wildlife Service

Chesapeake Bay Field Office
Field Supervisor
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
(410/573-4573)

Q.12. For studies conducted in Texas:

U.S. Fish and Wildlife Service
Arlington Field Office
Field Supervisor
2005 NE Green Oaks Blvd, Suite 140
Arlington, Texas 76006-3247

Q.13. For studies conducted in Georgia:

U.S. Fish and Wildlife Service
Georgia Field Office
Field Supervisor
105 West Park Drive, Suite D
Athens, Georgia 30606-3175
(706/613-9493; fax 706/613-6059)

Q.14. For studies conducted in Kansas:

U.S. Fish and Wildlife Service
Kansas Field Office
Field Supervisor
2609 Anderson Avenue
Manhattan, Kansas 68502
(785/539-3474; fax 785/539-8567)

Q.15. For studies conducted in Kentucky:

U.S. Fish and Wildlife Service
Frankfort Field Office
Field Supervisor
J C Watts Federal Bldg., Room 265
330 West Broadway
Frankfort, Kentucky 40601-8670
(502/695-0468)

Q.16. For studies conducted in Louisiana:

U.S. Fish and Wildlife Service
Louisiana Field Office
Field Supervisor
646 Cajundome Blvd., Suite 400
Lafayette, Louisiana 70506-4290
(337/291-3100)

Q.17. For studies conducted in Maine:

U.S. Fish and Wildlife Service
Maine Field Office
Field Supervisor
17 Godfrey Drive, Suite 2
Orono, Maine 04473-3702
(207/866-3344)

Q.18. For studies conducted in Mississippi:

U.S. Fish and Wildlife Service

Mississippi Field Office
Field Supervisor
6578 Dogwood View Pkwy, Suite A
Jackson, Mississippi 39213-7856
(601/321-1122)

Q.19. For studies conducted in Montana:

U.S. Fish and Wildlife Service
Montana Field Office
Field Supervisor
585 Shepard Way
Helena, Montana 59601
(406/449-5225)

Q.20. For studies conducted in Nebraska:

U.S. Fish and Wildlife Service
Nebraska Field Office
Field Supervisor
9325 South Alda Road
Wood River, Nebraska 68883
(308/382-6468)

Q.21. For studies conducted in New Jersey:

U.S. Fish and Wildlife Service
New Jersey Field Office
Field Supervisor
927 N. Main Street, Building D
Pleasantville, New Jersey 08232-1454
(609/646-9310)

Q.22. For studies conducted in New York:

U.S. Fish and Wildlife Service
New York Field Office
Field Supervisor
3817 Luker Road
Cortland, New York 13045
(607/753-9334)

Q.23. For studies conducted in North Carolina:

U.S. Fish and Wildlife Service
Asheville Field Office
Field Supervisor
160 Zillicoa Street
Asheville, North Carolina 28801-1082
(828/258-3939)

Q.24. For studies conducted in North Dakota

U.S. Fish and Wildlife Service
North Dakota Field Office
Field Supervisor
3425 Miriam Avenue
Bismarck, North Dakota 58501-7926
(701/250-4481)

Q.25. For studies conducted in Oklahoma:

U.S. Fish and Wildlife Service

Oklahoma Field Office
Field Supervisor
9014 E. 21st Street
Tulsa, Oklahoma 74129-1428
(918/382-4501)

Q.26. For studies conducted in Pennsylvania:

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Field Supervisor
315 S. Allen Street, Suite 322
State College, Pennsylvania 16801-4850
(814/234-4090)

Q.27. For studies conducted in South Carolina:

U.S. Fish and Wildlife Service
Charleston Field Office
Field Supervisor
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407-7558
(843/727-4707 x212)

Q.28. For studies conducted in South Dakota

U.S. Fish and Wildlife Service
South Dakota Field Office
Field Supervisor
420 S. Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408
(605/224-8693)

Q.29. For studies conducted in Tennessee:

U.S. Fish and Wildlife Service
Cookeville Field Office
Field Supervisor
446 Neal Street
Cookeville, Tennessee 38501-4027
(931/528-6481)

Q.30. For studies conducted in Virginia:

U.S. Fish and Wildlife Service
Virginia Field Office
Field Supervisor
6669 Short Lane
Gloucester, Virginia 23061
(804/693-6694)

Q.31. For studies conducted in West Virginia:

U.S. Fish and Wildlife Service
West Virginia Field Office
Field Supervisor
Route 250 South, Elkins Shopping Plaza
694 Beverly Pike
Elkins, West Virginia 26241
(304/636-6586)

Q.32. For studies conducted in Wyoming:

U.S. Fish and Wildlife Service
Wyoming Field Office
Field Supervisor
5353 Yellowstone Road, Suite 308A
Cheyenne, Wyoming 82009
(307/772-2374)

cc: FWS/Regions 2, 4, 5, and 6 (Attn: Recovery Permits Coordinator)
FWS, TE Coordinators for IL, IN, IA, MI, MN, MO, OH, and WI
DNR/DOC, TE Administrator/Coordinators for IL, IN, IA, MI, MN, MO, OH, and WI

END

Stantec Consulting Services, Inc.
Attachment 1 to Fish and Wildlife Permit TE38821A-1

Fish

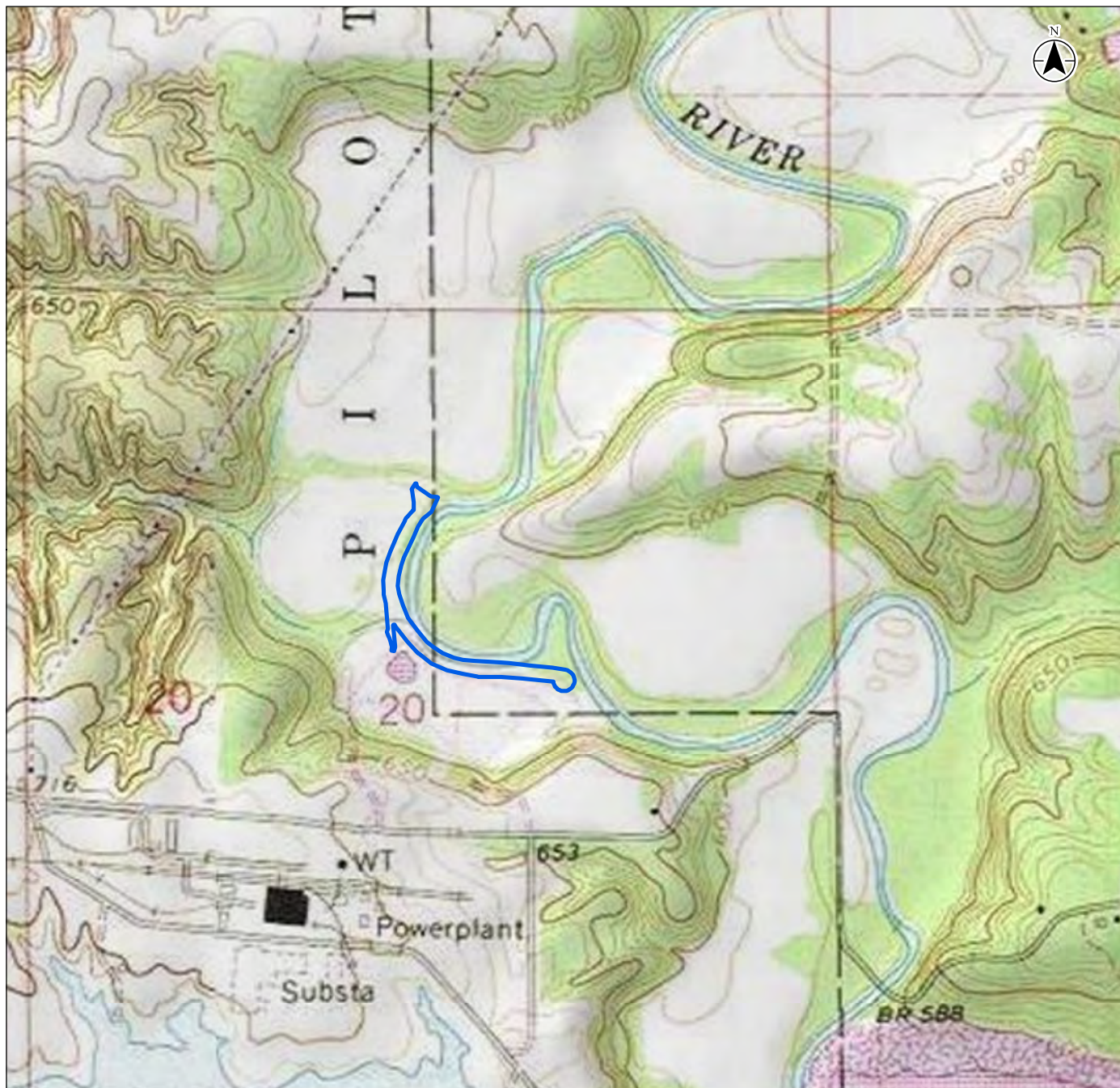
<i>Etheostoma chienense</i>	Relict darter
<i>Etheostoma percnurum</i>	Duskytail darter
<i>Notropis albizonatus</i>	Palezone shiner
<i>Phoxinus cumberlandensis</i>	Blackside dace
<i>Scaphirhynchus albus</i>	Pallid sturgeon

Mussels

<i>Alasmodonta atropurpurea</i>	Cumberland elktoe
<i>Conradilla caelata</i>	Birdwing pearlymussel
<i>Cumberlandia monodonta</i>	Spectaclecase
<i>Cyprogenia stegaria</i>	Fanshell
<i>Dromus dromas</i>	Dromedary pearlymussel
<i>Epioblasma brevidens</i>	Cumberland combshell
<i>Epioblasma capsaeformis</i>	Oyster mussel
<i>Epioblasma florentina walkeri</i>	Tan riffleshell
<i>Epioblasma obliquata obliquata</i>	Purple catpaw
<i>Epioblasma torulosa rangiana</i>	Northern riffleshell
<i>Epioblasma triquetra</i>	Snuffbox
<i>Fusconaia cuneolus</i>	Finerayed pigtoe
<i>Fusconaia cor</i>	Shiny pigtoe
<i>Hemistena lata</i>	Cracking pearlymussel
<i>Lampsilis abrupta</i>	Pink mucket
<i>Lampsilis higginsii</i>	Higgins eye
<i>Obovaria retusa</i>	Ring pink
<i>Pegias fibula</i>	Littlewing pearlymussel
<i>Plethobasus cicatricosus</i>	White wartyback pearlymussel
<i>Plethobasus cooperianus</i>	Orangefoot pimpleback
<i>Plethobasus cyphus</i>	Sheepnose
<i>Pleurobema clava</i>	Clubshell
<i>Pleurobema plenum</i>	Rough pigtoe
<i>Pleuonaia dolabelloides</i>	Slabside pearlymussel
<i>Potamilus capax</i>	Fat pocketbook
<i>Ptychobranhus subtentum</i>	Fluted kidneyshell
<i>Quadrula cylindrica cylindrica</i>	Rabbitsfoot
<i>Quadrula cylindrica strigillata</i>	Rough rabbitsfoot
<i>Villosa fabalis</i>	Rayed bean
<i>Villosa perpurpurea</i>	Purple bean
<i>Villosa trabilis</i>	Cumberland bean

APPENDIX B

Figures



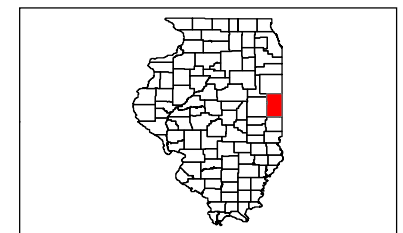
Legend

— Project Area



Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Base Imagery: ESRI Map Services.



Project Location 123456789
Vermilion Co., IL Prepared by EKD on 2018-11-08
Technical Review by WCF on 2018-11-XX
Independent Review by DS on 2018-11-XX

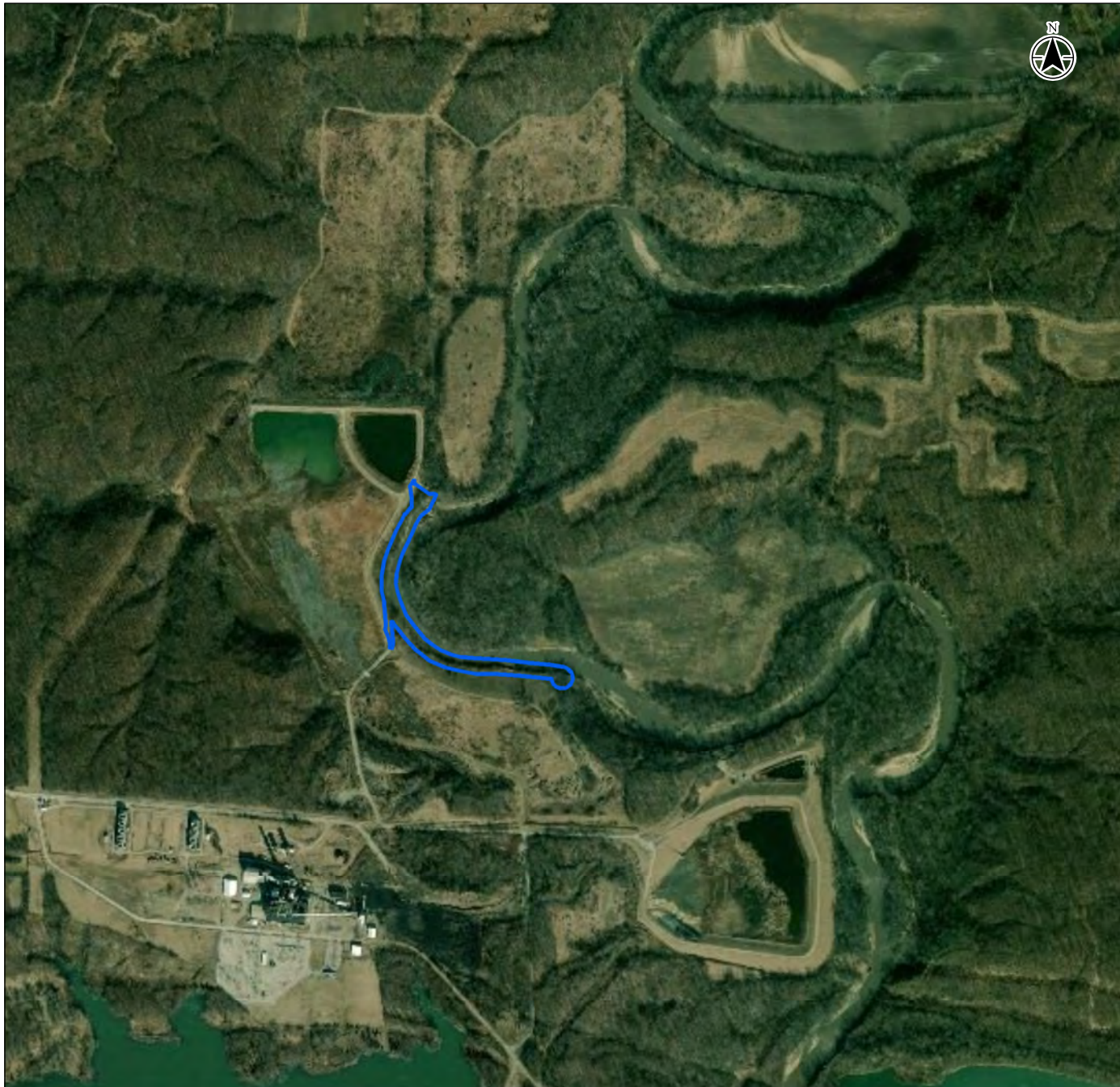
Client/Project
Dynegy Midwest Generation, LLC
Middle Fork Vermillion River
Conservation Plan

Figure No.

