Location Restriction Compliance Demonstration

Burlington Generating Station Surface Impoundments
4282 Sullivan Slough Road
Burlington, Iowa 52601

Prepared for:

Interstate Power and Light Company
Burlington Generating Station
4282 Sullivan Slough Road
Burlington, Iowa 52601

SCS ENGINEERS

25219168.00 | October 29, 2020

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

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P.E. CERTIFICATION

10/29/20

I, Eric J. Nelson, hereby certify that the location restriction demonstrations prepared for the surface impoundments at the Burlington Generating Station meet the requirements in 40 CFR 257.61(a), 62(a), and 63(a). This certification is based on my review of the October 2020 Location Restriction Compliance Demonstrations for the surface impoundments prepared by SCS Engineers. I am a duly licensed Professional Engineer under the laws of the State of Iowa.

10/29/2020

(signature) (date)

Eric J. Nelson

(printed or typed name)

License number 23136

My license renewal date is December 31, 2020.

Pages or sheets covered by this seal:

All pages except Appendix A.

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1.0 INTRODUCTION

On behalf of Interstate Power and Light Company (IPL), SCS Engineers (SCS) has prepared the enclosed Location Restriction Compliance Demonstration for the coal combustion residual (CCR) surface impoundments at the Burlington Generating Station (BGS) as required by 40 CFR 257.61-63. The CCR surface impoundments addressed with this demonstration include:

- BGS Ash Seal Pond
- BGS Main Ash Pond
- BGS Economizer Pond
- BGS Upper Ash Pond

Figure 1 shows the site and surface impoundment locations.

2.0 LOCATION RESTRICTIONS

§257.61 *"Wetlands."*

"(a) New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must not be located in wetlands, as defined in §232.2 of this chapter, unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that the CCR unit meets the requirements of paragraphs (a)(1) through (5) of this section."

The existing CCR surface impoundments are not located in wetlands as defined by 40 CFR 232.2. A wetland delineation was performed by Impact7G, Inc. in October 2019. The wetland delineation identified wetland areas adjacent to BGS facilities. All of the delineated wetlands are separated from the CCR surface impoundments by existing embankments. The surface impoundments at BGS were identified as non-wetland areas of industrial ponds and waterways. As described by Impact7G, "these areas were not classified as wetlands as they have been explicitly designed, constructed, and maintained for the treatment and containment of CCR." No wetlands meeting the 40 CFR 232.2 definition were delineated in the surface impoundments. A copy of the wetland delineation report is included in Appendix A.

§257.62 *"Fault areas."*

"(a) New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must not be located within 60 meters (200 feet) of the outermost damage zone of a fault that has had displacement in Holocene time unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that an alternative setback distance of less than 60 meters (200 feet) will prevent damage to the structural integrity of the CCR unit."

Based on a review of the U.S. Geological Survey (USGS) Quaternary faults database and map as shown in Appendix B, the existing CCR surface impoundments are not located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time. In 40 CFR 257.53, Holocene is defined as the most recent epoch of the Quaternary period extending from 11,700 years before present, to present. The USGS map shows that no faults are located in Iowa.

§257.63 *"Seismic impact zones."*

"(a) New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must not be located in seismic impact zones unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that all structural components including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site."

The existing CCR surface impoundments are not located in seismic impact zones. In 40 CFR 257.53, a seismic impact zone is defined as an area having a 2 percent or greater probability that the maximum expected horizontal acceleration, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10 g in 50 years. Based on a review of the USGS 2014 Seismic Hazard Maps (see **Appendix C**), the maximum expected horizontal acceleration for the vicinity of BGS is approximately 0.04-0.06 g, below the threshold for a seismic impact zone.

3.0 REFERENCES

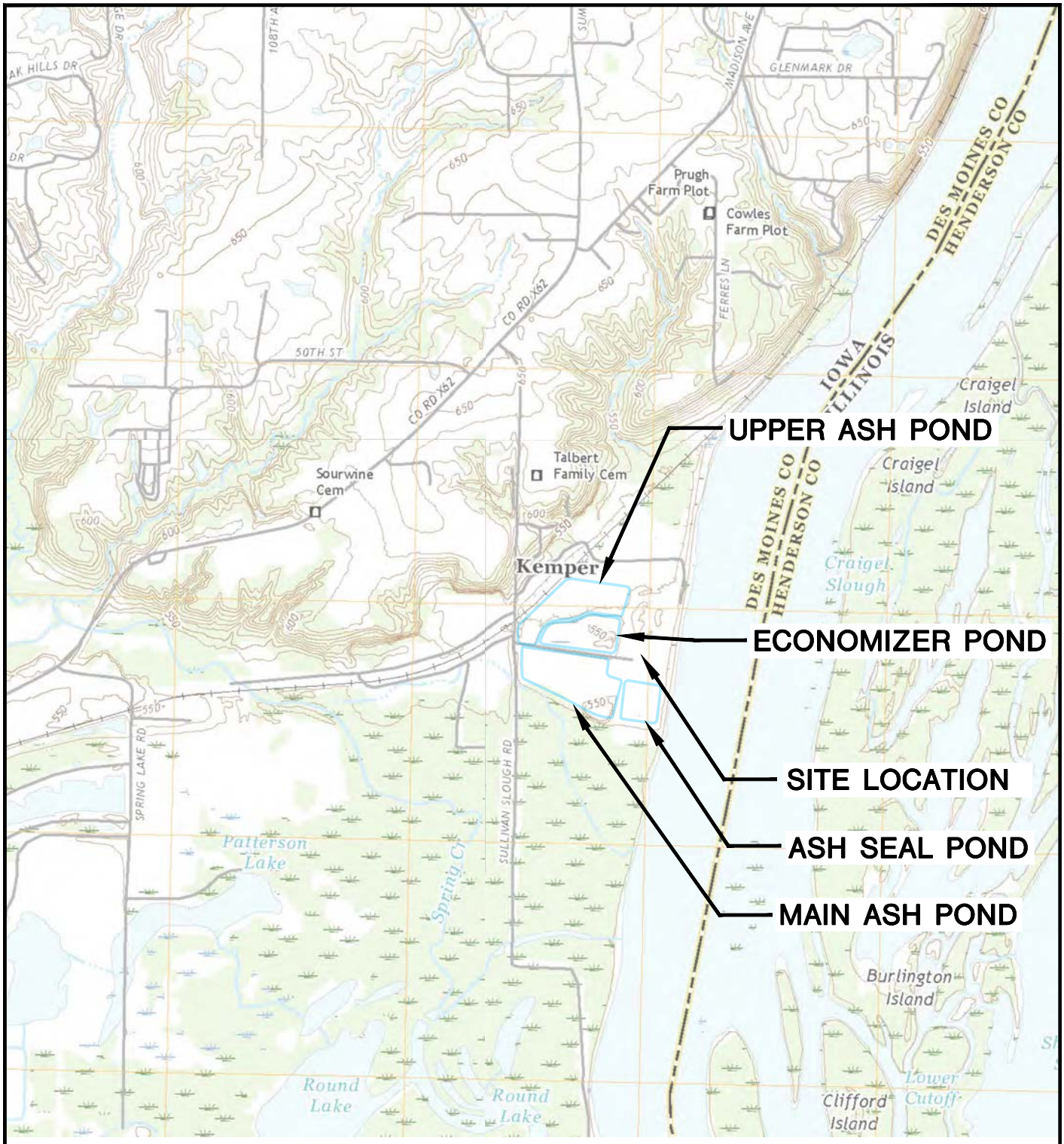
A. Impact7G, Inc., 2020, Wetland Delineation Report Burlington Generating Station Pond Closure, January 6, 2020.

B. USGS Quaternary Faults map website (accessed, 10/21/2020): https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf

C. Petersen, M.D., Moschetti, M.P., Powers, P.M., Mueller, C.S., Haller, K.M., Frankel, A.D., Zeng, Yuehua, Rezaeian, Sanaz, Harmsen, S.C., Boyd, O.S., Field, E.H., Chen, Rui, Luco, Nicolas, Wheeler, R.L., Williams, R.A., Olsen, A.H., and Rukstales, K.S., 2015, Seismic-hazard maps for the conterminous United States, 2014: U.S. Geological Survey Scientific Investigations Map 3325, 6 sheets, scale 1: 7,000,000, http://dx.doi.org/10.3133/sim3325

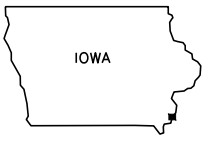
Figure 1

Site Location Map



N

LOMAX QUADRANGLE
ILLINOIS / IOWA–DES MOINES CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'



CLIENT	INTERSTATE POWER AND LIGHT COMPANY 4282 SULLIVAN SLOUGH ROAD BURLINGTON, IA 52601	SITE	ALLIANT ENERGY BURLINGTON GENERATING STATION BURLINGTON, IOWA

SITE LOCATION MAP

PROJECT NO.	25219068.00	DRAWN BY:	BSS
DRAWN:	10/21/2020	CHECKED BY:	PEG
REVISED:	10/21/2020	APPROVED BY:	EJN

ENGINEER
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

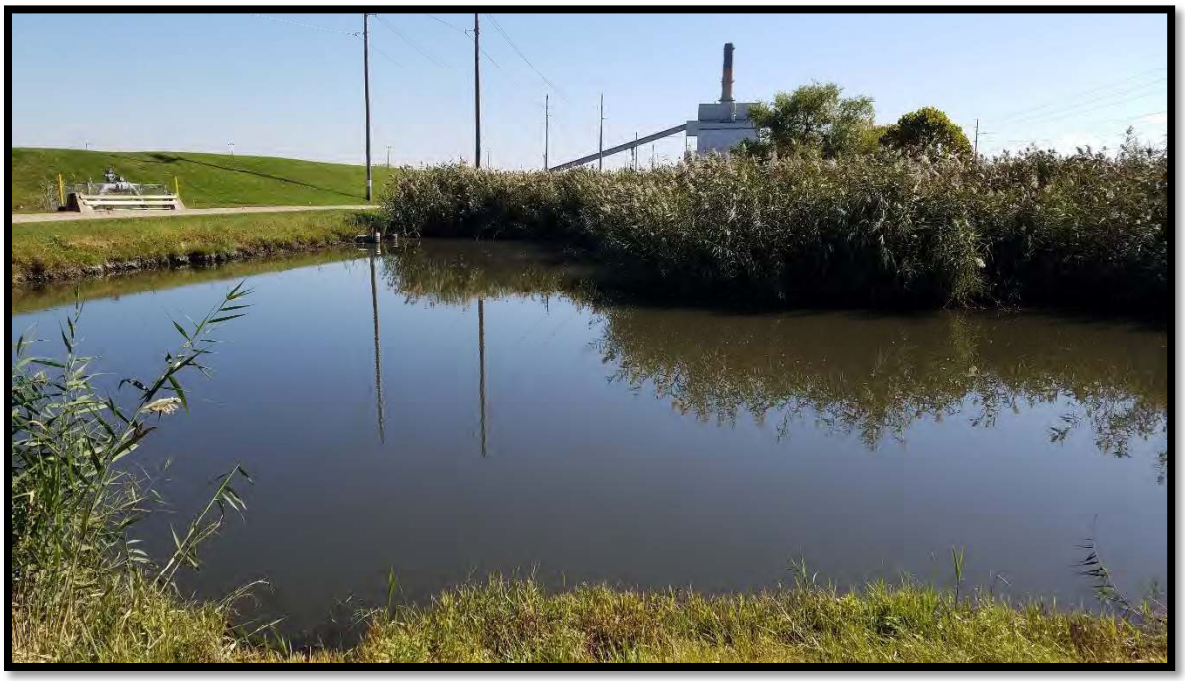
FIGURE 1

I:\25219168.00\Drawings\Location Restriction Demonstration\Site Location Map.dwg, 10/22/2020 9:51:15 AM