1

Title

Project Location Map



Stantec



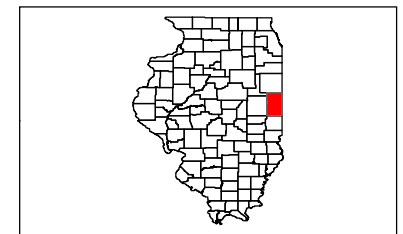
Legend

— Project Area

0 800 1,600
Feet
1:16,000 (At original document size of 8.5x11)

Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Base Imagery: ESRI Map Services.



Project Location 123456789
Vermilion Co., IL Prepared by EKD on 2018-11-08
Technical Review by WCF on 2018-11-XX
Independent Review by DS on 2018-11-XX

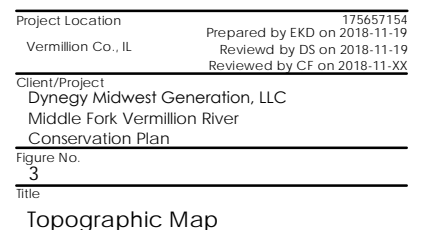
Client/Project
Dynegy Midwest Generation, LLC
Middle Fork Vermilion River
Conservation Plan

Figure No.

2

Title

Project Location Map
Aerial Imagery



APPENDIX C

Agency Correspondence



Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

Bruce Rauner, Governor

Wayne A. Rosenthal, Director

November 19, 2018

Mr. Phil Morris
Vistra Energy
1500 Eastport Plaza Drive
Collinsville, IL62234

**RE: Middle Fork Vermilion River Bank Stabilization
Endangered Species Consultation Program
EcoCAT Review # 1903080**

Dear Mr. Morris:

This letter is regarding a consultation for EcoCAT #1903080 submitted for an IEPA review. The project was reviewed pursuant to the *Illinois Endangered Species Protection Act* [520 ILCS 10/11], the *Illinois Natural Areas Preservation Act* [525 ILCS 30/17], and Title 17 *Illinois Administrative Code* Part 1075. Additionally, the Department may offer advice and recommendations for species covered under the *Fish & Aquatic Life Code* [515 ILCS 5, *et seq.*]; the *Illinois Wildlife Code* [520 ILCS 5, *et seq.*]; and the *Herptiles-Herps Act* [510 ILCS 69].

The project is located approximately at the coordinates 40.18307°N, -87.74537°W, at 10188 E 2050N in Oakwood, IL. The proposed action consists of approximately 1900 linear feet of river bank stabilization along the right descending bank of the Middle Fork, Vermilion River at the Dynegy Midwest Generation - Vermilion site. Proposed work includes laying back the embankments and the construction access bench at the toe of embankment. Stabilization methods will include a combination of stone toe protection, embedded toe boulders, void filled riprap, and live branch layering. The existing gabion baskets will be removed.

Freshwater Mussels

A survey¹ to determine the presence and density of mussel species within the vicinity of the proposed project was conducted on September 16 and 17 of 2018. The survey collected 33 live individuals representing eight species. Additionally, 140 weathered (dead) or subfossil specimens were identified, representing an additional 16 species. Species of note collected during the survey include the six-live state-endangered **Wavy-Rayed Lampmussels** (*Lampsilis fasciola*) and one weathered shell of the state and federally-endangered Northern **Riffleshell** (*Epioblasma rangiana*) in the project area. The Illinois Natural History Survey (INHS)

¹ Draft Freshwater Mussel Survey on the Middle Fork Vermilion River at the Illinois Power Company Vermillion Station (River Mile 8.1), Vermillion County, Illinois, October 2018. Stantec Consulting Services Inc.

translocating 686 Northern Riffleshells between 2013-2014 from Pennsylvania to four sites on the Middle Fork Vermilion River, upstream of the project area. The weathered shell is considered to be from this translocated population and the Department considers it is possible for live individuals to occur in the project area.

Given the scope of the project, the Department has determined that a high likelihood of “take,” as defined under the *Illinois Endangered Species Protection Act [520 ILCS 10/2]*, exists for Wavy-Ray Lampshell and take of Northern Riffleshell is also possible considering a translocated population exists upstream. The Department recommends Vistra Energy seek an Incidental Take Authorization (ITA) for these species’ pursuant to *Part 1080* and *Section 5.5* of the *Illinois Endangered Species Protection Act*.

However, due to the status of the Northern Riffleshell mussel being listed as federally-endangered, the Department cannot issue such an ITA until after the U.S. Fish and Wildlife Service (USFWS) has issued a federal Incidental Take Permit (ITP) for the species pursuant to *Section 10* of the federal *Endangered Species Act*. Please contact the USFWS for further guidance on a federal ITP.

Fish

During the mussel survey conducted in October of 2018, the state-endangered **Bluebreast Darter (*Etheostoma caeruleum*)** was observed in the project area. Upon further review of the habitat, location, and existing data, the Department has determined that the state-endangered **Bigeye Chub (*Hybopsis amblops*)** and state-threatened **Eastern Sand Darter (*Ammocrypta pellucida*)** are also likely to be in the vicinity of the project. The Department recommends that Vistra Energy pursue an ITA for Bluebreast Darter, Bigeye Chub, and Eastern Sand Darter.

Bats

A bat habitat assessment was performed in the project area on February 27, 2018. It was determined based onsite characteristics and surrounding land use, that the project area has low suitability as **Indiana Bat (*Myotis sodalis*)** or **Northern Long-Eared Bat (*Myotis septentrionalis*)** summer roosting habitat. However, the Department recommends that all suitable habitat trees be removed between October 15th and March 31st. Suitable habitat tree species include but are not limited to, shagbark and shellbark hickory, bitternut hickory, green ash, American elm, slippery elm, eastern cottonwood, silver maple, sugar maple, white oak, red oak, post oak, and shingle oak. This includes trees that are dead, dying, broken, or damaged, with slabs or plates of loose or peeling bark on the trunks or limbs. All non-suitable trees may be cut at any time.

For additional information on applying for an ITA, the project applicant should visit the link below. Be advised, an ITA can take at least four months to process and requires a public notice period. All questions pertaining to ITA should be directed to the ITA coordinator, Jenny Skufca at jenny.skufca@illinois.gov.

ITA Application Link:

<https://www.dnr.illinois.gov/conservation/NaturalHeritage/Pages/ApplyingforanIncidentalTakeAuthorization.aspx>

In accordance with 17 Ill. Adm. Code 1075.40(h), please notify the Department of your decision regarding these recommendations. Consultation on the part of the Department is closed unless the applicant desires additional information or advice related to this proposal. Consultation for Part 1075 is valid for two years unless new information becomes available which was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the action has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal and should not be regarded as a final statement on the project being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are unexpectedly encountered during the project's implementation, the applicant must comply with the applicable statutes and regulations. Please contact me with any questions about this review.

Sincerely,

Bradley Hayes
Resource Planner
Impact Assessment Section
Department of Natural Resources
(217) 787-0031
bradley.hayes@illinois.gov

cc. Jenny Skufca – IDNR, ORC - Incidental Take Authorization Coordinator
Sgt. Eric Rollins – IDNR - Conservation Police
Trent Thomas – IDNR, Fisheries
Matt Mangan, USFWS, Southern Illinois Sub-Office
Sarah Keller – USACE, Louisville District

Applicant: Vistra Energy
Contact: Phil Morris
Address: 1500 Eastport Plaza Drive
Collinsville, IL 62234

IDNR Project Number: 1903080
Date: 09/18/2018
Alternate Number: 1811584

Project: Middle Fork Vermilion River Bank Stabilization
Address: Middle Fork Vermilion River, Oakwood

Description: The project will stabilize approximately 1,900 linear feet (LF) of the riverbank. This portion of the Middle Fork Vermilion River is experiencing erosion along the right descending bank within the northern portion of the Vermilion Site, located near Oakwood, Illinois.

Natural Resource Review Results

Consultation for Endangered Species Protection and Natural Areas Preservation (Part 1075)

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Kennekuk Cove County Park INAI Site
Middle Fork Of The Vermilion River INAI Site
Orchid Hill INAI Site
Vermilion040 INAI Site
Kickapoo Hill Prairie Land And Water Reserve
Orchid Hill Natural Heritage Landmark
Bluebreast Darter (*Etheostoma camurum*)
Bluebreast Darter (*Etheostoma camurum*)
Clubshell (*Pleurobema clava*)
Fibrous-Rooted Sedge (*Carex communis*)
Little Spectaclecase (*Villosa lienosa*)
Northern Riffleshell (*Epioblasma torulosa rangiana*)
Purple Wartyback (*Cyclonaias tuberculata*)
Salamander Mussel (*Simpsonaias ambigua*)
Wavy-Rayd Lampmussel (*Lampsilis fasciola*)
Wavy-Rayd Lampmussel (*Lampsilis fasciola*)

An IDNR staff member will evaluate this information and contact you to request additional information or to terminate consultation if adverse effects are unlikely.

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Vermilion

Township, Range, Section:
20N, 12W, 20



IL Department of Natural Resources
Contact
Bradley Hayes
217-785-5500
Division of Ecosystems & Environment

Government Jurisdiction
IL Environmental Protection Agency
Scott Twait
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

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From: Metzke, Brian
To: [Symonds, Daniel](#)
Cc: [Fleece, Cody](#); [Morris, Phil](#); [Sridhar, Paul](#); [Matthew_Mangan@fws.gov](#); [Skufca, Jenny](#)
Subject: RE: Middle Fork Vermilion River Mussel & Fish Relocation Plan
Date: Wednesday, July 10, 2019 10:35:03 AM

Dan,

Thank you for incorporating our recommendations into this mussel and fish relocation plan. I concur with this plan. Good luck, and I look forward to the reading the outcome.

Brian Metzke
State Aquatic Ecologist
Aquatic Ecology Program, IDNR Division of Natural Heritage
1 Natural Resources Way
Springfield, IL 62702
Office: 217-557-9251
Cell: 217-836-0680
brian.metzke@illinois.gov

From: Symonds, Daniel <Daniel.Symonds@stantec.com>
Sent: Tuesday, July 9, 2019 5:13 PM
To: Metzke, Brian <Brian.Metzke@Illinois.gov>
Cc: Fleece, Cody <Cody.Fleece@stantec.com>; Morris, Phil <Phil.Morris@vistraenergy.com>; Sridhar, Paul <Paul.Sridhar@stantec.com>; Matthew_Mangan@fws.gov; Skufca, Jenny <Jenny.Skufca@Illinois.gov>
Subject: [External] Middle Fork Vermilion River Mussel & Fish Relocation Plan

Hello Brian,

Attached is our proposed relocation plan for fish and mussels on the Middle Fork Vermilion River related to river stabilization work. We are submitting this for your review and authorization to proceed. Please let me know if you have any questions, comments, or concerns.

Thank you for your time and attention,
Dan Symonds

Daniel Symonds

Aquatic Ecologist

Direct: 614 282-3215

Daniel.Symonds@stantec.com

Stantec

1500 Lake Shore Drive Suite 100

Columbus OH 43204-3800



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Applicant: Angela Sjollema
Contact: Angela L Sjollema
Address: 1500 Lake Shore Drive
Suite 100
Columbus, OH 43204

IDNR Project Number: 2213741
Date: 05/31/2022

Project: Middle Fork Vermilion River Erosion and Streambank Stabilization
Address: 9743-9707 E 2150 North Road, Danville

Description: The proposed action will include potential installation of one or more lateral erosion control structures.

Natural Resource Review Results

This project was submitted for information only. It is not a consultation under Part 1075.

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Kennekuk Cove County Park INAI Site
Kickapoo Hill Prairie INAI Site
Middle Fork Of The Vermilion River INAI Site
Orchid Hill INAI Site
Kickapoo Hill Prairie Land And Water Reserve
Orchid Hill Natural Heritage Landmark
Bigeye Chub (*Hybopsis amblops*)
Bluebreast Darter (*Etheostoma camurum*)
Bluebreast Darter (*Etheostoma camurum*)
Clubshell (*Pleurobema clava*)
Northern Riffleshell (*Epioblasma torulosa rangiana*)
Purple Wartyback (*Cyclonaias tuberculata*)
Salamander Mussel (*Simpsonaias ambigua*)
Short-Eared Owl (*Asio flammeus*)
Wavy-Rayed Lampmussel (*Lampsilis fasciola*)
Wavy-Rayed Lampmussel (*Lampsilis fasciola*)

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Vermilion

Township, Range, Section:
20N, 12W, 20



IL Department of Natural Resources

Contact

Impact Assessment Section

217-785-5500

Division of Ecosystems & Environment

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

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1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

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EcoCAT Receipt

Project Code 2213741

APPLICANT	DATE
Angela Sjollema Angela L Sjollema 1500 Lake Shore Drive Suite 100 Columbus, OH 43204	5/31/2022

DESCRIPTION	FEE	CONVENIENCE FEE	TOTAL PAID
EcoCAT Consultation	\$ 25.00	\$ 1.00	\$ 26.00
TOTAL PAID			\$ 26.00

Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702
217-785-5500
dnr.ecocat@illinois.gov

APPENDIX D

Verification of Funding and Implementing Agreement



Dianna Tickner
Asset Closure
Luminant
1500 Eastport Plaza Drive
Collinsville, Illinois, 62234
o 618.343.7929
m 618.381.3124

Illinois Department of Natural Resources
Office of Realty & Capital Planning
One Natural Resources Way
Springfield, Illinois 62702-1271
ATTN: Jeannie Skufca

December 21, 2018

RE: Middle Fork Vermilion River Erosion Mitigation and Streambank Stabilization – Conservation Plan
Addendum to include Verification of Funding and Implementation Agreement

Ms. Skufca,

As an addendum to the Middle Fork Vermilion River (MFVR) conservation plan, Dynegy Midwest Generation, LLC offers the following:

Verification of funding:

Dynegy Midwest Generation (DMG), LLC will fully fund the Middle Fork Vermilion River (MFVR) erosion mitigation and streambank stabilization project. DMG, LLC will also fund, support, and implement all activities described in the MFVR conservation plan.

Implementation Agreement:

- Names and signatures of all participants in the execution of the conservation plan:

DMG, LLC

Dianna Tickner, P.E.
Director – Asset Closure
1500 Eastport Plaza Drive
Collinsville, Illinois, 62234
Office: 618-343-7929
Mobile: 618-381-2124
Dianna.Tickner@vistraenergy.com

Signature of this participant is included at the end of this formal letter.

- The obligations and responsibilities of each of the identified participants:

The Illinois Department of Natural Resources is responsible for the review of the conservation plan and the subsequent issuance of the incidental take authorization (ITA).

DMG, LLC is ultimately responsible for securing authorization for the incidental take and for implementing the MFVR conservation plan, which will include hiring Stantec Consultation Services, Inc. (Stantec) to conduct a mussel survey and relocation, prior to construction, and to conduct a fish relocation after cofferdam installation and before dewatering. DMG LLC is also responsible for securing all necessary permits, for the MFVR erosion mitigation and streambank stabilization project.

For further clarification, Stantec is the consulting company retained by DMG, LLC to conduct the September 2018 mussel survey; prepare the conservation plan; and assist with implementing the conservation plan.

As discussed in the conservation plan, project construction is anticipated to start in June 2019, after issuance of the ITA and after mussel relocation. Fish will be relocated after cofferdam installation and before dewatering. Project completion is anticipated in May 2020.

- Certification that each participant in the execution of the conservation plan has the legal authority to carry out their respective obligations and responsibilities under the conservation plan:

By DMG, LLC's signature, DMG, LLC certifies that prior to starting work on the project, DMG, LLC will obtain all necessary permits, authorizations, and permissions to carry out the obligations and responsibilities under the conservation plan.

- Assurance of compliance with all federal, state, and local regulations pertinent to the proposed action and to execution of conservation plan:

DMG, LLC and its contractors will comply with all federal, state, and local regulations. DMG, LLC and its contractors will comply with all conditions and requirements associated with the authorizations and permits, obtained to execute this project and this conservation plan.

- Copies of any final federal authorizations for a taking, already issued to the applicant:

During the September 2018 mussel survey, spent shells of the federally-endangered mussel species *Epioblasma rangiana* were identified. As a result, DMG, LLC will be drafting and submitting a biological assessment to the United States Fish and Wildlife, in application for a ITA. Upon receipt, the federal ITA will be forwarded to your office.

If you have any questions or concerns, please contact Mr. Phil Morris, a member of our Corporate Environmental team, at phil.morris@vistraenergy.com or (618) 343-7794.

Sincerely,

Dynegy Midwest Generation, LLC



Dianna Tickner

Director – Asset Closure

Date of signature: 20 December 2018



Dianna Tickner
Asset Closure
Luminant
1500 Eastport Plaza Drive
Collinsville, Illinois, 62234
o 618.343.7929
m 618.381.3124

Illinois Department of Natural Resources
Office of Realty & Capital Planning
One Natural Resources Way
Springfield, Illinois 62702-1271
ATTN: Heather Osborn

January 2, 2025

RE: Middle Fork Vermilion River Erosion Mitigation and Streambank Stabilization – Revised Conservation Plan
Addendum to include Verification of Funding and Implementation Agreement

Ms. Heather Osborn,

As an addendum to the Middle Fork Vermilion River (MFVR) conservation plan, Dynegy Midwest Generation, LLC offers the following:

Verification of funding:

Dynegy Midwest Generation (DMG), LLC will fully fund the Middle Fork Vermilion River (MFVR) erosion mitigation and streambank stabilization project. DMG, LLC will also fund, support, and implement all activities described in the revised MFVR conservation plan.

Implementation Agreement:

- Names and signatures of all participants in the execution of the conservation plan:

DMG, LLC

Dianna Tickner, P.E.
Senior Director – Demolition and Decommission
1500 Eastport Plaza Drive
Collinsville, Illinois, 62234
Office: 618-343-7929
Mobile: 618-381-2124
Dianna.Tickner@vistraenergy.com

Signature of this participant is included at the end of this formal letter.

- The obligations and responsibilities of each of the identified participants:

The Illinois Department of Natural Resources is responsible for the review of the revised conservation plan and the subsequent issuance of the incidental take authorization (ITA).

DMG, LLC is ultimately responsible for securing authorization for the incidental take and for implementing the revised MFVR conservation plan, which will include hiring Stantec Consultation Services, Inc. (Stantec) to conduct a mussel survey and relocation, prior to construction. Also, as described in the revised MFVR conservation plan, Stantec will assess the fish community, using a before-after/control-impact design. DMG LLC is also responsible for securing all necessary permits, for the MFVR erosion mitigation and streambank stabilization project.

For further clarification, Stantec is the consulting company retained by DMG, LLC to conduct the September 2018 mussel survey; prepare the revised conservation plan; and assist with implementing the revised conservation plan.

As discussed in the revised conservation plan, project construction is anticipated to start when the factor of safety (FoS) reaches 1.5 and after mussel relocation.

- Certification that each participant in the execution of the conservation plan has the legal authority to carry out their respective obligations and responsibilities under the conservation plan:

In January 2024, U.S. Army Corps of Engineers (USACE) has issued a 404 permit. Illinois Environmental Protection Agency (IEPA) issued an associated 401 certification. IDNR has issued floodplain and dam safety permits as well. The U.S. Fish and Wildlife Service (USFWS) issued a biological opinion in 2019. As included in the January 2024 issued 404 permit, US National Park Service issued a section 7(a) evaluation and determination letter, approving the Project. Furthermore, IEPA approved the First Amended Safety and Emergency Response Plan in June 2023, approving the erosion plans.

- Assurance of compliance with all federal, state, and local regulations pertinent to the proposed action and to execution of conservation plan:

DMG, LLC and its contractors will comply with all federal, state, and local regulations. DMG, LLC and its contractors will comply with all conditions and requirements associated with the authorizations and permits, obtained to execute this project and this revised conservation plan.

- Copies of any final federal authorizations for a taking, already issued to the applicant:

During the September 2018 mussel survey, spent shells of the federally-endangered mussel species *Epioblasma rangiana* were identified. As a result, DMG, LLC had previously prepared and submitted a biological assessment to USFW. USFW issued a biological opinion in 2019.

If you have any questions or concerns, please contact Mr. Phil Morris, a member of our Corporate Environmental team, at phil.morris@vistraenergy.com or (618) 343-7794.

Sincerely,

Dynegy Midwest Generation, LLC



Dianna Tickner

Senior Director – Demolition and Decommission

Date of signature: 02 JANUARY 2025

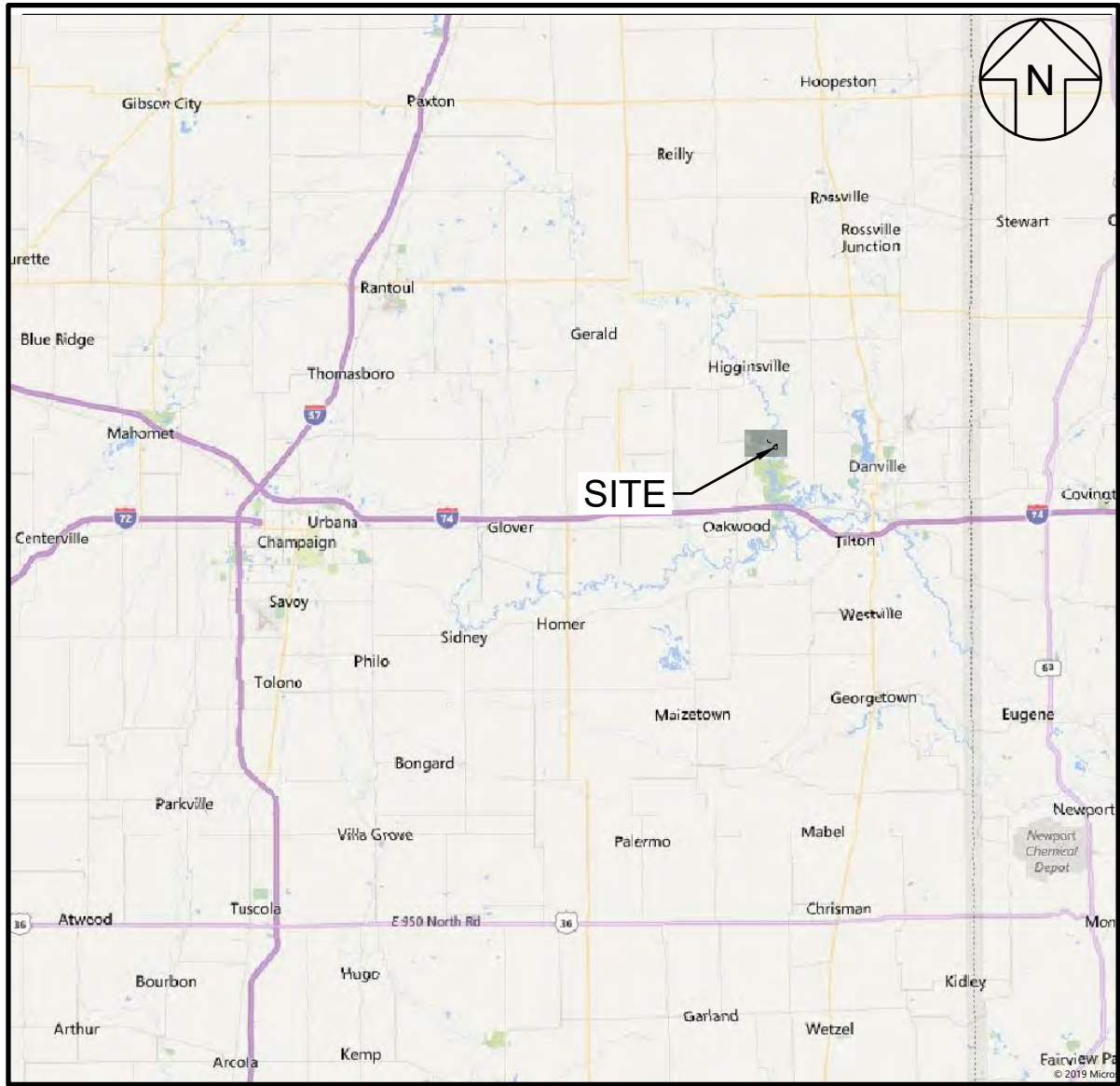
APPENDIX E

Erosion Mitigation Riprap Design, dated July 2023

P:\V\CH8404 VPS CLOSURE\DRAWINGS\EROSION MITIGATION RIPRAP DESIGN\1-CH8404-001 COVER SHEET.DWG Last Edited by: DWalkins on 6/19/23