Appendix A

Wetland Information

Wetland Delineation Report



Burlington Generating Station Pond Closure

Prepared for:

SCS Engineers
2830 Dairy Drive
Madison, WI 53718

Prepared by:

Impact7G, Inc.
310 Second St.
Coralville, Iowa 52241
Project #: SCS-002

1/6/2020

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1.0 Executive Summary

1.1 Purpose & Need

Impact7G was contracted by SCS Engineers to complete a wetland delineation investigation for a proposed pond closure at the Burlington Generating Station (BGS). The intent of this wetland investigation is to document existing site conditions, at the time of delineation, as may be of consequence to any potential regulatory compliance needs.

1.2 Location

Street Address:	4282 Sullivan Slough Road Burlington, IA 52601
Township:	69N
Range:	02W
Section:	29
Quarter:	SW ¼

See Figure B for Location Map.

1.3 Summary Findings

Impact7G delineated 1.43 total acres of wetland within the Investigation Area, composed of 0.99 acres of emergent wetland and 0.44 acres of forested wetland. Figure A shows delineated wetlands within the Investigation Area.

Potential jurisdiction of wetlands by state or federal agencies is not discussed in this report.

2.0 Methodology: Delineation of Wetlands and Other Waters of the U.S.

2.1 Wetlands

Field analysis was completed using the routine onsite determination method defined in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (USACE, 2010). Delineation data points and wetland boundaries were recorded across the site and associated shapefiles are available upon request.

2.2 Streams & Tributaries

For the purposes of this report, streams & tributaries are characterized by having both a defined bed and bank, and an ordinary high water mark (OHWM).

2.3 Ditches

Any areas identified as ditches within the Investigation Area were specifically designed and are maintained to promote roadway or other drainage. Ditches exhibiting wetland characteristics (hydrophytic vegetation, hydric soils, or wetland hydrology), that were constructed in *upland* areas are not identified as wetlands or other waters of the U.S. For the purposes of this report, ditches or portions of ditches meeting wetland characteristics that were likely constructed in pre-existing wetlands and/or intersect existing wetlands, or

other waters of the U.S., are identified as wetlands. Furthermore, ditches are distinguished herein from streams or tributaries if they lack a defined bed and bank, ordinary high water mark, and perennial flow.

3.0 Discussion of Findings

Wetland delineation fieldwork was completed on 10/17/2019, by:

Will Downey, Certified Wetland Delineator
Reid Stamer, PWS, Certified Wetland Delineator

3.1 Current Conditions

The Burlington Generating Station is a coal power plant facility adjacent to the Mississippi River. Figure F outlines all areas of the BGS currently in use for the storage, capture, and treatment of coal and coal combustion residuals (CCR). These areas were not classified as wetlands as they have been explicitly designed, constructed, and maintained for the treatment and containment of CCR. Within the Investigation Area there are two areas delineated as wetland which are not explicitly designed and used for BGS operations: the wetland ditch between the BGS Upper Ash Pond/railroad and the floodplain forest along the southern boundary of the Investigation Area.

The Palmer Hydrologic Drought Index for the week of the wetland delineation field work indicates wetter than normal conditions (very moist) for the region. Wetland boundaries were readily distinguishable within the Investigation Area according to changes in topography and landscape position, and the presence/absence of visible standing water and saturation within the upper 12" of the soil surface.

Field conditions observed are supported by National Wetland Inventory (NWI) data and minimally supported by SSURGO hydric soils mapping (Figure D). Mapped NWI wetlands within the Investigation Area correspond to the delineated wetland areas as well as the constructed industrial ponds and waterways. Soils within the Investigation Area do not accurately correspond with SSURGO soils mapping, as the site has been disturbed by the construction and operation of the BGS facility and CCR treatment ponds.

The entire Investigation Area is located within either the FEMA National Flood Hazard Layer (NFHL) 0.2% annual chance flood hazard zone or the NFHL 1% annual chance flood hazard zone. The United States Army Corps of Engineers (USACE) has a river monitoring gage for the Mississippi River located upstream from the site in Burlington. At the time of the delineation, the Mississippi River was at approximately 18 feet (Figure G), where flood stage is 15 feet, and major flood stage is 18 feet. Due to the level of flooding within the lowest sections of the Investigation Area, soils or vegetation were inaccessible due to deep standing flood water from the river.

3.2 Wetland Determinations

Emergent wetlands included low-landscape areas in the right of way subject to frequent flooding and high water tables, with vegetation dominated by Kentucky blue grass, reed canary grass, or common reed grass (datapoint S-06). These areas were not considered ditch (as described in Section 2.3, above) due to inundation at the time of field work, potential construction within pre-existing wetland (prior to 1930's), and direct connection with the floodplain of the Mississippi River (20% annual probability flood zone according to flood mapping available from the Iowa Department of Natural Resources [IDNR] / Iowa Flood Center [IFC] Draft Flood Hazard Mapping[1] – Figure H). The area between the railway and the BGS Upper Ash Pond had an open water area (0.24 acres) within the center of the emergent wetland, where vegetation was not visible at the time of field work and does not appear to have distinguishable emergent vegetation in recent aerial imagery. This area is assumed to be nonpersistent emergent wetland, which was flooded at the time of field observation.

[1] https://ifis.iowafloodcenter.org/ifis/newmaps/risk/map/

Forested wetlands are located along the southern boundary of the Investigation Area (datapoint S-07). This wetland area is subject to frequent flooding and high water tables and is dominated by typical floodplain forest species such as silver maple, green ash, and eastern cottonwood. Herbaceous vegetation and soils were not observable during field work due to the depth of flooding, as this area is within the two year flood plain of the Iowa Draft Flood Hazard Map (50% annual probability flood zone –Figure H).

Non-wetland areas including industrial ponds and waterways (labeled on Figure A) were dominated by common reed and other hydrophytic species (data points S-04 & S-05). Wetland hydrology was present in most areas. Soils within these areas were not hydric, composed of a shallow mixture of CCR and fill soils above a barrier of unknown material at approximately 10 inches of depth, where sampled. Furthermore, these areas are considered previously disturbed due to a well-documented history of disturbance and industrial nature of the site. Disturbance history is evident on historic aerial imagery and is described in detail on *Alliant Energy's CCR Rule Compliance Data and Information*[2] website.

Table 1: Delineated Wetland Areas (Cowardin Classification)

Palustrine Wetland Class	Total Acres
Emergent	0.99
Forested	0.44

See also:
Figure A: Wetland Delineation Map
Appendix A: Photos
Appendix B: Wetland Delineation Datasheets

4.0 Regulatory Review

The USACE regulates the discharge of dredged or fill materials into all regulated waters of the United States (WATERS), including wetlands and streams, under Section 404 of the Clean Water Act (USAEWES Environmental Laboratory, 1987). The process of Jurisdictional Determination, conducted by the USACE, may determine that all or part of the WATERS delineated for this project are considered regulated. Based on the information provided, it appears this project may involve filling part of WATERS and therefore may require permits from the USACE and the IDNR prior to beginning work.

The USACE normally requires acquisition of a Section 404 permit and mitigation when any WATERS impact is proposed. In general, there are two types of permits as described below.

Nationwide Permits: A nationwide permit is generally the simplest form of the 404 permits. Wetland loss of 1/2 acre or less is typically permitted under a Nationwide Permit. Stream impacts of 300 linear feet or less are typically permitted under a Nationwide Permit. This permit often requires preconstruction notification to the Corps for impacts to as little as 1/10 of an acre or less. Generally, this permit takes 30 to 45 days to obtain.

Individual Permits: An individual permit requires a full public interest review. A Public Notice is distributed to all known interested persons. After evaluating comments and information received, a final decision on the application is made. The permit decision is generally based on the outcome of a public interest balancing process in which the benefits of the project are balanced against the detriments. A permit will be granted unless the proposal is found to be contrary to the public interest. Processing time usually takes 60 to 120 days unless a public hearing is required or an environmental statement must be prepared.

[2] https://ccr.alliantenergy.com/Burlington/SurfaceImpoundment/DesignCriteria

During the permitting process for either type of permit, the USACE requires that applicants first establish that impacts to WATERS cannot be avoided. Permit applicants then must demonstrate that reasonable efforts to minimize impacts to WATERS have been made in the design and construction plans. Having taken the first two steps, applicants then must provide a plan for compensation, usually through mitigation, for unavoidable impacts. In general, our experience has been that the USACE requires in-kind mitigation be done at a minimum ratio of one (1) to one (1) but may require a compensation ratio of 1.5:1 to 2.5:1 (i.e., two and one-half acres of constructed wetland for every one acre of impact) in some circumstances.

5.0 Conclusions

Impact7G delineated 1.43 total acres of wetland within the Investigation Area, composed of 0.99 acres of emergent wetland and 0.44 acres of forested wetland.

If proposed activities will impact these areas, consultation with the USACE and the IDNR is strongly recommended

This report has been prepared for the exclusive use of our client, and for specific application to the project discussed. To the best of my knowledge the above statements, attachments, including those labeled and identified as enclosures, and all conclusions are true, accurate, and based on current environmental principles and science. No warranties, either expressed or implied, are intended or made. In the event that changes in the nature, design or location of the project as shown are planned, the conclusions and recommendations contained on this form shall not be considered valid unless Impact7G, Inc. reviews the changes and either verifies or modifies the conclusions of this form in writing. This report has been prepared by:

1/6/2020

Prepared by: Will Downey, Environmental Specialist II Date

Reviewed by: Reid Stamer, PWS

References

"Closure Plan for Existing CCR Surface Impoundments." Sargent & Lundy, LLC, prepared for Interstate Power and Light Company. 9, December 2019, https://ccr.alliantenergy.com/-/media/aeccr/CCRDocuments/Burlington/SurfaceImpoundment/ClosurePostClosureCare/WrittenClosurePlan.pdf

Hurt, G.W. (ed.), 2006. Field Indicators of Hydric Soils in the United States, Version 6.0. USDA, NRCS, Baltimore, MD.