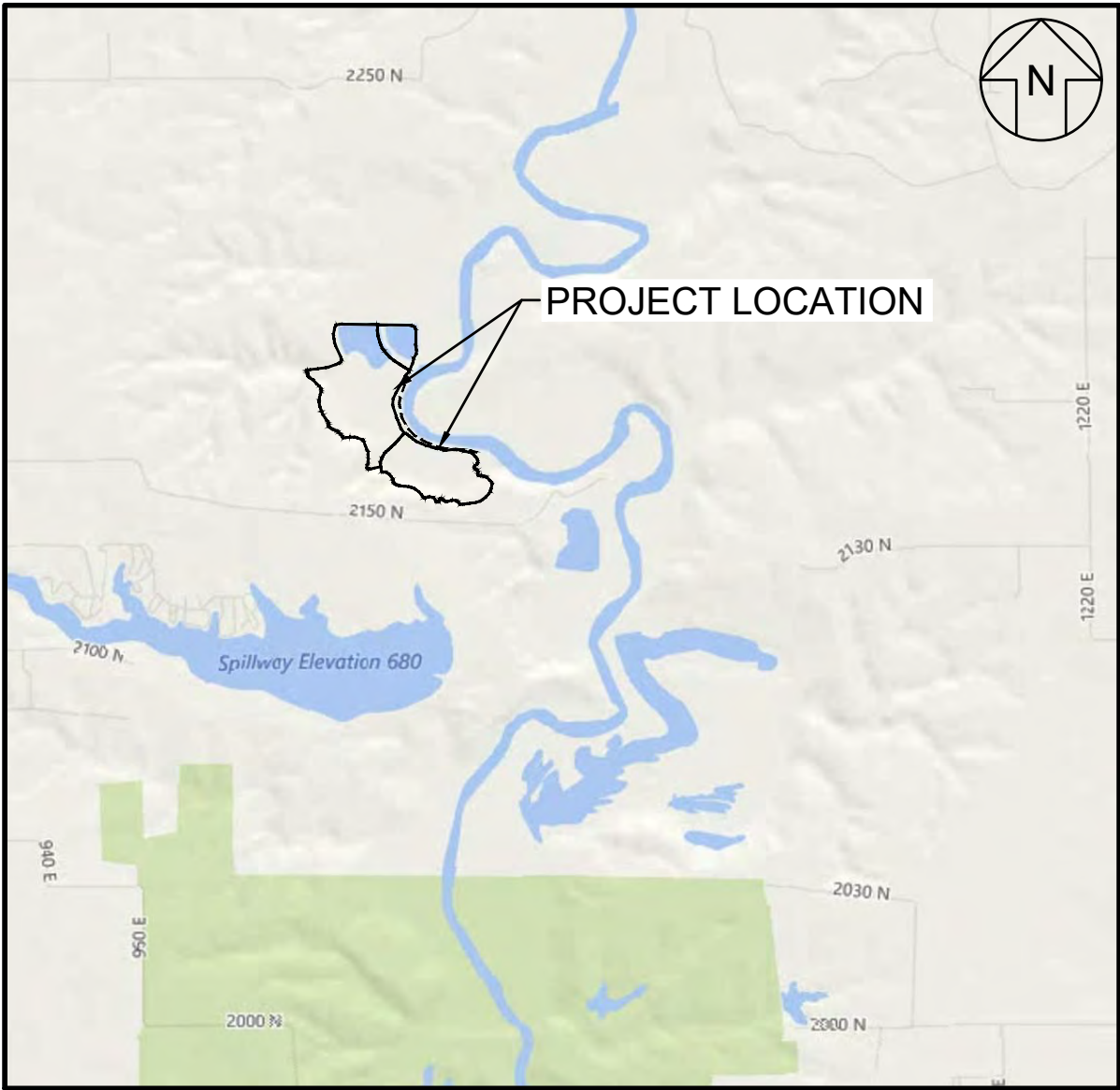
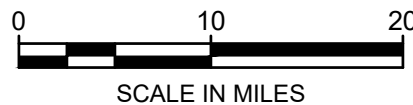
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DYNEGY MIDWEST GENERATION VERMILION POWER PLANT EROSION MITIGATION RIPRAP DESIGN VERMILION COUNTY, ILLINOIS PROJECT NO. CHE8404 JULY 2023



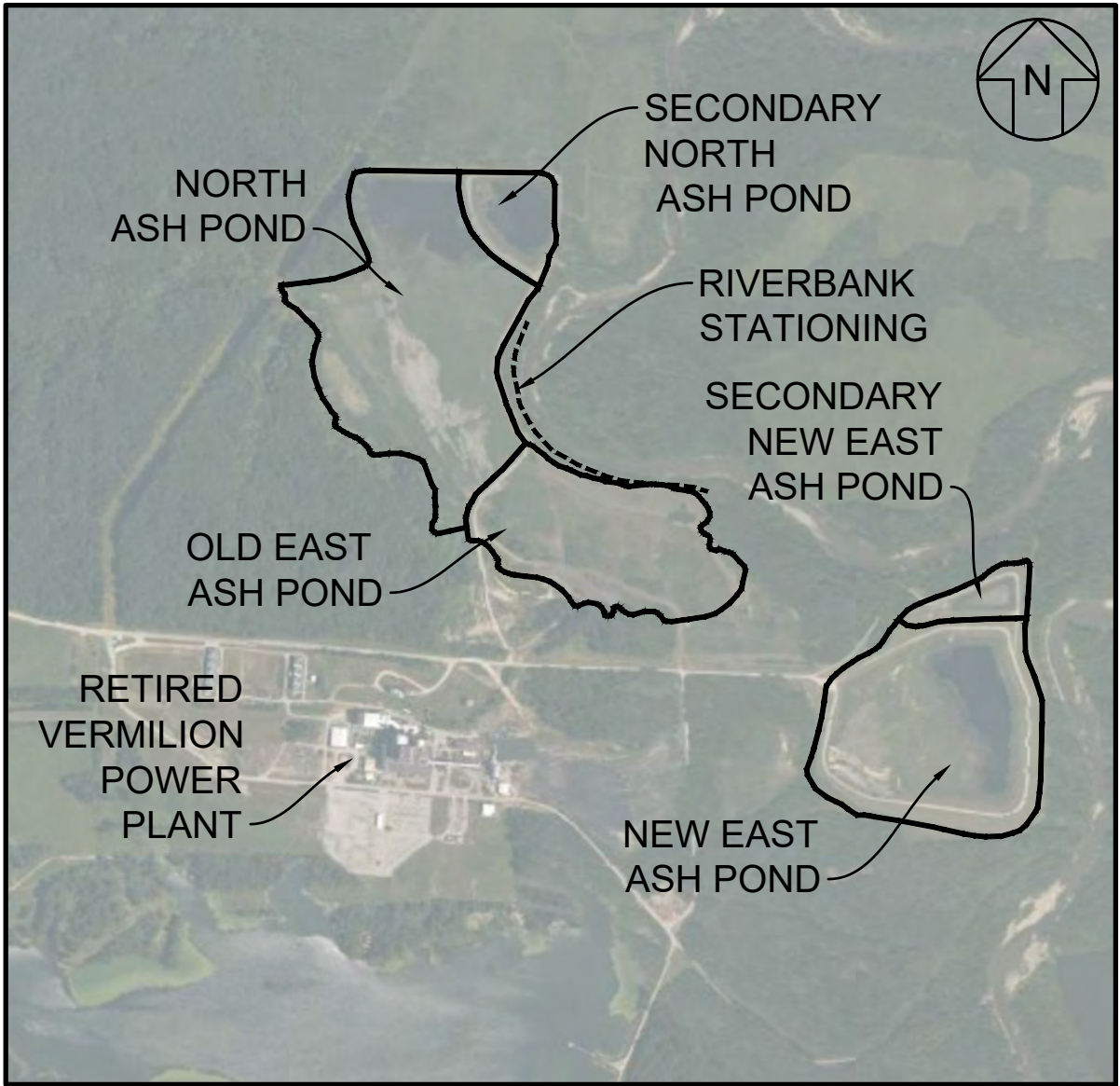
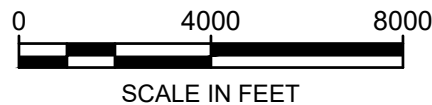
SOURCE: BING MAPS

VICINITY MAP



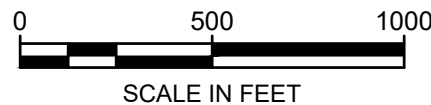
SOURCE: BING MAPS

LOCATION MAP



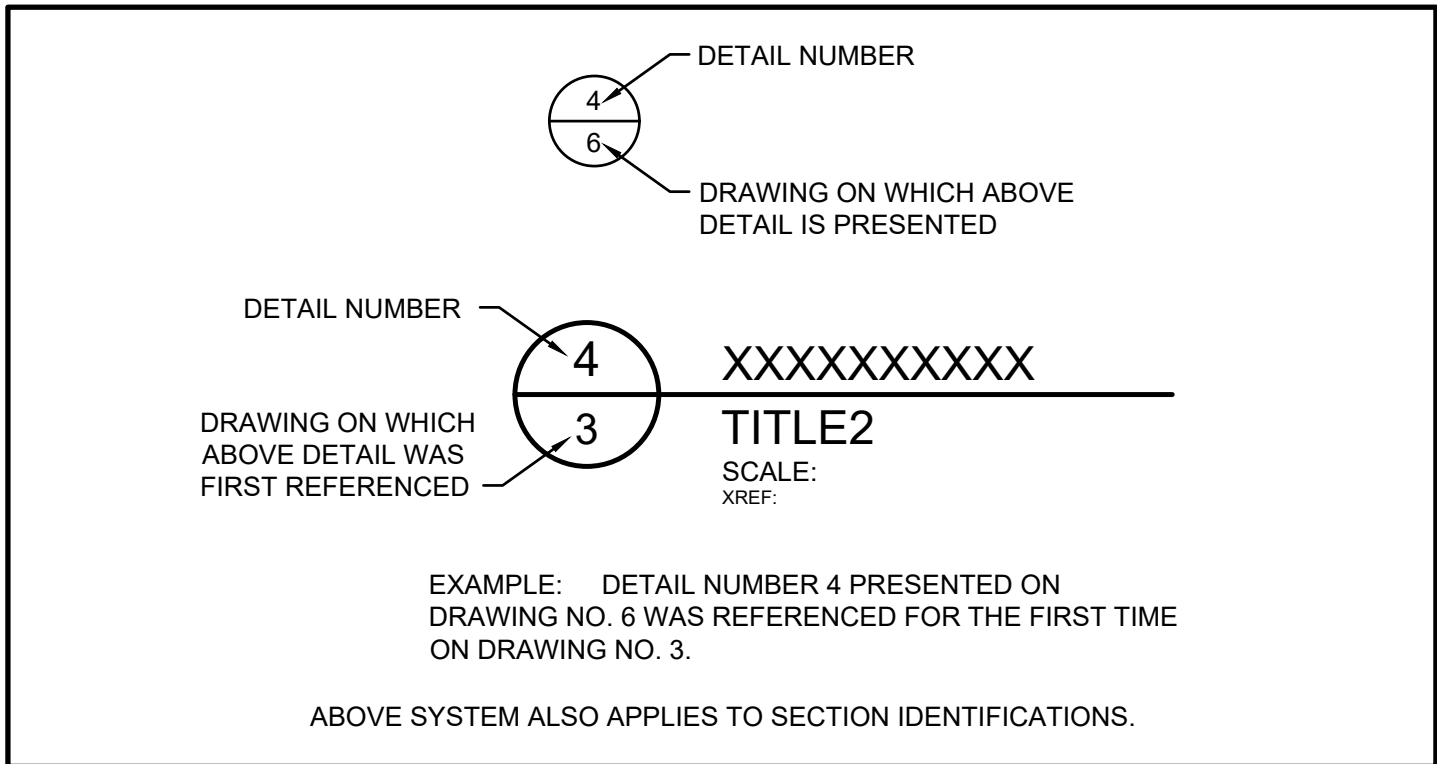
SOURCE: BING MAPS

SITE MAP



INDEX OF SHEETS

DRAWINGS LIST	
DRAWING	SHEET TITLE
1	COVER SHEET
2	OVERALL PROJECT SITE PLAN
3	PRE-CONSTRUCTION CONDITIONS
4	PROPOSED CONDITIONS
5	CROSS SECTIONS
6	DETAILS
7	STORMWATER POLLUTION PREVENTION PLAN

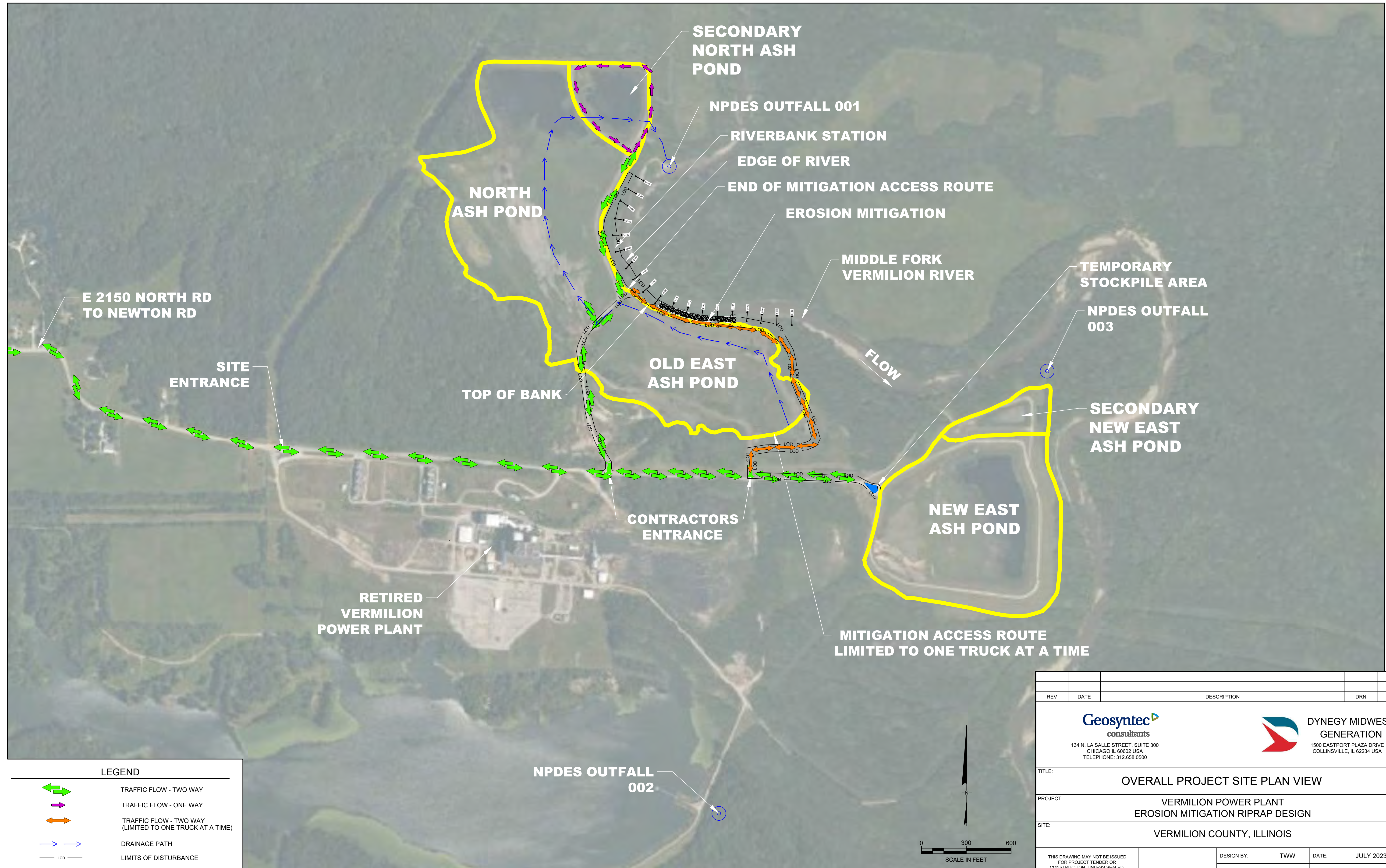


DETAIL IDENTIFICATION LEGEND

PERMIT APPLICATION
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REV	DATE	DESCRIPTION	DRN	APP
<div><div><div>Geosyntec</div><div>consultants</div><div>134 N. LA SALLE STREET, SUITE 300 CHICAGO IL 60602 USA TELEPHONE: 312.658.0500</div></div><div><div></div><div>DYNEGY MIDWEST GENERATION</div><div>1500 EASTPORT PLAZA DRIVE COLLINSVILLE, IL 62234 USA</div></div></div>				
TITLE: COVER SHEET				
PROJECT: VERMILION POWER PLANT EROSION MITIGATION RIPRAP DESIGN				
SITE: VERMILION COUNTY, ILLINOIS				
THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.		DESIGN BY: TWW	DATE: JULY 2023	G
SIGNATURE		DRAWN BY: DW	PROJECT NO.: CHE8404	
DATE		CHECKED BY: IJV	FILE: CHE8404-001.DWG	
		REVIEWED BY: JPS	DRAWING NO.: 1 OF 7	
		APPROVED BY: TWW		

P:\V\CH8404 VPS CLOSURE\DRAWINGS\EROSION MITIGATION RIPRAP DESIGN\2-CH8404-002 OVERALL PROJECT SITE PLAN VIEW.DWG Last Edited by: D\Watkins on 6/26/23



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REV	DATE	DESCRIPTION	DRN	APP
<div><div><div>Geosyntec</div><div>consultants</div><div>134 N. LA SALLE STREET, SUITE 300 CHICAGO IL 60602 USA TELEPHONE: 312.658.0500</div></div><div><div></div><div>DYNEGY MIDWEST GENERATION</div><div>1500 EASTPORT PLAZA DRIVE COLLINSVILLE, IL 62234 USA</div></div></div>				
TITLE: OVERALL PROJECT SITE PLAN VIEW				
PROJECT: VERMILION POWER PLANT EROSION MITIGATION RIPRAP DESIGN				
SITE: VERMILION COUNTY, ILLINOIS				
THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.		DESIGN BY: TWW	DATE: JULY 2023	G
SIGNATURE		DRAWN BY: DW	PROJECT NO.: CHE8404	
DATE		CHECKED BY: IJV	FILE: CHE8404-002.DWG	
		REVIEWED BY: JPS	DRAWING NO.: 2 OF 7	
		APPROVED BY: TWW		

P:\V\CH8404 VPS CLOSURE DRAWINGS\EROSION MITIGATION RIPRAP DESIGN\3-CH8404-003 SPRECONSTRUCTION CONDITION DWG Last Edited by: DWatkins on 6/20/23



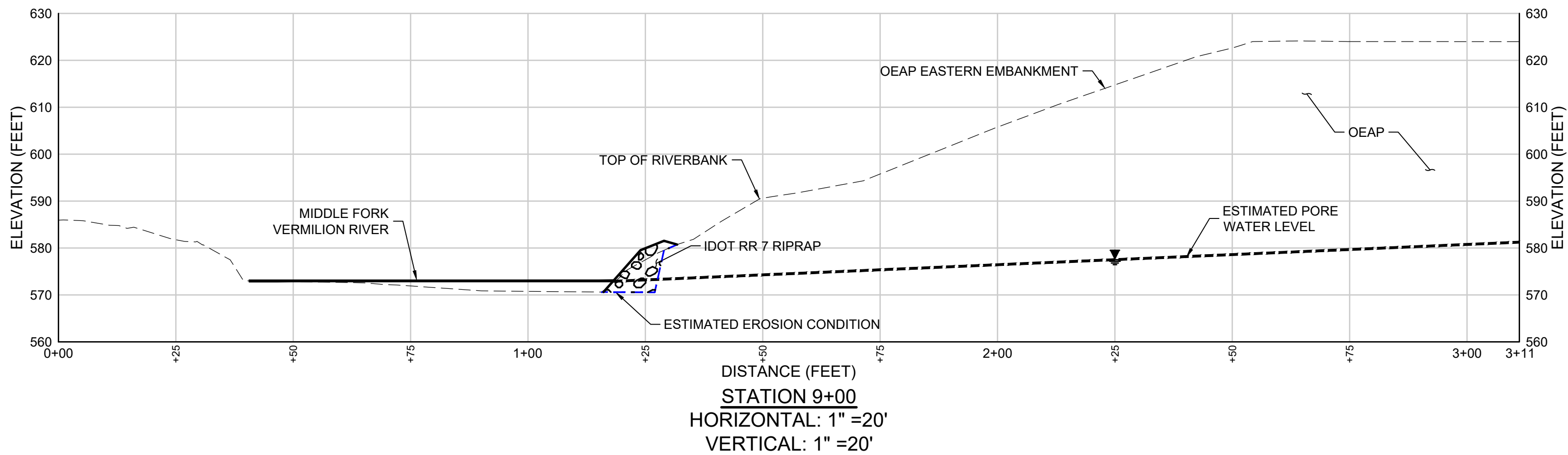
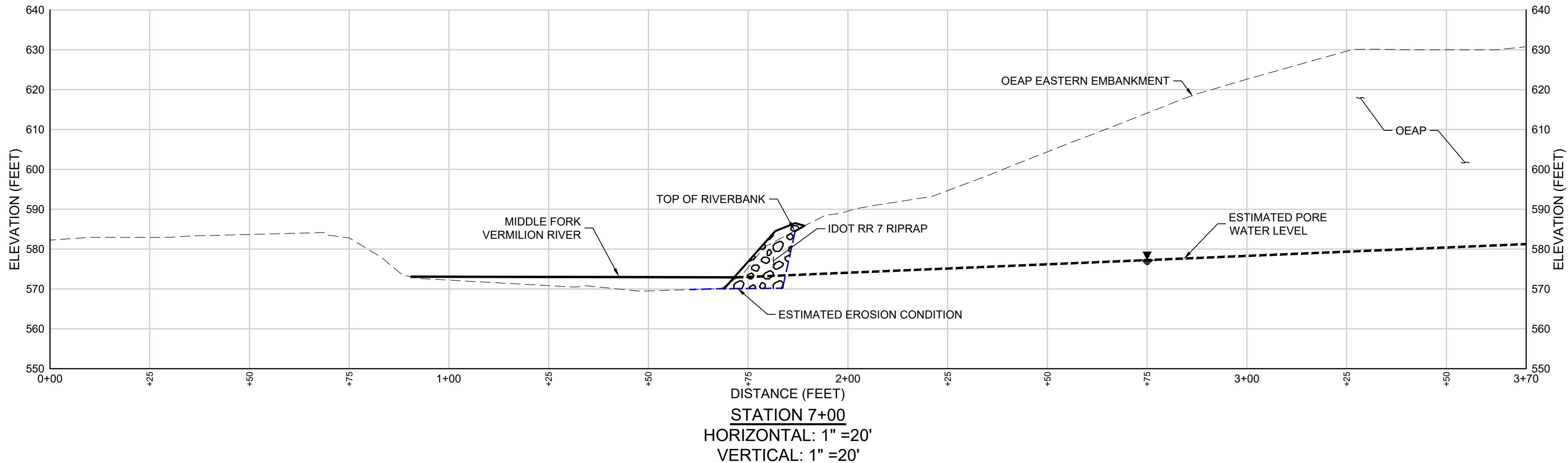
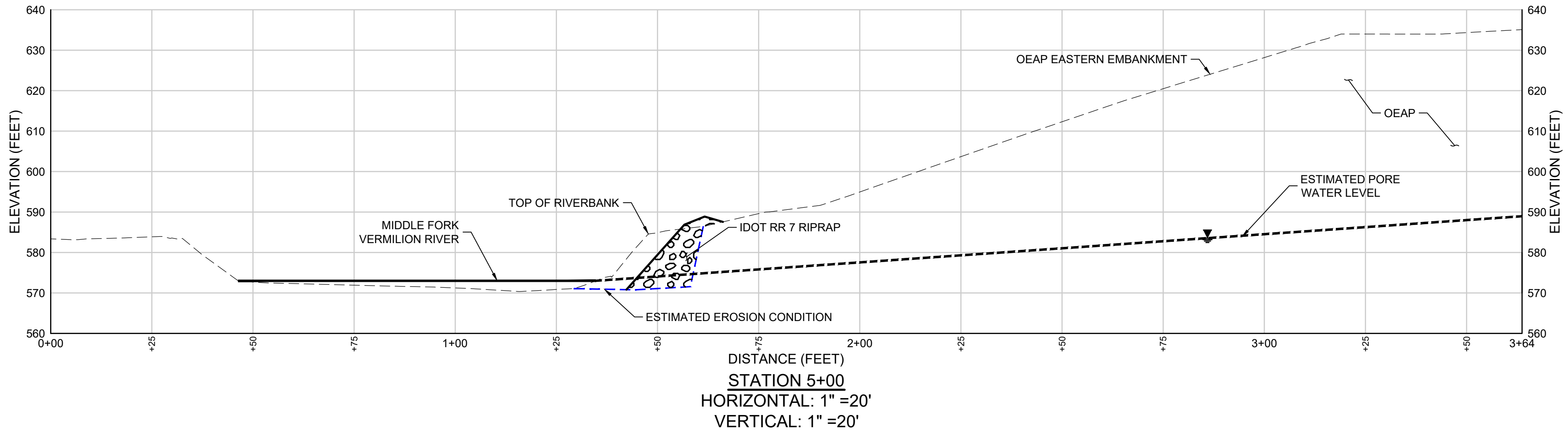
LEGEND	
	EXISTING OVERHEAD ELECTRIC
	EXISTING TREE LINE
	EXISTING POWER POLE
	EXISTING GUY WIRE
	EXISTING MANHOLE
	EXISTING MONITORING WELL
	DO NOT DISTURB
	TO BE REMOVED AND REPLACED
	APPROXIMATE LIMITS OF CCR
	EXISTING TOPO (MAJOR CONTOUR)
	EXISTING TOPO (MINOR CONTOUR)
	APPROXIMATE EXTENT OF EXISTING GABION BASKETS
	BORING LOCATION

- NOTES:
- TOPOGRAPHY SHOWN IS A COMBINATION OF A DETAILED TOPOGRAPHIC SURVEY COMPLETED ON MARCH 26, 2018 BY INGENAE, INC. (INGENAE) AND PUBLICLY AVAILABLE LIDAR. USED TO SUPPLEMENT EXISTING TOPOGRAPHY BEYOND THE LIMITS OF THE DETAILED SURVEY.
 - LIMITS OF ASH ARE APPROXIMATE AND ARE BASED ON LIMIT OF ASH INFORMATION PROVIDED BY OTHERS. ACTUAL LIMITS OF ASH MAY VARY AND WILL BE CONFIRMED DURING CONSTRUCTION.
 - AERIAL IMAGERY WAS OBTAINED BY GEOSYNTEC FROM GOOGLE EARTH PRO IN 2022 AND IS BEST-FIT TO THE PRECONSTRUCTION GROUND CONTOURS AND SURVEYED LOCATION OF SITE FEATURES. ACTUAL LOCATIONS SHOWN IN IMAGERY MAY VARY SLIGHTLY.
 - RIVERBANK STATIONING WAS PROVIDED BY INGENAE TO MATCH THE MONTHLY EROSION MONITORING STATIONS.
 - COORDINATE SYSTEM IS NORTH AMERICAN DATUM OF 1983 (NAD83) ILLINOIS STATE PLANE EAST.
 - VERTICAL DATUM IS NORTH AMERICAN DATUM OD 1988 (NAVD88).
 - BORING LOCATIONS ARE BASED ON SURVEY PROVIDED BY INGENAE OR DIGITIZED FROM BORINGS LOCATION MAPS BY OTHERS.