"Iowa Flood Risk Maps." Iowa Flood Center. 25, November 2019, https://ifis.iowafloodcenter.org/ifis/newmaps/risk/map/

USAEWES Environmental Laboratory, 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1.

U. S. Army Corps of Engineers (USACE), 2005. Subject: Ordinary High Water Mark Identification. Regulatory Guidance Letter No. 05-05. Date: 12/7/2005.

U. S. Army Corps of Engineers (USACE), 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region. ERDC/EL TR-08-27. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

"USGS 404753091053001 Mississippi River at Burlington, IA." United States Geologic Survey. 9, December 2019, https://waterdata.usgs.gov/nwis/uv?site_no=404753091053001

"Weekly Palmer Drought Indices." *National Oceanic and Atmospheric Administration*, US Department of Commerce, 3 October 2019, https://www.ncdc.noaa.gov/temp-and-precip/drought/weekly-palmers/

GIS & Mapping Layer Sources

All field data shown on maps for wetlands, waterways, bat tree habitat, and data points field-collected and post-processed using ArcGIS by Impact7G Inc., 2019.

Aerial photography provided by Iowa GEODATA (ArcGIS Server)
Source: https://geodata.iowa.gov/

Base-mapping data provided by Iowa GEODATA, including:

- 2-foot contour lines
- USGS 24,000 Topographic Mapping
- National Wetland Inventory (NWI) mapping
- Stream Centerlines in Iowa
- Source: https://geodata.iowa.gov/

Digital SSURGO Soils Data provided by USDA data gateway.
Source: http://datagateway.nrcs.usda.gov/

Iowa Flood Risk Mapping provided by the Iowa Flood Center (ArcGIS Server)
Source: https://ifis.iowafloodcenter.org/ifis/newmaps/risk/map/

Figure A: Wetland Delineation Map

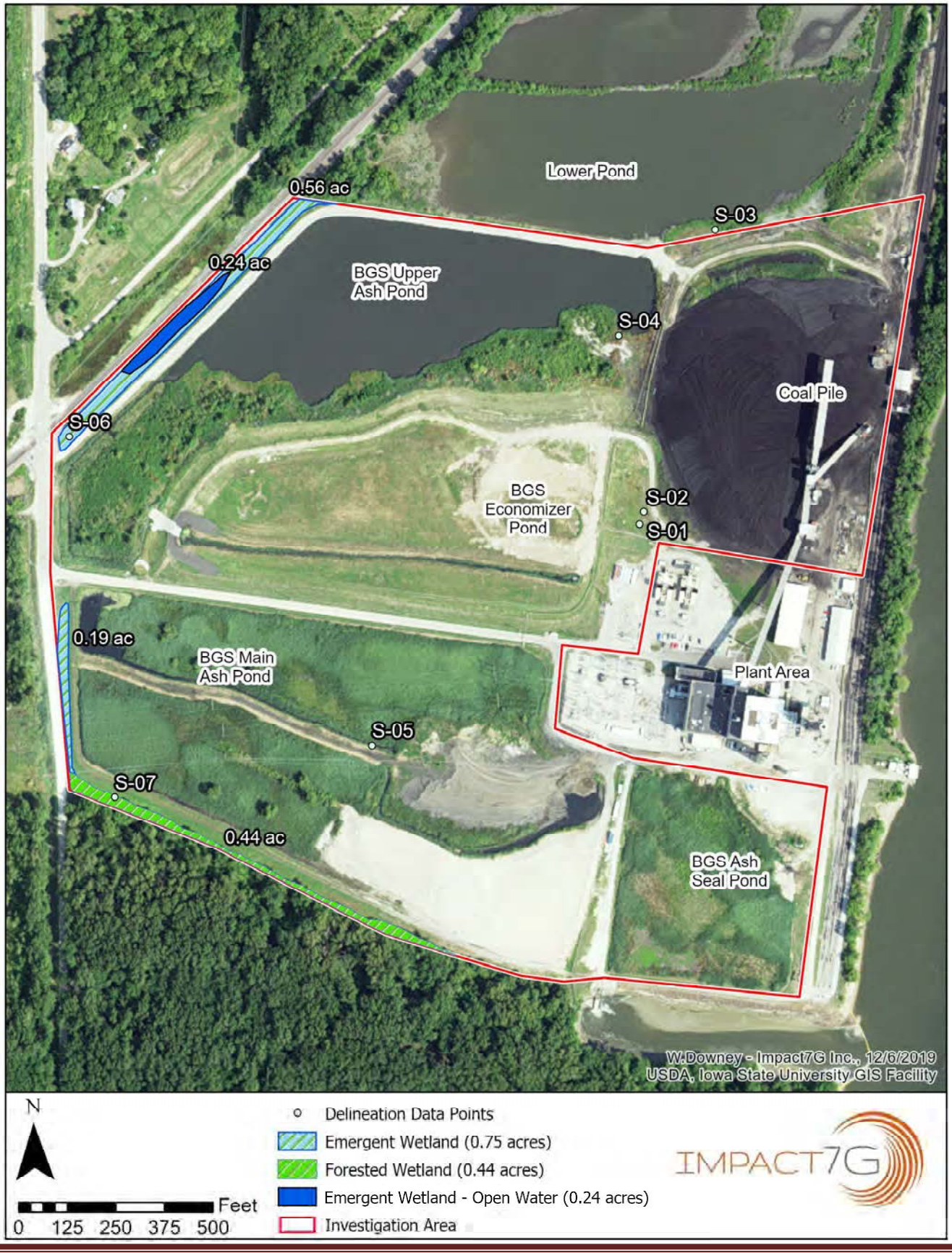


Figure B: Location Map

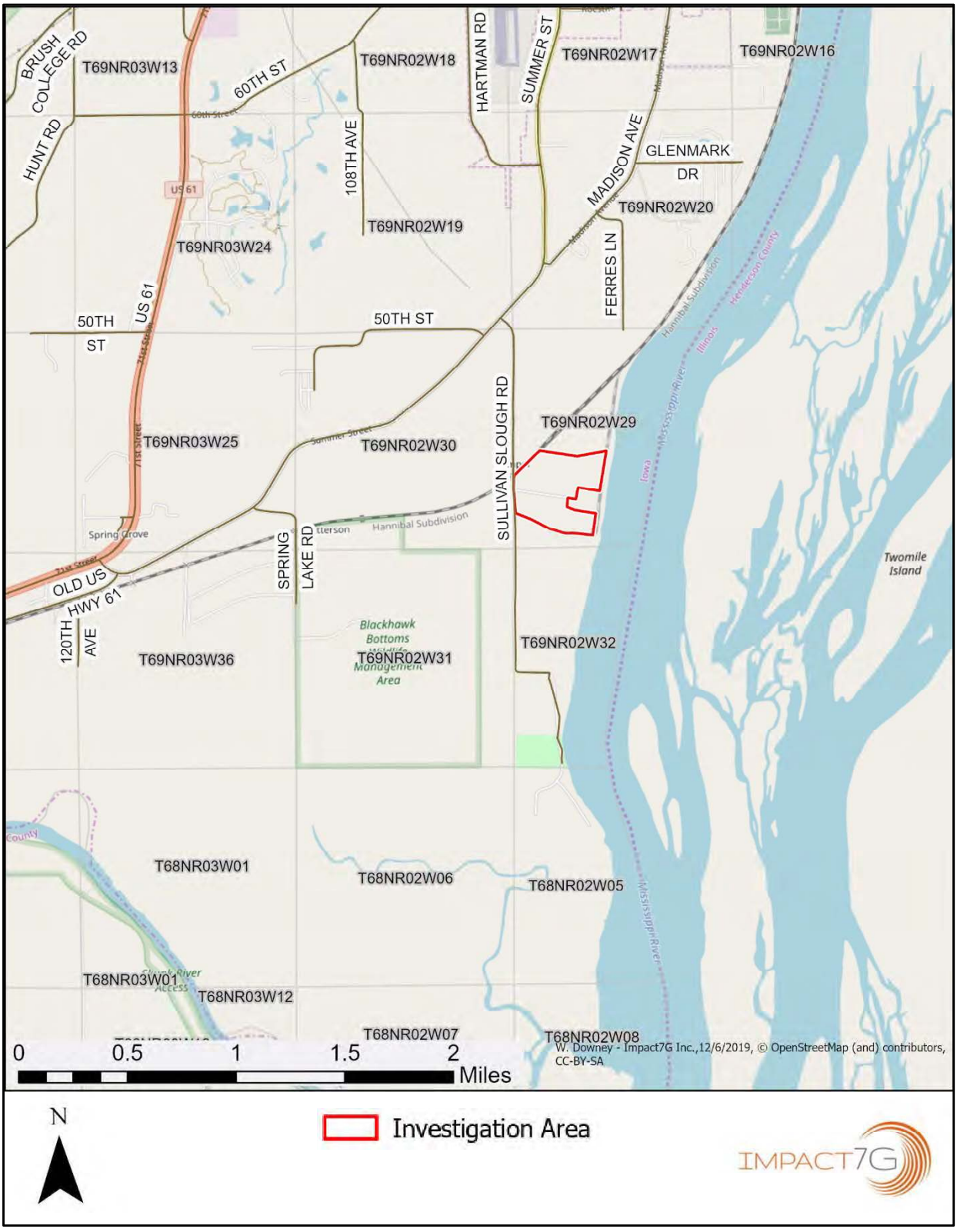


Figure C: USGS Topo 7.5 Minute Quadrangle Map (1:24,000)