REV	DATE	DESCRIPTION	DRN	APP
<div><div><div>Geosyntec</div><div>consultants</div><div>134 N. LA SALLE STREET, SUITE 300 CHICAGO IL 60602 USA TELEPHONE: 312.658.0500</div></div><div><div>DYNEGY MIDWEST</div><div>GENERATION</div><div>1500 EASTPORT PLAZA DRIVE COLLINSVILLE, IL 62234 USA</div></div></div>				
TITLE: PRECONSTRUCTION CONDITION				
PROJECT: VERMILION POWER PLANT EROSION MITIGATION RIPRAP DESIGN				
SITE: VERMILION COUNTY, ILLINOIS				
THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.		DESIGN BY: TWWW	DATE: JULY 2023	G
SIGNATURE		DRAWN BY: DW	PROJECT NO.: CHE8404	
DATE		CHECKED BY: IJV	FILE: CHE8404-003.DWG	
		REVIEWED BY: JPS	DRAWING NO.: 3 OF 7	
		APPROVED BY: TWWW		

PERMIT APPLICATION
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P:\V\CHE8404 VPS CLOSURE\DRAWINGS\EROSION MITIGATION RIPRAP DESIGN\G5-CHE8404-005 SECTIONS.DWG Last Edited by: D\Watkins on 6/20/23



NOTES:

- EXISTING RIVERBANK GRADE MAY NOT BE REPRESENTATIVE AT THE TIME OF CONSTRUCTION. CONTRACTOR SHALL SURVEY THE RIVERBANK PRIOR TO THE START OF CONSTRUCTION.
- EROSION MITIGATION RIPRAP SHALL CONSIST OF IDOT RR 7 RIPRAP. STONE FOR RIPRAP SHALL CONSIST OF FIELD STONE OR ROUGH UNHEWN QUARRY STONE. THE STONE SHALL BE HARD AND ANGULAR AND OF A QUALITY THAT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING.
- EQUIPMENT SHALL NOT BE STAGED ON THE RIVERBANK SLOPE.
- GEOTEXTILE SEPARATOR FABRIC SHALL BE ANCHORED IN PLACE AS DIRECTED BY THE MANUFACTURER AND INCLUDE AN OVERLAP OF 12 INCHES AT SEAMS.
- RIPRAP SHALL BE CAREFULLY PLACED AS TO AVOID DAMAGE TO THE UNDERLYING GEOTEXTILE AND TO PRODUCE A WELL GRADED MASS OF RIPRAP WITH A MINIMAL PERCENTAGE OF VOIDS
- BENCHING WILL BE COMPLETED WHEN COMPACTING ANY SOIL ON THE EASTERN EMBANKMENT.
- CONTRACTOR SHALL PLACE EROSION CONTROL BLANKETS ON ANY SLOPE STEEPER THAN 3H:1V AND SEED/STRAW THE DISTURBED AREA.
- GEOTEXTILE SEPARATOR FABRIC SPECIFICATION:

REQUIRED PROPERTY VALUES FOR GEOTEXTILE SEPERATOR FABRIC				
PROPERTIES	QUALIFIER	UNITS	SPECIFIED VALUES ⁽¹⁾	TEST METHOD
PRODUCT REQUIREMENTS				
TYPE	-	-	NONWOVEN NEEDLE - PUNCHED	-
POLYMER COMPOSTION	MINIMUM	PERCENT (%)	95 POLYPROPYLENE OR POLYESTER	-
MASS PER UNIT AREA	-	OUNCES PER SQUARE YARD (oz/yd ²)	16	ASTM D5261
MECHANICAL REQUIREMENTS	-			
GRAB STRENGTH	-	POUND (lb)	270	ASTM D4632 ⁽²⁾
TEAR STRENGTH	-	POUND (lb)	105	ASTM D4533 ⁽³⁾
PUNCTURE STRENGTH	-	POUND (lb)	725	ASTM D6241
AOS, US SIEVE	-	-	100	ASTM D4751
ULTRAVIOLET RESISTANCE	MINIMUM	PERCENT (%)	70	ASTM D4355

A. ALL VALUES REPRESENT MINIMUM AVERAGE ROLL VALUES.

B. MINIMUM OF VALUES MEASURED IN MACHINE AND CROSS MACHINE DIRECTIONS WITH 1-INCH CLAMP ON CONSTANT RATE OF EXTENSION (CRE) MACHINE.

C. FURNISH GEOTEXTILES THAT ARE STROCK PRODUCTS.

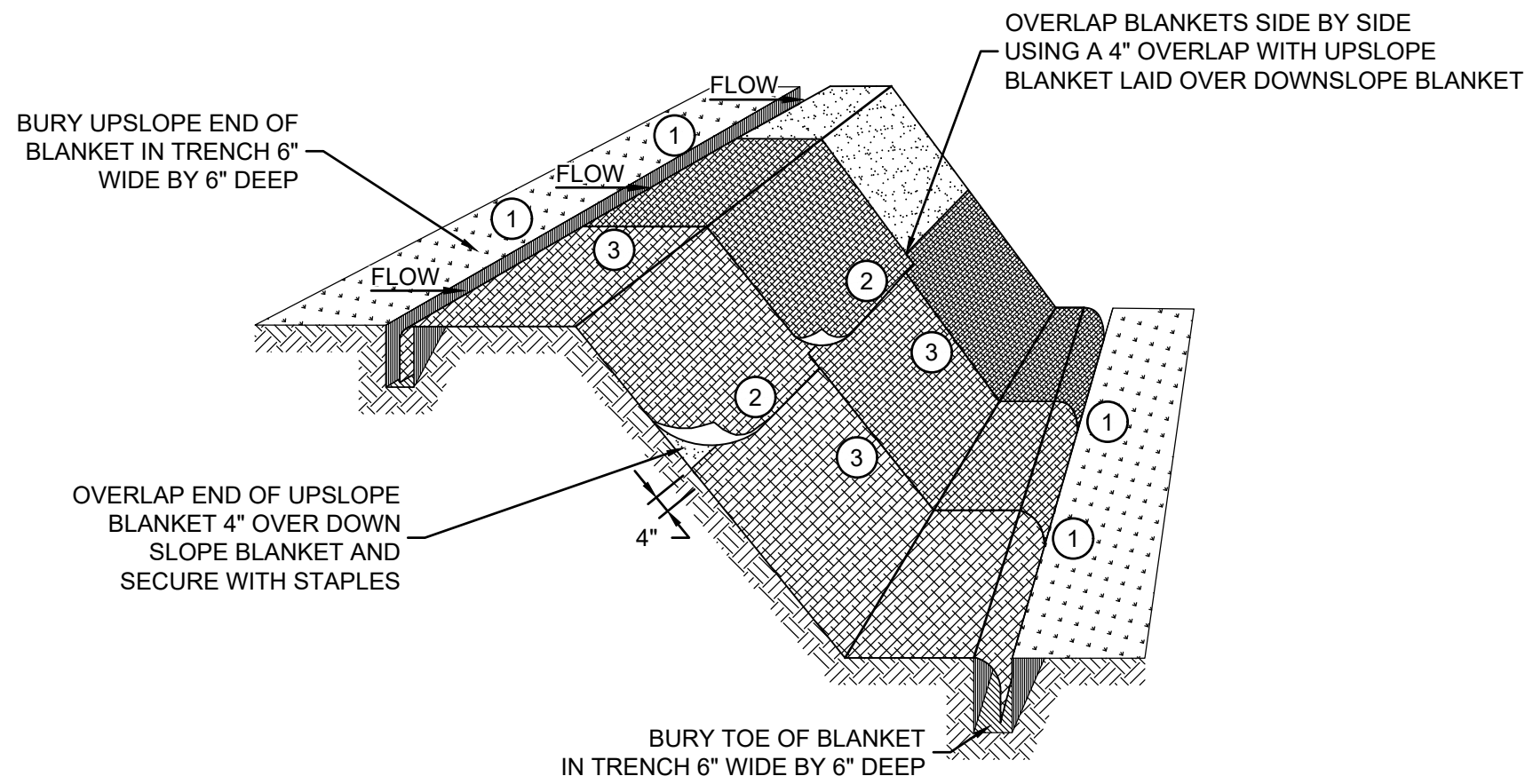
D. FURNISH GEOTEXTILES THAT ARE MANUFACTURED FROM FIRST QUALITY POLYMERS, WITH NO MORE THAN 10 PERCENT RECLAIMED POLYMER USED IN PRODUCTION.

E. FURNISH POLYMERIC THREADS FOR STITCHING THAT ARE ULTRA-VIOLET (UV) LIGHT STABILIZED TO AT LEAST THE SAME REQUIREMENTS AS THE GEOTEXTILE TO BE SEWN. FURNISH POLYESTER OR POLYPROPYLENE THREADS THAT HAVE A MINIMUM SIZE OF 2,000 DENIER.

REV	DATE	DESCRIPTION	DRN	APP
<div><div><div>Geosyntec</div><div>consultants</div><div>134 N. LA SALLE STREET, SUITE 300 CHICAGO IL 60602 USA TELEPHONE: 312.658.0500</div></div><div><div>DYNEGY MIDWEST GENERATION</div><div>1500 EASTPORT PLAZA DRIVE COLLINSVILLE, IL 62234 USA</div></div></div>				
TITLE: CROSS SECTIONS				
PROJECT: VERMILION POWER PLANT EROSION MITIGATION RIPRAP DESIGN				
SITE: VERMILION COUNTY, ILLINOIS				
THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.		DESIGN BY: TWW	DATE: JULY 2023	G
SIGNATURE		DRAWN BY: DW	PROJECT NO.: CHE8404	
DATE		CHECKED BY: IJV	FILE: CHE8404-005.DWG	
		REVIEWED BY: JPS	DRAWING NO.: 5 OF 7	
		APPROVED BY: TWW		

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P:\V\CH8404 VPS CLOSURE\DRAWINGS\EROSION MITIGATION RIPRAP DESIGN\G-CHE8404-006 DETAILS.DWG Last Edited by: DWatkins on 6/20/23



INSTALLATION ON SLOPES GREATER THAN FOUR PERCENT
AND STORMWATER CHANNELS

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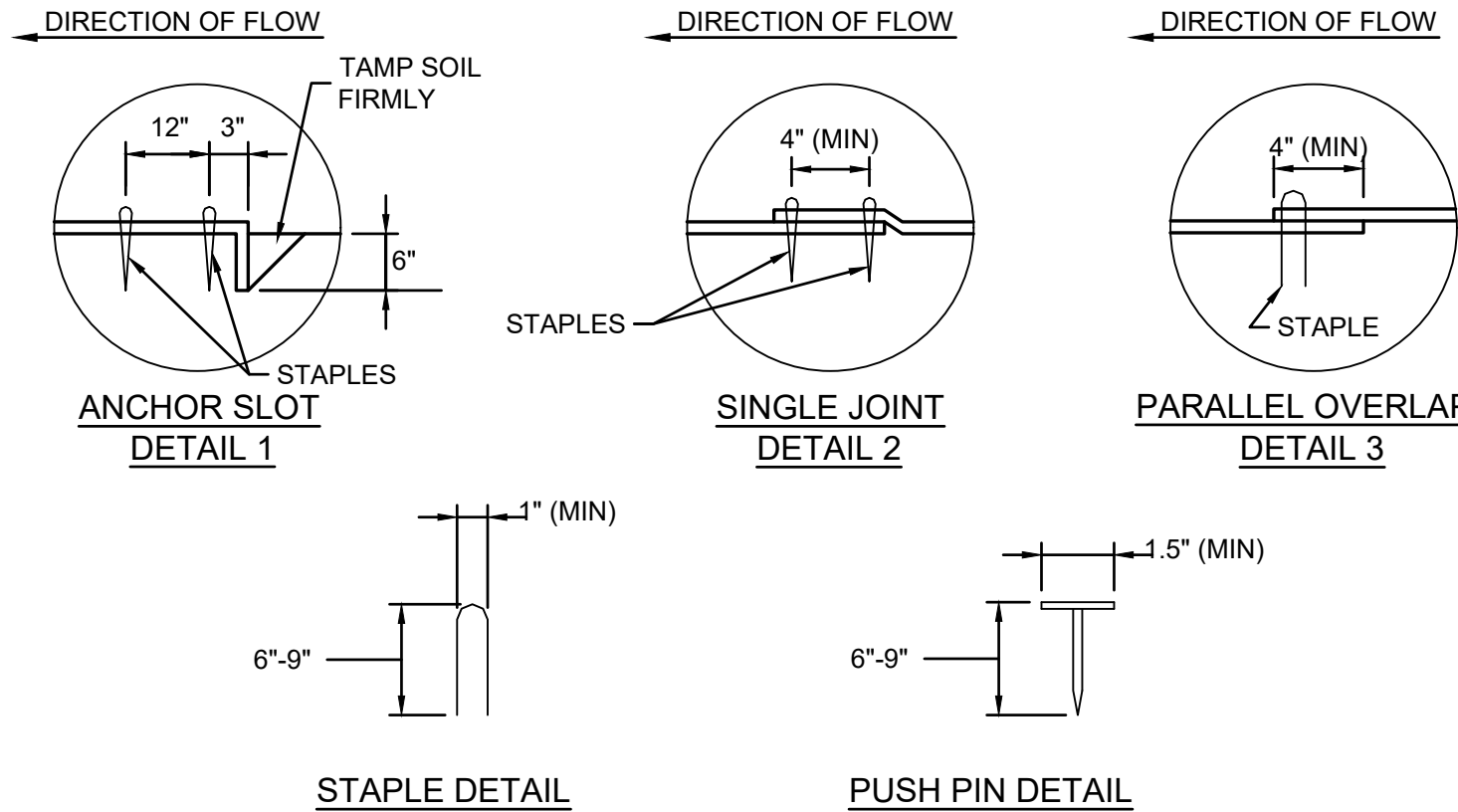
DETAIL

EROSION CONTROL BLANKET INSTALLATION

SCALE: N.T.S.

NOTES:

- EROSION CONTROL BLANKETS SHALL BE INSTALLED ON SLOPES 3H:1V OR STEEPER AND AFTER THE SEED BED PREPARATION, FERTILIZING, OR LIMING AND SEEDING IS COMPLETED. THE BLANKET SHALL BE IN FIRM CONTACT WITH THE SOIL AND ALL ROCKS OR SOIL CLOUDS 1.5 INCHES OR LARGER MUST BE REMOVED PRIOR TO INSTALLATION. BLANKETS SHALL BE ANCHORED PER THE MANUFACTURER'S RECOMMENDATION WITH THE PROPER NUMBER AND SPACING OF STAPLES. THE STAPLES/PINS SHALL BE THE PROPER WIDTH AND LENGTH TO MEET THE MANUFACTURER'S RECOMMENDATIONS.
- THE BLANKET SHALL BE UNROLLED UPSTREAM TO DOWNSTREAM PARALLEL TO THE DIRECTION OF FLOW. THE UPSTREAM END OF EACH BLANKET SHALL BE ANCHORED IN A MINIMUM 6-INCH DEEP ANCHOR TRENCH, BACKFILLED, AND COMPACTED. THESE BLANKETS, WHEN LAID SIDE-BY-SIDE, SHALL OVERLAP A MINIMUM OF 4 INCHES.