Figure D: Soils and National Wetland Inventory (NWI) Map

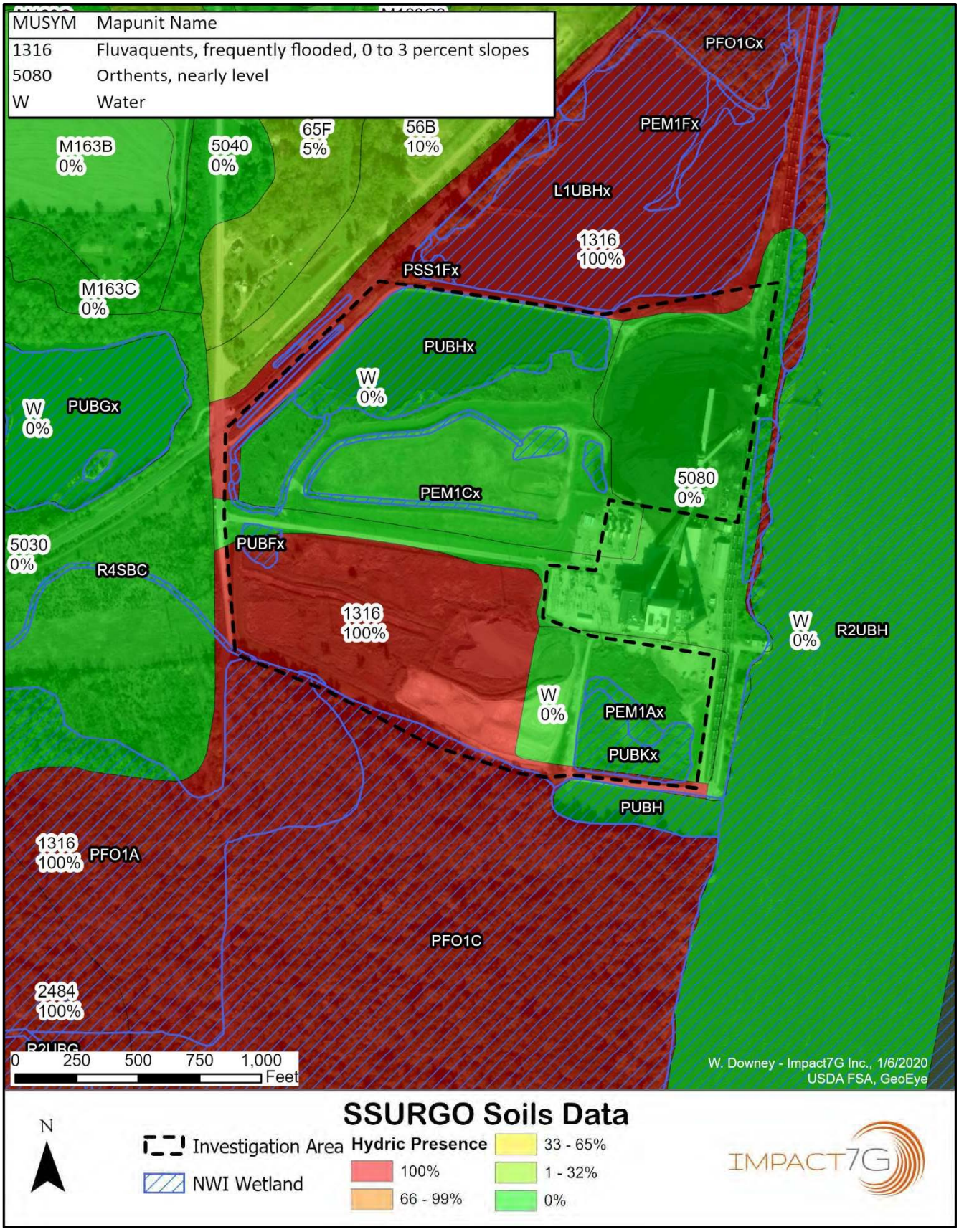


Figure E: FEMA National Flood Hazard Layer

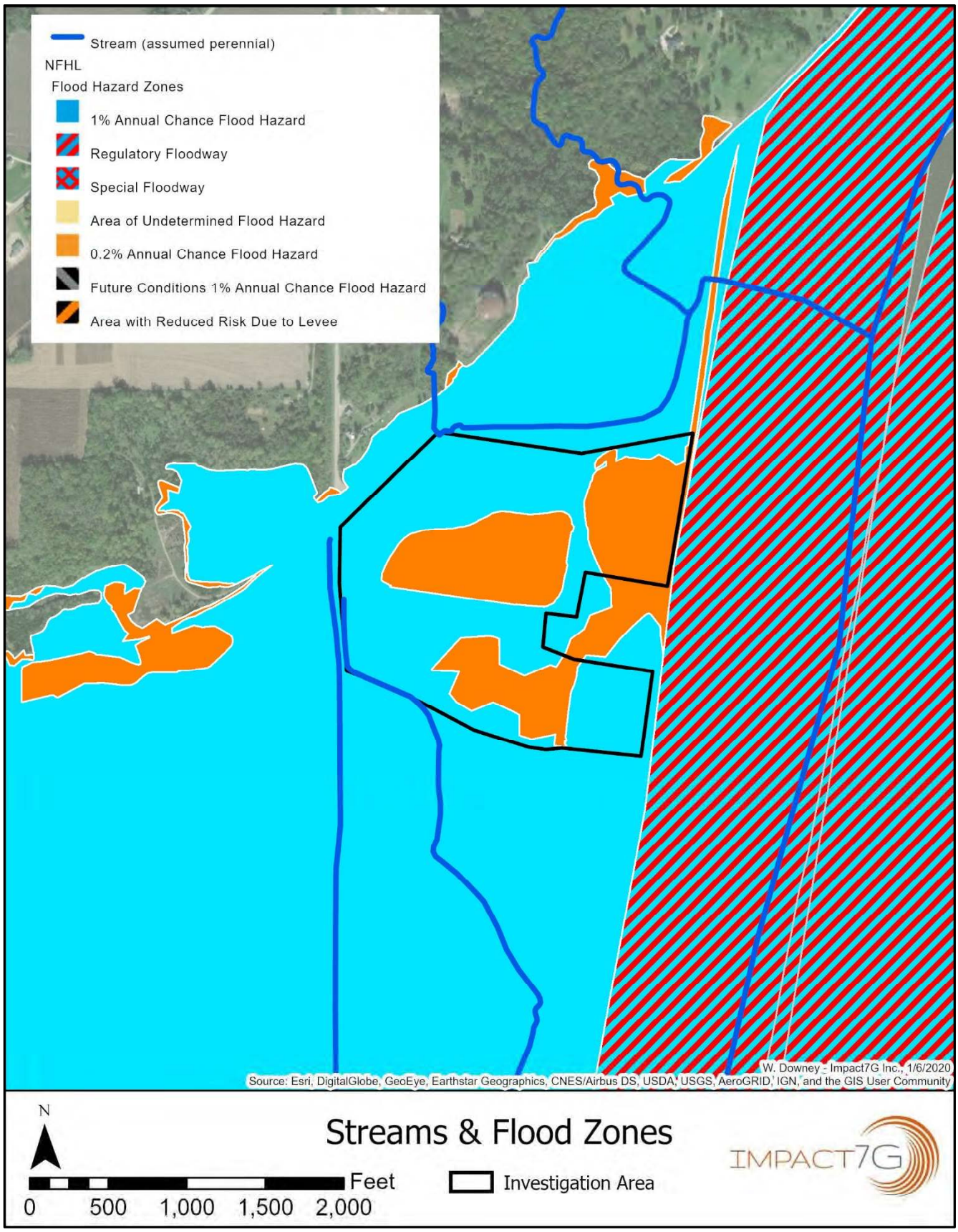


Figure F: BGS Facility Use Map

(From the Alliant Energy: *Closure Plan for Existing CCR [Coal Combustion Residuals] Surface Impoundments*, 2016)

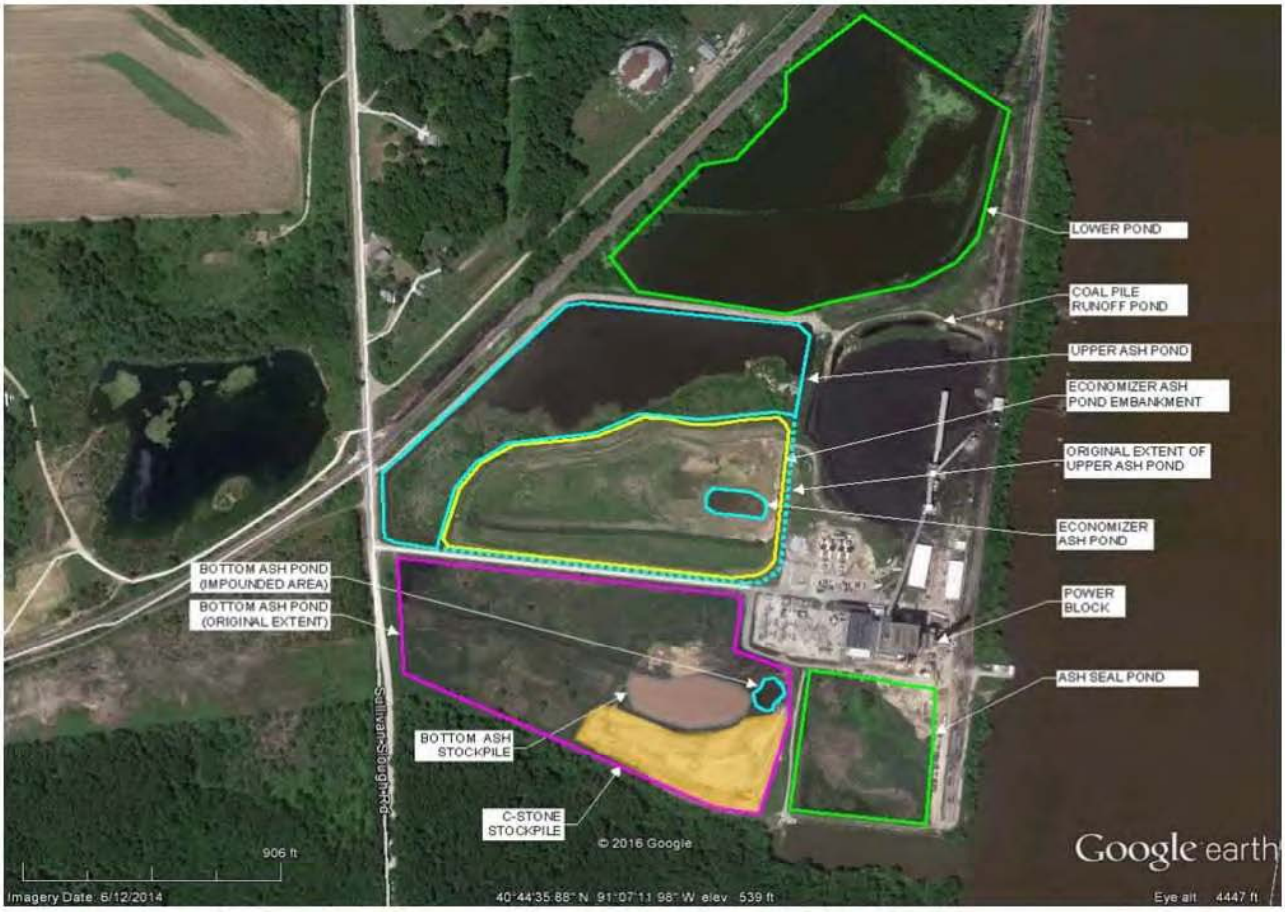


Figure G: Mississippi River Gage at Burlington

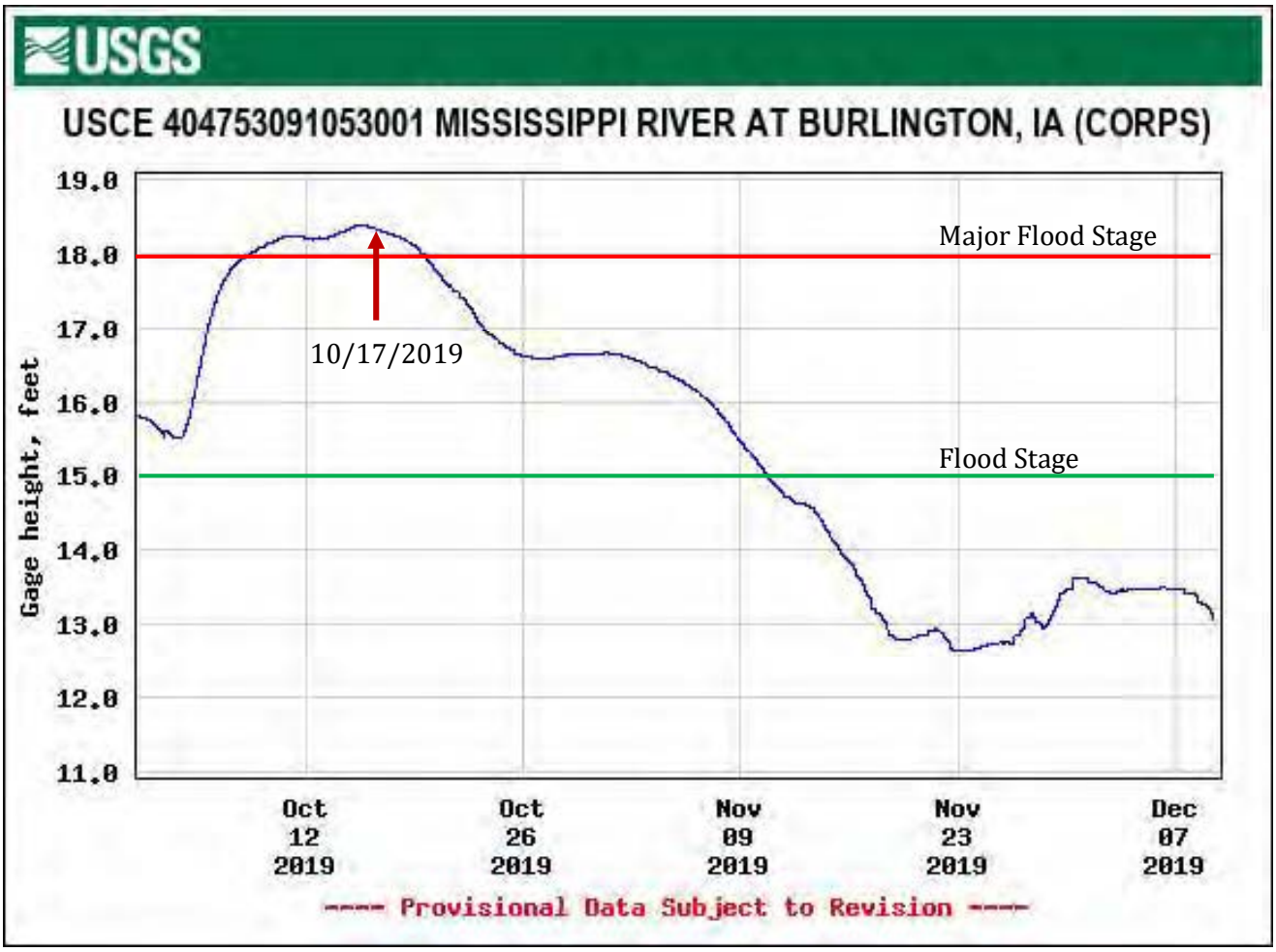
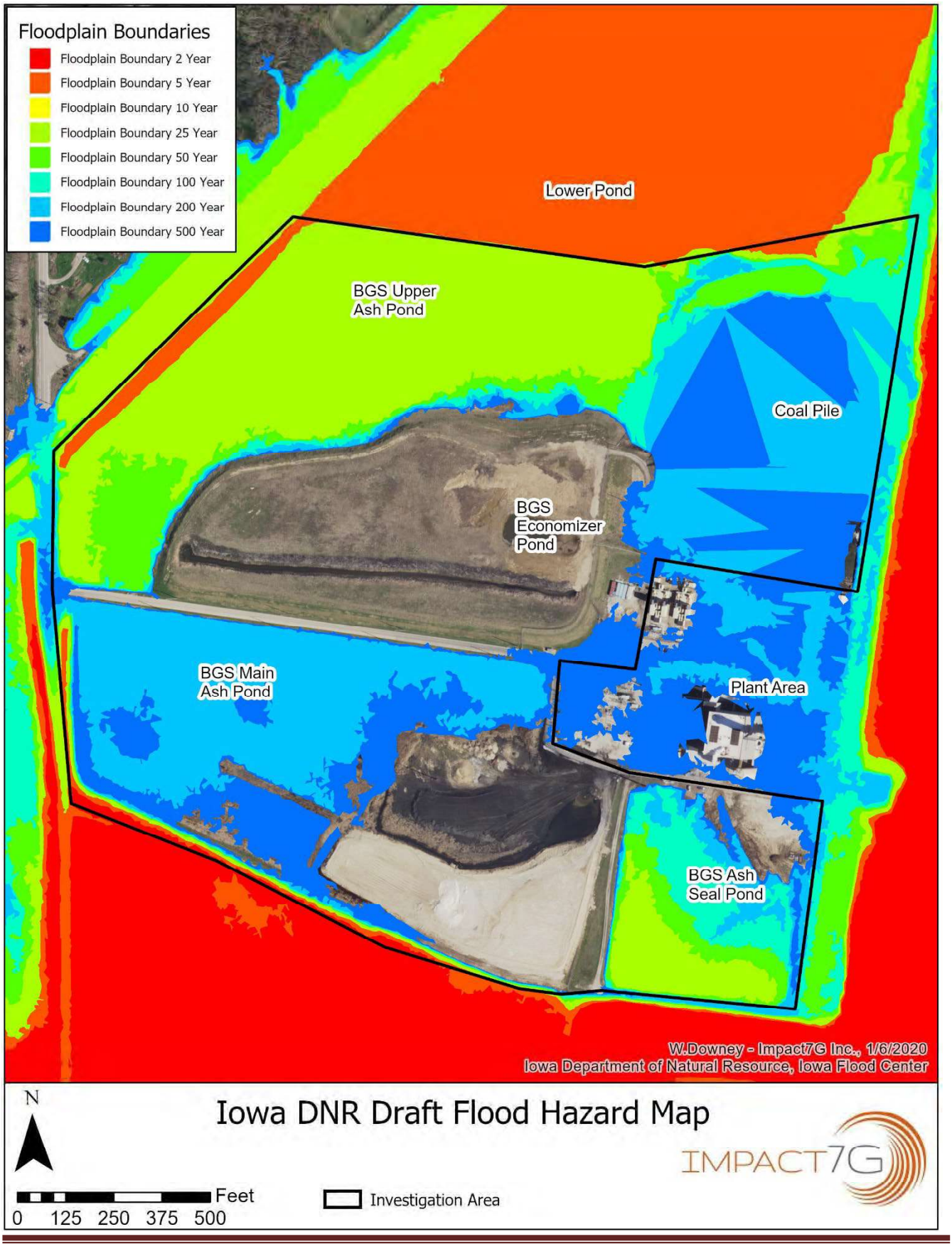


Figure H: IDNR/IFC Draft Flood Hazard Map



Appendix A: Photos

Photo 1: Non-wetland
Data Point S-01
Date: 10/17/2019
Direction: looking north

Photo 2: Non-wetland
Data Point S-02
Date: 10/17/2019
Direction: looking north

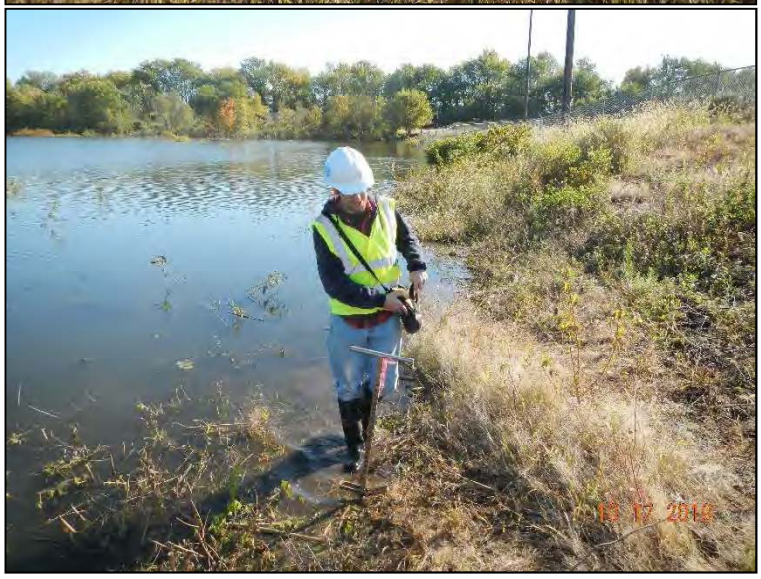


Photo 3: BGS Lower Pond
Data Point S-03
Date: 10/17/2019
Direction: looking east

Photo 4: BGS Upper Ash Pond
Data Point S-04
Date: 10/17/2019
Direction: looking southwest at delineation data point from across pond

Photo 5: Emergent Wetland
Date: 10/17/2019
Direction: looking south at emergent wetland at southwest corner of Investigation Area, within floodplain of Mississippi River

Photo 6: BGC Main Ash Pond
Data Point S-05
Date: 10/17/2019
Direction: looking north at CCR treatment pond, dominated entirely by common reed

Photo 7: Emergent Wetland
Data Point S-06
Date: 10/17/2019
Direction: looking northeast at emergent wetland between railway (left of photo) and BGS Upper Ash Pond (right of photo)

Photo 8: Forested Wetland
Data Point S-07
Date: 10/17/2019
Direction: looking southeast at floodplain forest along southern boundary of Investigation Area

Photo 9: Coal Pile Runoff Pond
Date: 10/17/2019
Direction: looking west, immediately north of the coal pile – non wetland area

Appendix B: Wetland Delineation Data Sheets

Wetland Determination Data Form - Midwest Region

Project/Site: SCS-002 BGS Pond Closure | City/County: Des Moines | Date: 10/17/2019

Applicant/Owner: SCS Engineers | State: IA | Sample Point: S-01

Investigator(s): Impact7G (Will Downey, Reid Stamer) | Section, Township, Range: Section 29 Township 69N Range 02 W

Landform (hillslope, terrace, etc.): River Terrace | Local relief (concave, convex, none): concave

Slope (%) 0-2% | Latitude(dd): 40.74239576 | Longitude(dd): -91.11799645 | Datum NAD 1983 UTM Zone 15N

Soil Map Unit Name: Water

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

Are Vegetation ☑ Soil ☑ or Hydrology ☑ significantly disturbed? | Are "Normal Circumstances" present? ☐ No ☑

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation present? ☐

Hydric Soil present? ☐

Wetland Hydrology present? ☑

Is the Sampled Area within a Wetland? **Wetland** ☐ **Non-Wetland** ☑

Wetland Type:

Remarks:

Moved turf is present over fill material near the mapped NWI. Area is adjacent to coal storage pile. Mississippi River currently at major flood stage, wetter than average conditions.