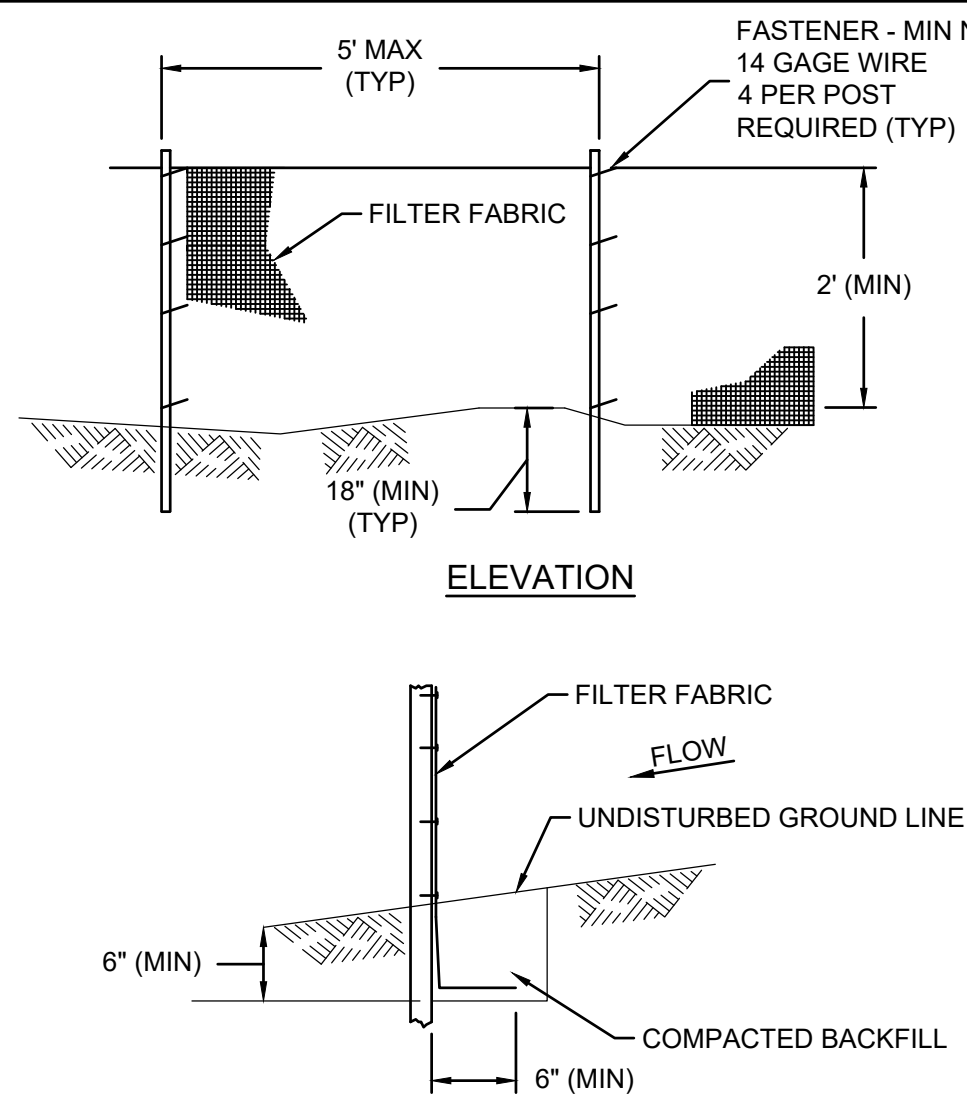


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DETAIL

EROSION CONTROL BLANKET ANCHORS AND JOINTS

SCALE: N.T.S.

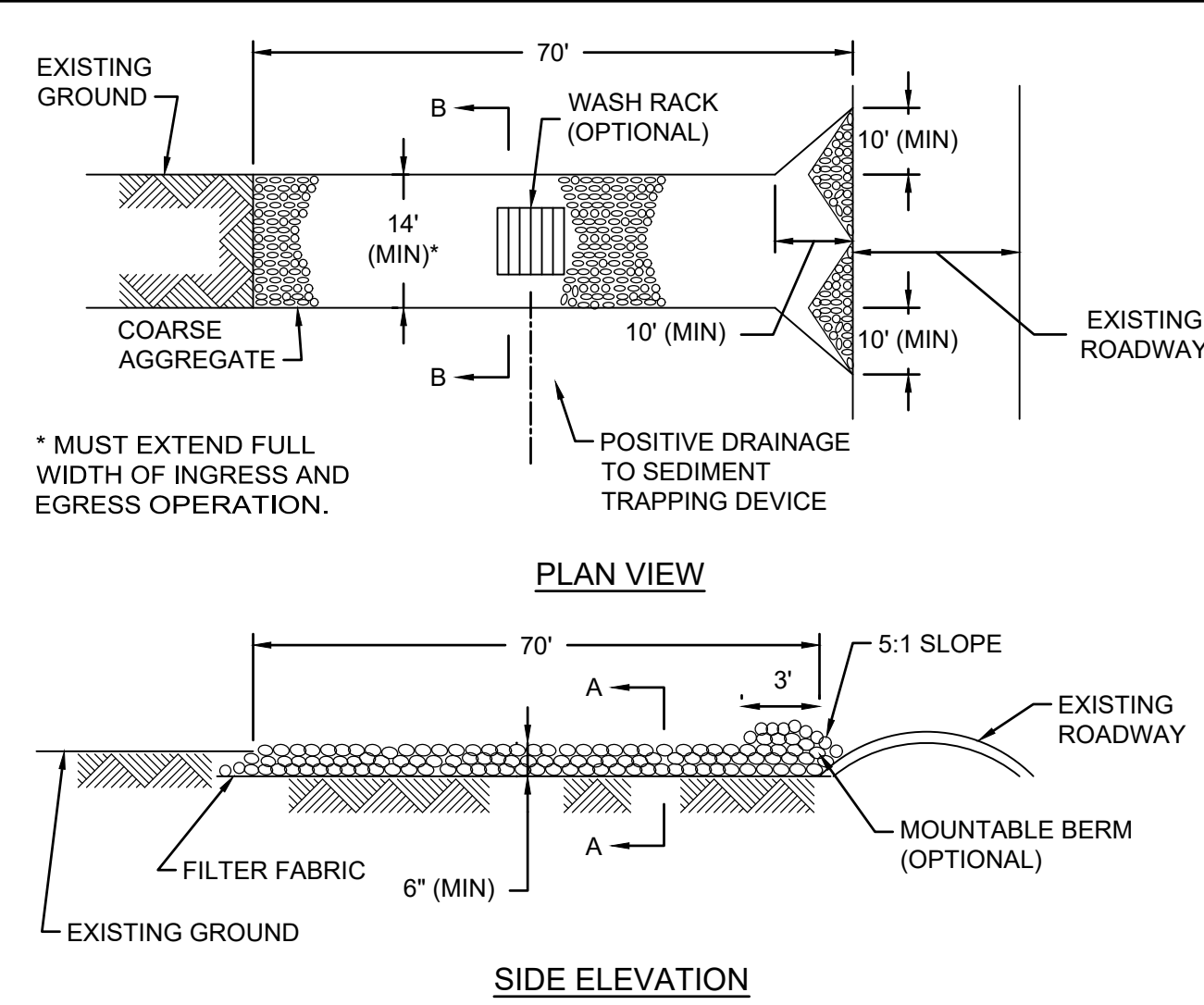


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DETAIL

SILT FENCE

SCALE: N.T.S.

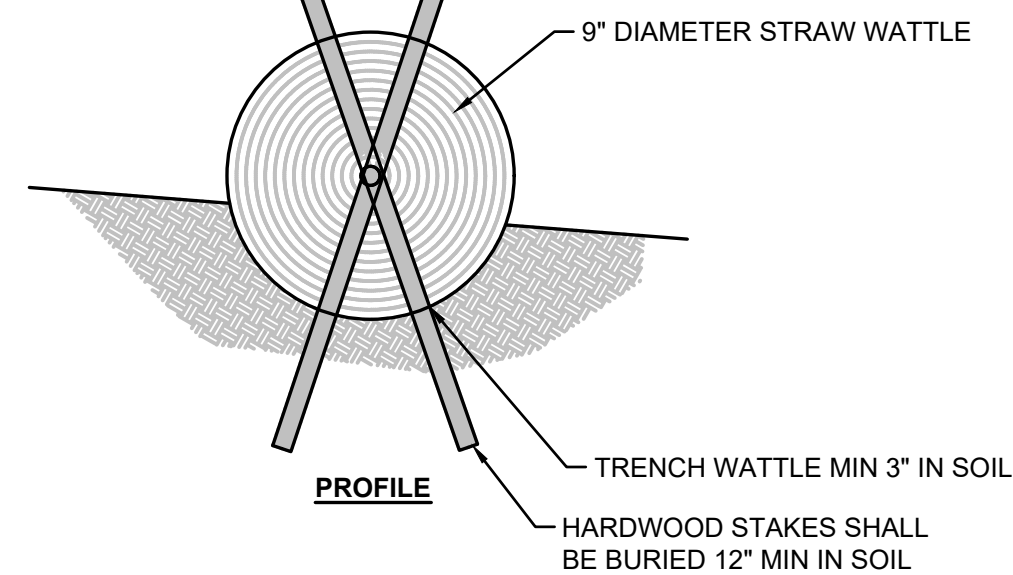


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DETAIL

CONSTRUCTION ENTRANCE

SCALE: N.T.S.



NOTES:

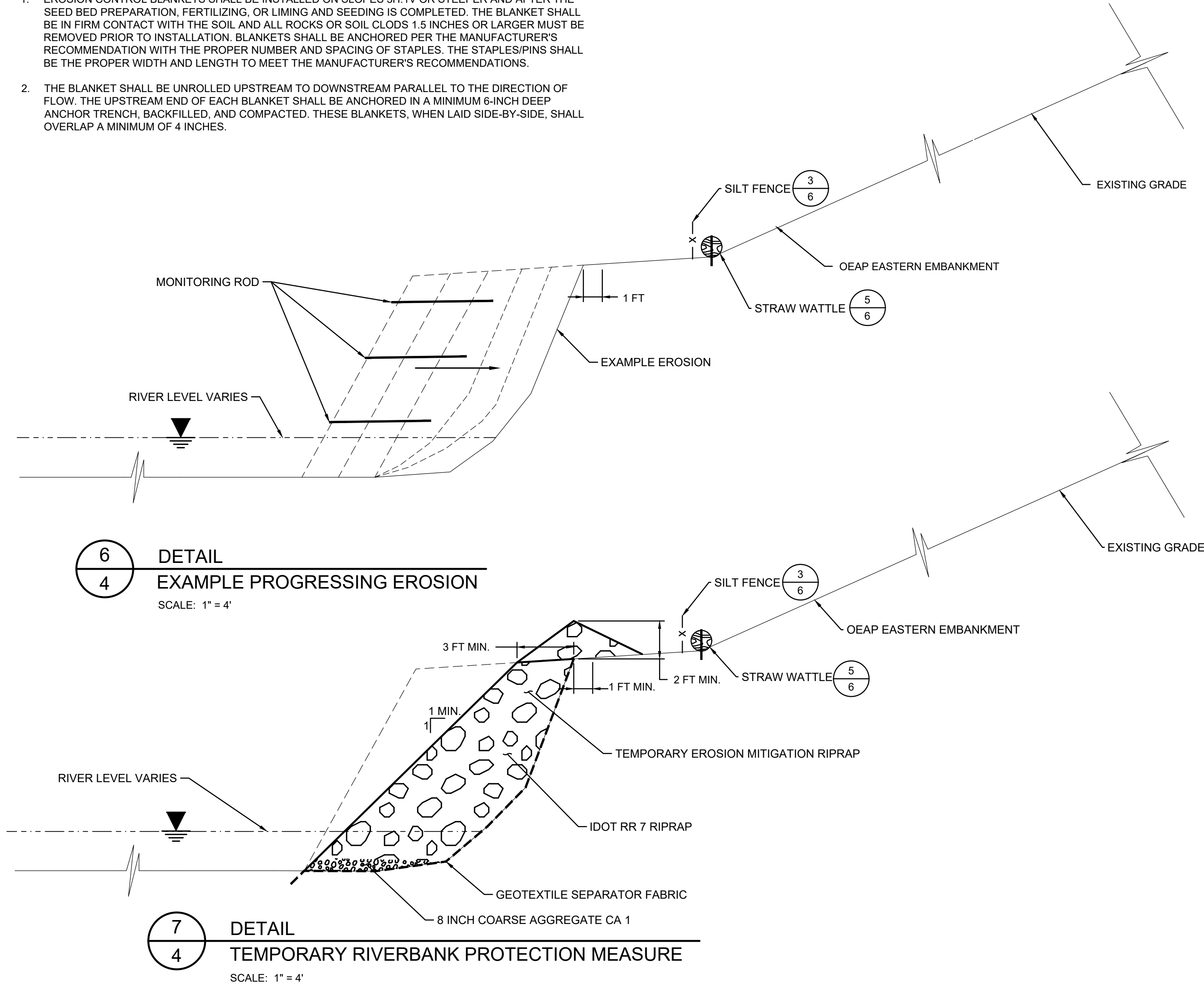
- REMOVE ACCUMULATED SEDIMENT WHEN SEDIMENT REACHES ONE-HALF THE HEIGHT OF THE WATTLE.
- IF ROCKY SOILS PREVENT PROPER INSTALLATION OF WOOD STAKES, CONTRACTOR SHALL PLACE GRAVEL BAGS OVER THE STRAW WATTLE, PERPENDICULAR TO THE STRAW WATTLE, RATHER THAN USING THE WOOD STAKES IN THOSE LOCATIONS. GRAVEL BAGS SHALL BE SPACED MAX 2' ON CENTER.

5
7

DETAIL

STRAW WATTLE

SCALE: N.T.S.