Vegetation

	Tree Stratum: (Plot size: 30ft radius)	Common Name	Absolute % Cover	Dominant Species?	Status
1.			0		
2.			0		
3.			0		
4.			0		
5.			0		
			0	= Total Cover	
	Sapling/Shrub Stratum: (Plot size:)	Common Name			
1.			0		
2.			0		
3.			0		
4.			0		
5.			0		
			0	= Total Cover	
	Herbaceous Stratum: (Plot size:)	Common Name			
1.	Digitaria ischaemum	Smooth Crab Grass	70	YES	FACU
2.	Poa pratensis	Kentucky Blue Grass	30	YES	FAC
3.	Setaria pumila	Yellow Bristle Grass	7	NO	FAC
4.	Rumex crispus	Curly Dock	5	NO	FAC
5.	Typha angustifolia	Narrow-Leaf Cat-Tail	3	NO	OBL
6.	Phragmites australis	Common Reed	3	NO	FACW
7.			0		
8.			0		
9.			0		
10.			0		
			118	= Total Cover	
	Vine Stratum: (Plot size: 30ft radius)	Common Name			
1.			0		
2.			0		
			0	= Total Cover	

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

Mowed turf.

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevelance Index worksheet:

Total % Cover of:		Multiply by:	
OBL species:	3	x 1	3
FACW species:	3	x 2	6
FAC species:	42	x 3	126
FACU species:	70	x 4	280
UPL species:	0	x 5	0
Column Totals:	118 (A)		415 (B

Prevalence Index = B/A = 3.52

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☐ No ☑

Soils

Sample Point: S-01

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks:
0-2	2.5Y 3/1						l	
2-3	2.5Y 5/1		7.5YR 4/4	15	C	M	sil	
3-8	10YR 5/4	85					sil	
	10YR 5/2	15					sil	
8-10	10YR 2.5/1						sil	Fly ash

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Restricted on Rocks Depth (inches): 10

Hydric Soil Present? Yes ☐ No ☑

Soil Remarks:

The sample location is disturbed with coal and fly ash in some areas. No indicators met.

Hydrology

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturated in Upper 12" (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches)

Water Table Present? Yes ☑ No ☐ Depth (inches): 1 in

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0 in

Wetland Hydrology Present? Yes ☑ No ☐

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

Hydrology Remarks:

The sample point exists within the Mississippi River floodplain, which is commonly flooded.

Wetland Determination Data Form - Midwest Region

Project/Site: SCS-002 BGS Pond Closure | City/County: Des Moines | Date: 10/17/2019

Applicant/Owner: SCS Engineers | State: IA | Sample Point: S-02

Investigator(s): Impact7G (Will Downey, Reid Stamer) | Section, Township, Range: Section 29 Township 69N Range 02 W

Landform (hillslope, terrace, etc.): River Terrace | Local relief (concave, convex, none): concave

Slope (%) 0-2% | Latitude(dd): 40.74248148 | Longitude(dd): -91.11795368 | Datum NAD 1983 UTM Zone 15N

Soil Map Unit Name: Water

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

Are Vegetation ☑ Soil ☑ or Hydrology ☑ significantly disturbed? | Are "Normal Circumstances" present? ☐ No ☑

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation present? ☐

Hydric Soil present? ☐

Wetland Hydrology present? ☑

Is the Sampled Area within a Wetland? **Wetland** ☐ **Non-Wetland** ☑ Wetland Type:

Remarks:

Standing water is present at the smaple point. Swimming water bugs were identified at this location. (Water Boatman - Corixidae). Area is mowed and adjacent to coal storage pile. Mississippi River currently at major flood stage, wetter than average conditions.

Vegetation

	Tree Stratum: (Plot size: 30ft radius)	Common Name	Absolute % Cover	Dominant Species?	Status
1.			0		
2.			0		
3.			0		
4.			0		
5.			0		
			0 = Total Cover		
	Sapling/Shrub Stratum: (Plot size:)	Common Name			
1.			0		
2.			0		
3.			0		
4.			0		
5.			0		
			0 = Total Cover		
	Herbaceous Stratum: (Plot size:)	Common Name			
1.	Portulaca Oleracea	Little-Hogweed	60	YES	FACU
2.	Typha angustifolia	Narrow-Leaf Cat-Tail	20	YES	OBL
3.	Digitaria ischaemum	Smooth Crab Grass	15	NO	FACU
4.	Eleocharis acicularis	Needle Spike-Rush	3	NO	OBL
5.			0		
6.			0		
7.			0		
8.			0		
9.			0		
10.			0		
			98 = Total Cover		
	Vine Stratum: (Plot size: 30ft radius)	Common Name			
1.			0		
2.			0		
			0 = Total Cover		

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

The vegetation is more sparce around the sample point than in the surrounding area.

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevelance Index worksheet:

Total % Cover of:		Multiply by:	
OBL species:	23	x 1	23
FACW species:	0	x 2	0
FAC species:	0	x 3	0
FACU species:	75	x 4	300
UPL species:	0	x 5	0
Column Totals:	98 (A)		323 (B

Prevalence Index = B/A = 3.30

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☐ No ☑

Soils

Sample Point: S-02

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks:
0-1			10YR 5/6		C	M	sil	
1-10								Fly Ash

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Soil Remarks:

Fly ash present in soil profile. No indicators met.

Hydrology

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturated in Upper 12" (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☑ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches) 5 in

Water Table Present? Yes ☑ No ☐ Depth (inches): 0 in

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0 in

Wetland Hydrology Present? Yes ☑ No ☐

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

Hydrology Remarks:

The area contains standing water -- likely due to flooding or Mississippi and/or unseasonably wet growing season.

Wetland Determination Data Form - Midwest Region

Project/Site: SCS-002 BGS Pond Closure | City/County: Des Moines | Date: 10/17/2019

Applicant/Owner: SCS Engineers | State: IA | Sample Point: S-03

Investigator(s): Impact7G (Will Downey, Reid Stamer) | Section, Township, Range: Section 29 Township 69N Range 02 W

Landform (hillslope, terrace, etc.): Pond Slope | Local relief (concave, convex, none): concave

Slope (%) 2-5% | Latitude(dd): 40.74445837 | Longitude(dd): -91.11722153 | Datum NAD 1983 UTM Zone 15N

Soil Map Unit Name: Fluvaquents, frequently flooded, 0 to 3 percent slopes

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

Are Vegetation ☐ Soil ☑ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? ☐ No ☑

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation present? ☑

Hydric Soil present? ☐

Wetland Hydrology present? ☑

Is the Sampled Area within a Wetland? **Wetland** ☐ **Non-Wetland** ☑ Wetland Type:

Remarks:

The sample point was taken on the edge of the detention basin, in a 10ft area of wetland fringe. Area is designed and used for containment and treatment of fly ash. Mississippi River currently at major flood stage, wetter than average conditions.

Vegetation

	Tree Stratum: (Plot size: 30ft radius)	Common Name	Absolute % Cover	Dominant Species?	Status
1.			0		
2.			0		
3.			0		
4.			0		
5.			0		
			0 = Total Cover		
	Sapling/Shrub Stratum: (Plot size:)	Common Name			
1.	Cephalanthus occidentalis	Common Buttonbush	5	YES	OBL
2.			0		
3.			0		
4.			0		
5.			0		
			5 = Total Cover		
	Herbaceous Stratum: (Plot size:)	Common Name			
1.	Hibiscus laevis	Halberd-Leaf Rose-Mallow	40	YES	OBL
2.	Panicum capillare	Common Panic Grass	30	YES	FAC
3.	Persicaria pensylvanica	Pinkweed	10	NO	FACW
4.	Lemna minor	Common Duckweed	7	NO	OBL
5.	Iris virginica	Virginia Blueflag	5	NO	OBL
6.	Fraxinus pennsylvanica	Green Ash	1	NO	FACW
7.			0		
8.			0		
9.			0		
10.			0		
			93 = Total Cover		
	Vine Stratum: (Plot size: 30ft radius)	Common Name			
1.			0		
2.			0		
			0 = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, OR FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species:	57	x 1	57
FACW species:	11	x 2	22
FAC species:	30	x 3	90
FACU species:	0	x 4	0
UPL species:	0	x 5	0
Column Totals:	98 (A)		169 (B

Prevalence Index = B/A = 1.72

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☑ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Soils

Sample Point: S-03

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks:
0-4	N2.5							Coal / Fly ash
4-10	10YR 2/1		7.5YR 3/4	20			I	Fly ash intermixed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Soil Remarks:

Fly ash present in soil profile. No indicators met.

Hydrology

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturated in Upper 12" (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches) 0-3 ft

Water Table Present? Yes ☐ No ☑ Depth (inches):

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Hydrology Remarks:

Sample point consists of a mapped NWI area, which may be a fly ash pond / detonation basin.

Wetland Determination Data Form - Midwest Region

Project/Site: SCS-002 BGS Pond Closure | City/County: Des Moines | Date: 10/17/2019

Applicant/Owner: SCS Engineers | State: IA | Sample Point: S-04

Investigator(s): Impact7G (Will Downey, Reid Stamer) | Section, Township, Range: Section 29 Township 69N Range 02 W

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

Slope (%) 0-2% | Latitude(dd): 40.74372947 | Longitude(dd): -91.11814059 | Datum NAD 1983 UTM Zone 15N

Soil Map Unit Name: Water

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

Are Vegetation ☐ Soil ☑ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? ☐ No ☑

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation present? ☑

Hydric Soil present? ☐

Wetland Hydrology present? ☑

Is the Sampled Area within a Wetland? **Wetland** ☐ **Non-Wetland** ☑ Wetland Type:

Remarks:

The sample point was taken at the edge of the detention basin and pond fringe. Area is designed and used for containment and treatment of fly ash. Mississippi River currently at major flood stage, wetter than average conditions.