6
4

DETAIL

EXAMPLE PROGRESSING EROSION

SCALE: 1" = 4'

7
4

DETAIL

TEMPORARY RIVERBANK PROTECTION MEASURE

SCALE: 1" = 4'

PERMIT APPLICATION
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REV		DATE		DESCRIPTION		DRN APP	
<div><div><div><div><div><div></div><div>Geosyntec</div></div><div><div>consultants</div><div>134 N. LA SALLE STREET, SUITE 300 CHICAGO IL 60602 USA TELEPHONE: 312.658.0500</div></div></div><div><div><div></div><div>DYNEGY MIDWEST GENERATION</div></div><div><div>1500 EASTPORT PLAZA DRIVE COLLINSVILLE, IL 62234 USA</div></div></div></div></div></div>							
TITLE: <div>RIVERBANK TEMPORARY PROTECTION DESIGN</div>							
PROJECT: <div>VERMILION POWER PLANT EROSION MITIGATION RIPRAP DESIGN</div>							
SITE: <div>VERMILION COUNTY, ILLINOIS</div>							
<div>THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.</div> <div><div>SIGNATURE</div><div>DATE</div></div>		DESIGN BY: TWW		DATE: JULY 2023			
		DRAWN BY: DW		PROJECT NO.: CHE8404			
		CHECKED BY: IJV		FILE: CHE8404-006.DWG			
		REVIEWED BY: JPS		DRAWING NO.:			
		APPROVED BY: TWW		6 OF 7			

P:\VCH0404 VPS CLOSURE DRAWINGS\EROSION MITIGATION RIPRAP DESIGN\7-CH0404-007 EROSION POLLUTION PREVENTION PLAN.DWG Last Edited by: DWatkins on 6/27/23



IMAGE SOURCE: BING MAPS

PROJECT NAME AND LOCATION
VERMILION POWER PLANT
VERMILION FLY ASH PONDS CLOSURE
VERMILION COUNTY, ILLINOIS

OWNER NAME AND ADDRESS
DYNEGY MIDWEST GENERATION, LLC
1500 EASTPORT PLAZA DRIVE
COLLINSVILLE, IL 62234

RECEIVING WATERWAY
THE NEAREST RECEIVING WATERWAY IS VERMILION RIVER.

DESCRIPTION OF ACTIVITIES

1. THIS SWPPP HAS BEEN PREPARED FOR THE CONSTRUCTION OF THE EROSION MITIGATION RIPRAP. THIS WILL CONSIST OF PLACING EROSION AND SEDIMENT CONTROLS, TREE REMOVAL, STOCKPILING RIPRAP, PLACING GEOTEXTILE FABRIC, PLACING RIPRAP IN THE RIVER, AND RESTORATION OF DISTURBED AREAS.

SWPPP NOTES:

1. A NOTICE OF INTENT SHALL BE SUBMITTED TO THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY (ILLINOIS EPA) BY THE OWNER AND ALL CONSTRUCTION ACTIVITIES SHALL COMPLY WITH THE ILLINOIS GENERAL PERMIT AND THE ILLINOIS URBAN MANUAL CONSTRUCTION SPECIFICATIONS.

2. A COPY OF THE STORMWATER POLLUTION PREVENTION PLAN SHALL BE KEPT ON-SITE.

3. A COPY OF THE LETTER OF NOTIFICATION OF COVERAGE ALONG WITH THE GENERAL NPDES PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION SITE ACTIVITIES SHALL BE POSTED IN A PROMINENT PLACE FOR PUBLIC VIEWING AT THE FRONT GATE.

4. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE IMPLEMENTED PRIOR TO THE START OF CONSTRUCTION AND MAINTAINED THROUGHOUT CONSTRUCTION.

5. ACTIVITIES ARE TO BE PHASED TO THE EXTENT PRACTICAL TO MINIMIZE THE AMOUNT OF AREA DISTURBED AT ANY GIVEN TIME. THE CONTRACTOR SHALL KEEP A RECORD OF DATES WHEN MAJOR GRADING ACTIVITIES OCCUR, WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE, AND WHEN EROSION STABILIZATION MEASURES ARE INITIATED.

6. THE CONTRACTOR SHALL CONDUCT REGULARLY SCHEDULED INSPECTIONS, IN ACCORDANCE WITH THE GENERAL PERMIT, ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN THE START OF CONSTRUCTION AND MAINTAINED THROUGHOUT CONSTRUCTION, AND 24 HOURS AFTER ANY STORM EVENT GREATER THAN 1/4" OF RAIN PER 24-HOUR PERIOD. THE CONTRACTOR SHALL KEEP ALL INSPECTIONS REPORTS AVAILABLE FOR INSPECTORS IMMEDIATELY UPON REQUEST. AFTER AN INSPECTION, NEW OR MODIFIED CONTROLS MUST BE INSTALLED OR REPAIRED WITHIN SEVEN (7) DAYS OF THE DISCOVERY. THE INSPECTION REPORT IS TO INCLUDE THE:

a. INSPECTOR'S NAME, TITLE, AND QUALIFICATIONS (REQUIRED QUALIFICATIONS SPECIFIED IN THE GENERAL PERMIT);
b. DATE OF INSPECTION;
c. TOTAL RAINFALL SINCE THE PREVIOUS INSPECTION, IF APPLICABLE;
d. OBSERVATIONS RELATIVE TO THE EFFECTIVENESS OF THE BMPS;
e. ACTIONS TAKEN AS NECESSARY TO CORRECT THE OBSERVED PROBLEM; AND
f. LISTING OF AREAS WHERE GROUND DISTURBANCES HAVE PERMANENTLY OR TEMPORARILY STOPPED.

7. ALL MATERIAL MANAGEMENT, STORAGE, AND DISPOSAL WILL BE CONDUCTED IN THE MOST PRACTICABLE MANNER TO PREVENT POLLUTION. A SPILL KIT SHOULD BE AVAILABLE ON-SITE WITH APPROPRIATE MEASURES TO CONTROL SPILLS (I.E., OIL ABSORBENT MATERIALS, BROOMS, ETC.).

8. ALL HAZARDOUS WASTE AND SPILL PREVENTION PROCEDURES AT ALL TIMES SHOULD ADHERE TO APPLICABLE FEDERAL AND STATE REGULATIONS. HAZARDOUS WASTES THAT ARE TRANSPORTED, STORED, OR USED FOR MAINTENANCE, CLEANING, OR REPAIRS SHALL BE MANAGED ACCORDING TO THE PROVISIONS OF APPLICABLE HAZARDOUS WASTE LAWS AND REGULATIONS. THE CONTRACTOR SHALL CONTACT THE ENGINEER TO DISCUSS PROCEDURES FOR NOTIFICATION OF APPROPRIATE EMERGENCY RESPONSE AGENCIES, AND REGULATORY AGENCIES WHERE A LEAK, SPILL, OR OTHER RELEASE CONTAINING A HAZARDOUS SUBSTANCE OR OIL.

9. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED AND CLEANED AS NECESSARY TO KEEP THE MEASURES IN EFFECTIVE OPERATING CONDITION, INCLUDING REMOVAL OF EXCESS SEDIMENT AS NECESSARY.

10. STABILIZATION OF DISTURBED AREAS MUST BE INITIATED WITHIN ONE (1) DAY AND COMPLETED WITHIN FOURTEEN (14) DAYS WHENEVER GROUND DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE. AT THE COMPLETION OF GROUND DISTURBING ACTIVITIES THE ENTIRE SITE MUST HAVE PERMANENT VEGETATIVE COVER, MEETING VEGETATIVE DENSITY REQUIREMENTS IN ALL AREAS NOT COVERED BY HARDSCAPE.

11. WHEN INSPECTING EROSION CONTROL BLANKETS, CHECK FOR DAMAGE DUE TO WATER RUNNING UNDER THE BLANKET, TENTING OF THE BLANKET, OR IF THE BLANKETS HAVE BEEN DISPLACED BY WIND. ALSO, INSPECT LOCATIONS IN THE FLOW CHANNELS WHERE THE BLANKET TERMINATES AND TRANSITIONS IN ANOTHER BMP FOR EROSION UNDER THE BLANKET. IN ANY AREAS WHERE WATER SEEPED UNDER THE BLANKET, MORE STAPLES MAY BE NEEDED PER GIVEN AREA OR MORE FREQUENT ANCHORING TRENCHES INSTALLED WITH BETTER COMPACTION. IF SIGNIFICANT EROSION HAS OCCURRED UNDER THE BLANKET, GRADING AND RESEEDING MAY ALSO BE NECESSARY. ANY BLANKETS THAT HAVE BEEN DISPLACED WILL NEED TO BE REINSTALLED AND RE-STAPLED.

12. STOCKPILED MATERIALS SHALL BE CONSOLIDATED UP SLOPE FROM ADEQUATE SEDIMENTATION CONTROLS. SILT FENCE OR STRAW WATTLE DITCH CHECKS WILL BE USED IN ORDER TO DIVERT, RETAIN, OR DETAIN FLOWS OR OTHERWISE LIMIT EXPOSURE TO AND DISCHARGE FROM STOCKPILES.

13. RIPRAP SHALL BE INSPECTED AFTER RAIN EVENTS DURING CONSTRUCTION GREATER THAN 0.5 INCHES, TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE OR IF STONES HAVE BEEN DISLODGED. MAKE ALL NEEDED REPAIRS IMMEDIATELY TO PREVENT FURTHER EROSION OR SEDIMENT DISCHARGE.

14. THE ENTRANCES SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS OR STREETS AND MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL AGGREGATE OR OVER TURNING THE EXISTING AGGREGATE WHEN THE VOIDS BETWEEN THE STONES BECOME CLOGGED WITH SEDIMENT. ALL SEDIMENT SPILLED, DROPPED OR WASHED ONTO PUBLIC RIGHT-OF-WAYS MUST BE REMOVED IMMEDIATELY. PER THE ILLINOIS URBAN MANUAL, IF CONDITIONS ON THE SITE ARE SUCH THAT THE VEHICLES TRAVELING OVER THE GRAVEL DO NOT REMOVE THE MAJORITY OF THE MUD, THEN THE TIRES OF THE VEHICLES MUST BE WASHED BEFORE ENTERING A PUBLIC ROAD. WASH WATER MUST BE CARRIED AWAY FROM THE ENTRANCE TO A SEDIMENT TRAPPING FACILITY. A WASH RACK MAY BE USED TO MAKE WASHING MORE CONVENIENT AND EFFECTIVE.

SILT FENCE

1. PER THE ILLINOIS URBAN MANUAL, FENCE POSTS SHALL BE A MINIMUM OF 48 INCHES LONG. WOOD POSTS SHALL BE OF SOUND QUALITY WOOD WITH A NOMINAL CROSS SECTIONAL AREA OF 1.5 X 1.5 INCHES. STEEL POSTS SHALL BE STANDARD T AND U SECTIONS WEIGHING NOT LESS THAN 1.33 POUNDS PER LINEAR FOOT OR OTHER STEEL POSTS HAVING EQUIVALENT STRENGTH AND BENDING RESISTANCE. THE MAXIMUM SPACING SHALL BE 5 FEET. WHEN WIRE OR OTHER FORMS OF APPROVED BACKING ARE USED, THE MAXIMUM SPACING MAY BE INCREASED TO 10 FEET. THE POSTS SHALL BE DRIVEN A MINIMUM OF 18 INCHES INTO THE GROUND OR AS APPROVED BY THE ENGINEER. SPACING MAY NEED TO BE ADJUSTED SO THE POSTS ARE LOCATED IN LOW AREAS WHERE WATER MAY POND. ADDITIONAL POSTS MAY BE REQUIRED IN LOW AREAS. THE POSTS SHALL BE INSTALLED, TRENCH BACKFILLED, AND THE SOIL COMPACTED ON EITHER SIDE OF THE FABRIC TO 95% OF THE SOIL'S STANDARD DENSITY AS DEFINED BY THE STANDARD PROCTOR TEST, ASTM D698. THE WIRE MESH COVERS THE FABRIC MESH ABOVE GROUND.

2. WIRE FENCE SHALL BE A MINIMUM 14 GAUGE WIRE WITH A MAXIMUM 6-INCH MESH OPENING. THE GEOTEXTILE FABRIC SHALL BE FURNISHED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE WIRE FENCE NEEDED TO AVOID SPLICES. WHEN SPLICES ARE NECESSARY, THE FABRIC SHALL BE SPLICED AT A SUPPORT POST AND POSTS TWISTED TOGETHER PER DRAWING SO SILT-LADEN WATER CANNOT ESCAPE AROUND OR BENEATH THE FENCE.

3. THE HEIGHT OF A SILT FENCE SHALL BE A MINIMUM OF 24 INCHES ABOVE THE ORIGINAL GROUND SURFACE. THE SILT FENCE SHALL BE ENTRENCHED TO A MINIMUM DEPTH OF 6 INCHES, WITH AN ADDITIONAL 6 INCHES EXTENDING ALONG THE BOTTOM OF THE TRENCH IN THE UPSLOPE DIRECTION PERPENDICULAR TO THE POSTS. THE 6 INCH EXTENSION OF FABRIC ALONG THE BOTTOM MAY NEED TO BE CUT WHERE TWO FENCES ARE SPLICED PER THE ABOVE MENTIONED METHOD.

4. THE GEOTEXTILE FABRIC AND WIRE SUPPORT, IF USED, MUST BE SECURELY FASTENED TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST ONE INCH LONG OR IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. THE FABRIC SHALL BE ATTACHED TO THE WIRE SUPPORT TO PREVENT SAGGING OF THE FABRIC.

LEGEND

	EXISTING OVERHEAD ELECTRIC		STRAW WATTLE
	EXISTING TREE LINE		RIVERBANK STATIONING
	EXISTING POWER POLE		EXISTING GABION BASKETS (APPROXIMATE EXTENT)
	EXISTING GUY WIRE		LIMITS OF DISTURBANCE
	EXISTING MANHOLE		
	EXISTING MONITORING WELL		
	DO NOT DISTURB		
	TO BE REMOVED AND REPLACED		
	APPROXIMATE LIMITS OF CCR		
	EXISTING TOPO (MAJOR CONTOUR)		
	EXISTING TOPO (MINOR CONTOUR)		
	SILT FENCE		

**PERMIT APPLICATION
DESIGN DRAWING - NOT FOR CONSTRUCTION**

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