Vegetation

Tree Stratum: Plot size: 30ft radius	Common Name	Absolute % Cover	Dominant Species?	Status
1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
		0 = Total Cover		
Sapling/Shrub Stratum: Plot size:	Common Name			
1. Amorphra fruticosa	False Indigo-Bush	7	YES	FACW
2. Fraxinus pennsylvanica	Green Ash	2	YES	FACW
3.		0		
4.		0		
5.		0		
		9 = Total Cover		
Herbaceous Stratum: Plot size:	Common Name			
1. Phragmites australis	Common Reed	70	YES	FACW
2. Panicum capillare	Common Panic Grass	40	YES	FAC
3. Eleocharis acicularis	Needle Spike-Rush	20	NO	OBL
4. Phalaris arundinacea	Reed Canary Grass	20	NO	FACW
5. Bidens cernua	Nodding Burr-Marigold	5	NO	OBL
6. Asclepias incarnata	Swamp Milkweed	2	NO	OBL
7.		0		
8.		0		
9.		0		
10.		0		
		157 = Total Cover		
Vine Stratum: Plot size: 30ft radius	Common Name			
1.		0		
2.		0		
		0 = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, OR FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevelance Index worksheet:

Total % Cover of:		Multiply by:	
OBL species:	27	x 1	27
FACW species:	99	x 2	198
FAC species:	40	x 3	120
FACU species:	0	x 4	0
UPL species:	0	x 5	0
Column Totals:	166 (A)		345 (B

Prevalence Index = B/A = 2.08

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☑ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Soils

Sample Point: S-04

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks:
0-3	N2.5							Fly Ash
3-10	2.5Y 4/1							Refused

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Soil Remarks:

Fly ash present in soil profile - no indicators met

Hydrology

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturated in Upper 12" (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches) 0-2 in

Water Table Present? Yes ☑ No ☐ Depth (inches): 0 in

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0 in

Wetland Hydrology Present? Yes ☑ No ☐

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

Hydrology Remarks:

Fringe of detention pond.

Wetland Determination Data Form - Midwest Region

Project/Site: SCS-002 BGS Pond Closure | City/County: Des Moines | Date: 10/17/2019

Applicant/Owner: SCS Engineers | State: IA | Sample Point: S-05

Investigator(s): Impact7G (Will Downey, Reid Stamer) | Section, Township, Range: Section 29 Township 69N Range 02 W

Landform (hillslope, terrace, etc.): Detention Pond | Local relief (concave, convex, none): concave

Slope (%) 0-2% | Latitude(dd): 40.74088333 | Longitude(dd): -91.12053372 | Datum NAD 1983 UTM Zone 15N

Soil Map Unit Name: Fluvaquents, frequently flooded, 0 to 3 percent slopes

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

Are Vegetation ☐ Soil ☑ or Hydrology ☑ significantly disturbed? | Are "Normal Circumstances" present? ☐ No ☑

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation present? ☑

Hydric Soil present? ☐

Wetland Hydrology present? ☑

Is the Sampled Area within a Wetland? **Wetland** ☐ **Non-Wetland** ☑ Wetland Type:

Remarks:

The sample point consists of a detention pond and a channel below a fly ash pile. Area is designed and used for containment and treatment of fly ash. Mississippi River currently at major flood stage, wetter than average conditions.

Vegetation

	Tree Stratum: (Plot size: 30ft radius)	Common Name	Absolute % Cover	Dominant Species?	Status
1.			0		
2.			0		
3.			0		
4.			0		
5.			0		
			0 = Total Cover		
	Sapling/Shrub Stratum: (Plot size:)	Common Name			
1.			0		
2.			0		
3.			0		
4.			0		
5.			0		
			0 = Total Cover		
	Herbaceous Stratum: (Plot size:)	Common Name			
1.	Phragmites australis	Common Reed	100	YES	FACW
2.			0		
3.			0		
4.			0		
5.			0		
6.			0		
7.			0		
8.			0		
9.			0		
10.			0		
			100 = Total Cover		
	Vine Stratum: (Plot size: 30ft radius)	Common Name			
1.			0		
2.			0		
			0 = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species:	0	x 1	0
FACW species:	100	x 2	200
FAC species:	0	x 3	0
FACU species:	0	x 4	0
UPL species:	0	x 5	0
Column Totals:	100 (A)		200 (B

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☑ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Soils

Sample Point: S-05

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks:
0-10	N2.5						I	Fly Ash

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Soil Remarks:

Fly ash present in soil profile. No indicators met.

Hydrology

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturated in Upper 12" (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches) 4 in

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0 In

Wetland Hydrology Present? Yes ☑ No ☐

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

Hydrology Remarks:

Wetland Determination Data Form - Midwest Region

Project/Site: SCS-002 BGS Pond Closure | City/County: Des Moines | Date: 10/17/2019

Applicant/Owner: SCS Engineers | State: IA | Sample Point: S-06

Investigator(s): Impact7G (Will Downey, Reid Stamer) | Section, Township, Range: Section 29 Township 69N Range 02 W

Landform (hillslope, terrace, etc.): River terrace / ditch | Local relief (concave, convex, none): concave

Slope (%) 0-2% | Latitude(dd): 40.7431004 | Longitude(dd): -91.1232744 | Datum NAD 1983 UTM Zone 15N

Soil Map Unit Name: Fluvaquents, frequently flooded, 0 to 3 percent slopes

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

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? | Are "Normal Circumstances" present? ☐ No ☑

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation present? ☑
Hydric Soil present? ☑
Wetland Hydrology present? ☑

Is the Sampled Area within a Wetland? **Wetland** ☑ **Non-Wetland** ☐

Wetland Type: emergent wetland

Remarks:

Area mapped as 100% hydric soils, partially NWI wetland. Area is located between berm of upper fly ash pond and railroad bed that does not appear to be an active cell of the BGS pond facility. Mississippi River currently at major flood stage.

Vegetation

	Tree Stratum: (Plot size: 30ft radius)	Common Name	Absolute % Cover	Dominant Species?	Status
1.			0		
2.			0		
3.			0		
4.			0		
5.			0		
			0 = Total Cover		
	Sapling/Shrub Stratum: (Plot size:)	Common Name			
1.			0		
2.			0		
3.			0		
4.			0		
5.			0		
			0 = Total Cover		
	Herbaceous Stratum: (Plot size:)	Common Name			
1.	Phragmites australis	Common Reed	90	YES	FACW
2.			0		
3.			0		
4.			0		
5.			0		
6.			0		
7.			0		
8.			0		
9.			0		
10.			0		
			90 = Total Cover		
	Vine Stratum: (Plot size: 30ft radius)	Common Name			
1.			0		
2.			0		
			0 = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species:	0	x 1	0
FACW species:	90	x 2	180
FAC species:	0	x 3	0
FACU species:	0	x 4	0
UPL species:	0	x 5	0
Column Totals:	90 (A)		180 (B

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☑ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Soils

Sample Point: S-06

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks:

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☑ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Soil Remarks:

Area flooded / no soil return - mapped as 100% hydric soil presence (Fluvaquents, frequently flooded). Assumed to be hydric. Edges/slopes of wet area lined with rip-rap.

Hydrology

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturated in Upper 12" (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches) 24+

Water Table Present? Yes ☑ No ☐ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Hydrology Remarks:

Center of wetland is open water on aerial imagery, vegetation is not visible

Wetland Determination Data Form - Midwest Region

Project/Site: SCS-002 BGS Pond Closure | City/County: Des Moines | Date: 10/17/2019

Applicant/Owner: SCS Engineers | State: IA | Sample Point: S-07

Investigator(s): Impact7G (Will Downey, Reid Stamer) | Section, Township, Range: Section 29 Township 69N Range 02 W

Landform (hillslope, terrace, etc.): Floodplain | Local relief (concave, convex, none): concave

Slope (%) 0-2% | Latitude(dd): 40.7405565 | Longitude(dd): -91.1229292 | Datum NAD 1983 UTM Zone 15N

Soil Map Unit Name: Fluvaquents, frequently flooded, 0 to 3 percent slopes

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

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? ☑ No ☐

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation present? ☑
Hydric Soil present? ☑
Wetland Hydrology present? ☑

Is the Sampled Area within a Wetland? **Wetland** ☑ **Non-Wetland** ☐

Wetland Type: floodplain forest

Remarks:

Floodplain forest along toe of slope of the Burlington Generating Station Fly Ash Facility. Area is currently flooded with 2-3 feet or more of standing water and extends to the south outside of the propert boundary (Mississippi River at major flood stage).

Vegetation

	Tree Stratum: (Plot size: 30ft radius)	Common Name	Absolute % Cover	Dominant Species?	Status
1.	Acer saccharinum	Silver Maple	80	YES	FACW
2.	Fraxinus pennsylvanica	Green Ash	40	YES	FACW
3.	Populus deltoides	Eastern Cottonwood	20	NO	FAC
4.			0		
5.			0		
			140	= Total Cover	

	Sapling/Shrub Stratum: (Plot size:)	Common Name	Absolute % Cover	Dominant Species?	Status
1.			0		
2.			0		
3.			0		
4.			0		
5.			0		
			0	= Total Cover	

	Herbaceous Stratum: (Plot size:)	Common Name	Absolute % Cover	Dominant Species?	Status
1.	Phragmites australis	Common Reed	5	YES	FACW
2.			0		
3.			0		
4.			0		
5.			0		
6.			0		
7.			0		
8.			0		
9.			0		
10.			0		
			5	= Total Cover	

	Vine Stratum: (Plot size: 30ft radius)	Common Name	Absolute % Cover	Dominant Species?	Status
1.			0		
2.			0		
			0	= Total Cover	

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

Herbaceaous species covered by flood waters

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, OR FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species:	0	x 1	0
FACW species:	125	x 2	250
FAC species:	20	x 3	60
FACU species:	0	x 4	0
UPL species:	0	x 5	0
Column Totals:	145 (A)		310 (B

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☑ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Soils

Sample Point: S-07

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks:

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☑ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Soil Remarks:

Water too deep to collect soil. Mapped as 100% hydric fluvaquents, within floodplain, assumed to be hydric

Hydrology

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturated in Upper 12" (A3)
- ☑ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches) 36+

Water Table Present? Yes ☑ No ☐ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

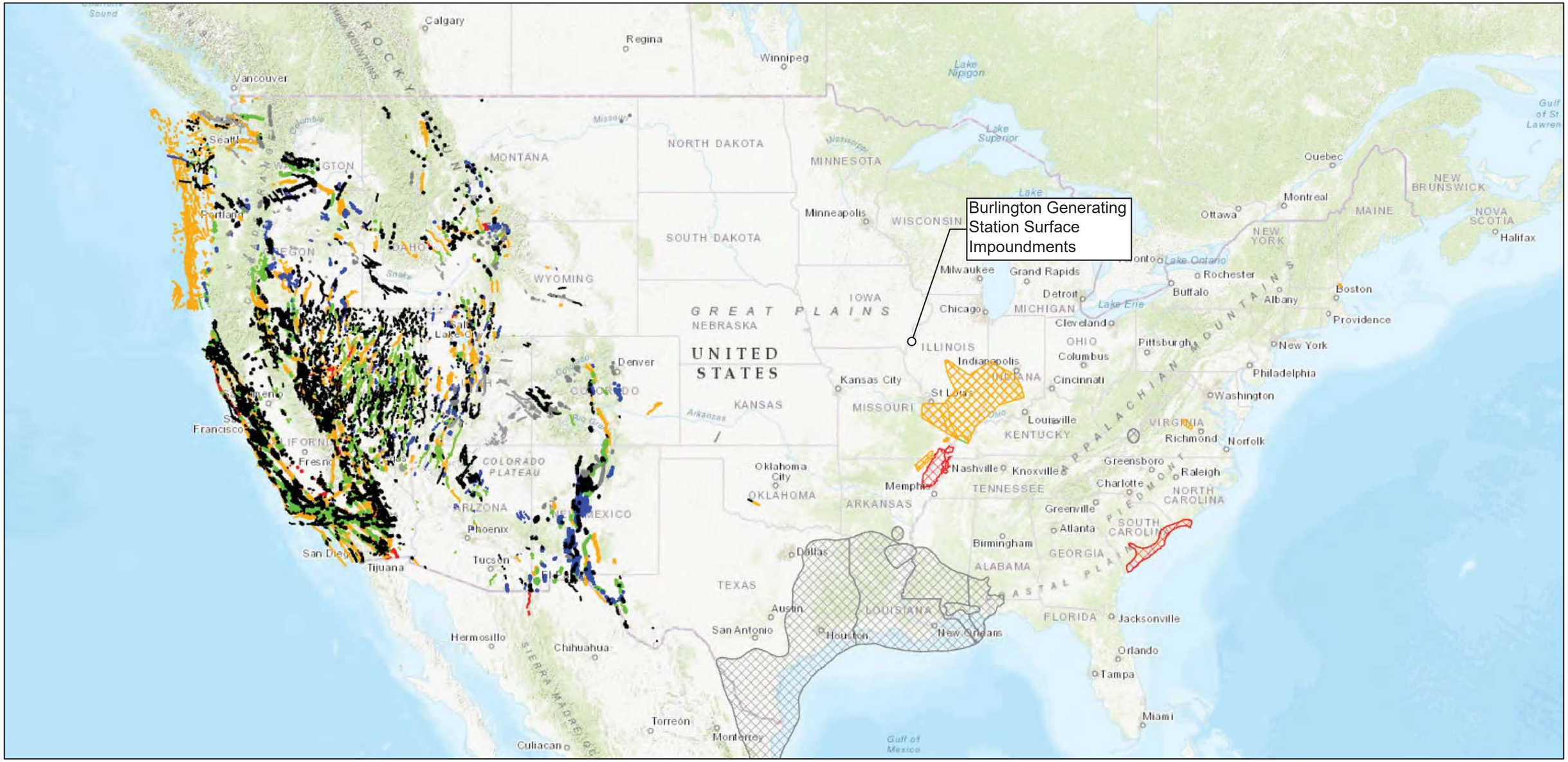
Hydrology Remarks:

Area entirely inundated along contour

Appendix B

Fault Location Map

U.S. Geological Survey Quaternary Faults



10/21/2020, 11:38:11 AM

Fault Areas

- Class B
- historic
- late Quaternary
- latest Quaternary
- middle and late Quaternary

National Database

- Historic (< 150 years), well constrained location
- Historic (< 150 years), moderately constrained location
- Historic (< 150 years), inferred location
- Latest Quaternary (<15,000 years), well constrained location
- Latest Quaternary (<15,000 years), moderately constrained location
- Latest Quaternary (<15,000 years), inferred location
- Late Quaternary (< 130,000 years), well constrained location
- Late Quaternary (< 130,000 years), moderately contrained location
- Late Quaternary (< 130,000 years), inferred location
- Middle and late Quaternary (< 750,000 years), well constrained location
- Middle and late Quaternary (< 750,000 years), moderately constrained location
- Middle and late Quaternary (< 750,000 years), inferred location

1:20,160,750

0 935,399.051,870,798.1 3,741,596.2 ft

0 287,125 574,250 1,148,500 m

USGS

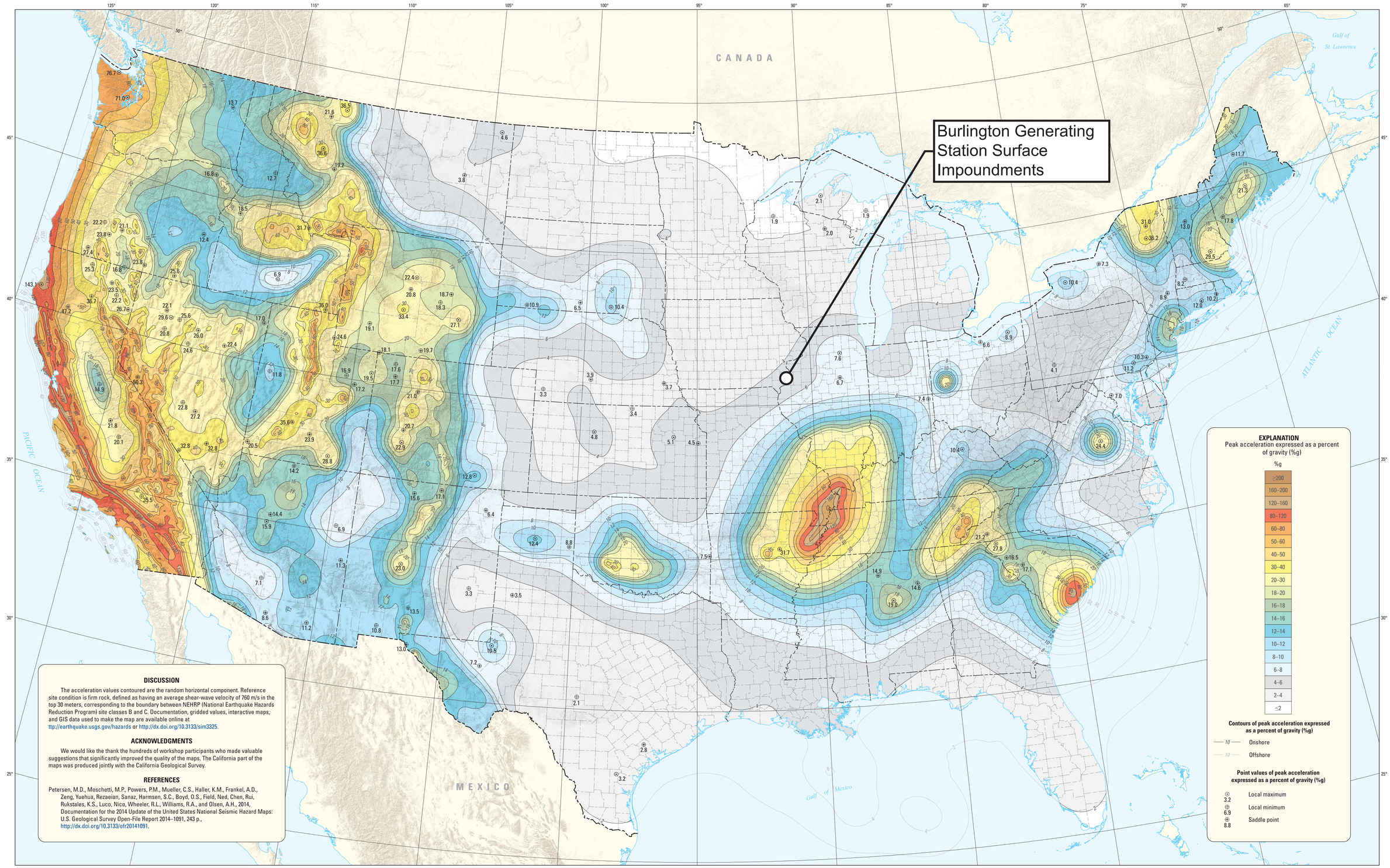
USGS | Esri, HERE, Garmin, FAO, NOAA, USGS, EPA |

Appendix C

Seismic Hazard Map

U.S. Department of the Interior
U.S. Geological Survey

Scientific Investigations Map 3325
Sheet 2 of 6



DISCUSSION

The acceleration values contoured are the random horizontal component. Reference site condition is firm rock, defined as having an average shear-wave velocity of 760 m/s in the top 30 meters, corresponding to the boundary between NEHRP (National Earthquake Hazards Reduction Program) site classes B and C. Documentation, gridded values, interactive maps, and GIS data used to make the map are available online at ttp://earthquake.usgs.gov/hazards or http://dx.doi.org/10.3133/sim3325.

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Petersen, M.D., Moschetti, M.P, Powers, P.M., Mueller, C.S., Haller, K.M., Frankel, A.D., Zeng, Yuehua, Rezaeian, Sanaz, Harmsen, S.C., Boyd, O.S., Field, Ned, Chen, Rui, Rukstales, K.S., Luco, Nico, Wheeler, R.L., Williams, R.A., and Olsen, A.H., 2014, Documentation for the 2014 Update of the United States National Seismic Hazard Maps: U.S. Geological Survey Open-File Report 2014–1091, 243 p., http://dx.doi.org/10.3133/ofr20141091.

SCALE 1:7 000 000

100 0 100 200 300 400 500 600 700 800 900 1000 MILES

100 0 100 200 300 400 500 600 700 800 900 1000 KILOMETERS

Shaded relief base from Esri Inc., 2008, Data and Maps
All other base map data from Esri Inc., 1993, Digital Chart of the World
United States County base map from the U.S. Geological Survey National Atlas, available at http://nationalatlas.gov/

Projection: Albers equal-area conic
Standard parallels 29.5°N. and 45.5°N., central meridian 95°W

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http://geohazards.cr.usgs.gov/.

Seismic-Hazard Maps for the Conterminous United States, 2014

Peak Horizontal Acceleration with 2 Percent Probability of Exceedance in 50 Years

By

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