Indiana Department of Environmental Management
Office of Water Quality
Wetlands Section

Publication Date:
April 26, 2024

Closing Date:
May 17, 2024

PUBLIC NOTICE

IDEM ID Number:
2023-1043-87-EJW-A

Corps of Engineers ID Number:
LRL-2023-365-JWS

To all interested parties:

This letter shall serve as a formal notice of the receipt of an application for **Section 401 Water Quality Certification** by the Indiana Department of Environmental Management (IDEM). The purpose of the notice is to inform the public of active applications submitted for water quality certification under Section 401 of the Clean Water Act (33 U.S.C. § 1341) and to solicit comments and information on any impacts to water quality related to the proposed project. IDEM will evaluate whether the project complies with Indiana's water quality standards as set forth at 327 IAC 2.

1. Applicant: Rachel Meeks
Alcoa Power Generating/Alcoa Fuels, Inc.
4700 Darlington Road
Newburgh, IN 47630

2. Agent: Tim Sandefur
Wetland Services, Inc.
3880 Trigg Turner Road
Corydon, KY 42406

3. Project location: The approximate central location of the project is 0.40 miles Southwest of Bateman Road and Wesley Road intersection in Warrick County.
Latitude: 38.101598 Longitude: -87.319605

4. Affected waterbody: 392 linear feet of intermittent Unnamed Tributary stream, 127 feet of ephemeral Unnamed Tributary stream, 2.41 acres of forested wetland, 4.81 acres of emergent wetland, 2.10 acres of unconsolidated bottom wetland, and 28.17 acres of open water will be impacted.

5. Project Description: Place fill material in federally jurisdictional wetlands and streams to recover coal from the Liberty A4 Coal Mine. Surface area mining impacts total 381 acres. The entire project area is composed of pre-law mine land. Wetlands and streams on site are incidental to previous mining operations. Mining operations between 1945-1950 and 1964-1984 left spoils susceptible to surface contamination. Current mining practices that will be implemented for this project include grading and capping spoil areas with compacted soil, which assists in contamination prevention. The active mining operation is projected to last approximately three to four years. Reclamation activities will occur over another one to two years. Surface mining operations will include complete removal and replacement of surface material, topography, drainage features, and other waterbodies. All discharged material will enter a sediment basin before leaving the site.

Mitigation will take place in the same watershed as the project impacts. Stream impacts will be mitigated for by enhancing 1,149 linear feet of Cattle Creek via riffle and pool complexes, creating 0.27 acres of forested wetland, enhancing 0.75 acres of forested wetland, restoring 2.62 acres of forested wetland, preserving 3.57 acres of forested wetland, restoring 0.43 acres of riparian buffer, and preserving 1.74 acres of riparian buffer. All mitigation performed in Cattle Creek will be preserved by a 10.25 acre conservation easement. Upstream and downstream of Cattle Creek, an additional 8,541 linear feet, or 2.87 acres, of stream and 46.63 acres of riparian buffer will be preserved.

Wetland impacts will be mitigated for by preserving 69.68 acres of forested wetland, preserving 10.16 acres of emergent wetland, and purchasing 1.022 acres of wetland credits from Coles Creek Mitigation Bank. Open water impacts will be mitigated for by creating 38.79 acres of open water via 2 final cuts at the location of project impacts and preserving 17.09 acres of open water at the Red Brush mitigation site. All wetland, stream, and riparian preservation areas are being preserved by conservation easements, which total 156.68 acres. Additional information may be found online at https://www.in.gov/idem/5474.htm

Comment period: Any person or entity who wishes to submit comments or information relevant to the aforementioned project may do so by the closing date noted above. Only comments or information related to water quality or potential impacts of the project on water quality can be considered by IDEM in the water quality certification review process.

Public Hearing: Any person may submit a written request that a public hearing be held to consider issues related to water quality in connection with the project detailed in this notice. The request for a hearing should be submitted within the comment period to be considered timely. The request should also state the reason for the public hearing as specifically as possible to assist IDEM in determining whether a public hearing is warranted.

Questions? Additional information may be obtained from Evan White, Project Manager, by phone at 317-671-6698 or by e-mail at evwhite@idem.in.gov. Please address all correspondence to the project manager and reference the IDEM project identification number listed on this notice. Indicate if you wish to receive a copy of IDEM's final decision. Written comments and inquiries may be forwarded to -

Indiana Department of Environmental Management
100 North Senate Avenue
MC65-42 WQS IGCN 1255
Indianapolis, Indiana 46204-2251 FAX: 317/232-8406

APPLICATION FOR AUTHORIZATION TO DISCHARGE DREDGED OR FILL MATERIAL TO ISOLATED WETLANDS AND/OR WATERS OF THE STATE

State Form 51821 (R2 / 11-15)

Indiana Department of Environmental Management

INSTRUCTIONS: 1. Read the instruction sheet before filling out this form.

2. You must complete all applicable sections of this form

1. Applicant Information	2. Agent Information
Name of Applicant Alcoa Power Generating/Alcoa Fuels, Inc.	Name of Agent Wetland Services, Inc.
Mailing address *(Street/ PO Box/ Rural Route, City, State, ZIP Code)* 4700 Darlington Road Newburgh, IN 47630	Mailing address *(Street/ PO Box/ Rural Route, City, State, ZIP Code)* 3880 Trigg Turner Rd Corydon, KY 42406
Daytime Telephone Number 812-480-6879	Daytime Telephone Number 270-860-8141
Fax Number	Fax Number
E-mail address *(optional)* rachel.wright@alcoa.com	E-mail address *(optional)* tsandefur@wetland.services
Contact person *(required)* Rachel Meeks	Contact person Tim Sandefur

3. Project / Tract Location			
County Warrick		Nearest city or town Boonville	
U.S.G.S. Quadrangle map name *(Topographic map)* Boonville, IN 1:24,000		Project street address *(if applicable)*	
Quarter	Section 4, 5, 8, 9	Township 5 S	Range 8W
Type of aquatic resource(s) to be impacted *(Attach Worksheet One.)* 519-linear feet of stream, 9.3-acres of wetland, and 40.5-acres of open water		Project name or title *(if applicable)* Liberty A4	
Other location descriptions or driving directions From Indianapolis, take I-69 South toward Evansville and take Exit 15 Boonville/New Harmony Rd. Turn left and head east on Boonville/New Harmony Rd. Continue on Boonville/New Harmony Rd for 9-miles and then turn left onto Bateman Rd. This is the southeast corner of the project area: 38.092069, -87.315128.			

4. Project Purpose and Description (*Use additional sheet(s) if required.*)	
Has any construction been started? ☐ Yes ☑ No	Anticipated start date *(month, day, year)* Fall 2023 or Winter 2024
If yes, how much work is completed?	
Purpose of project and overview of activities See attached.	

5. Avoidance, Minimization, and Mitigation Information: Applicants must answer all of the following questions
(*Use additional sheet(s) if necessary - provide a detailed response to all applicable questions.*)

A. For projects with Class II isolated wetlands –

1. Is there a reasonable alternative to the proposed activity?
   No

2. Is the proposed activity reasonably necessary or appropriate?
   Yes

B. For projects with Class III wetlands, adjacent wetlands, and/or streams, rivers, lakes or other water bodies –

1. Is there a practicable alternative to the proposed activity?
   No

2. Have practicable and appropriate steps to minimize impacts to water resources been taken?
   Yes

Describe all compensatory mitigation required for unavoidable impacts.
See attached.

6. Drawing / Plan Requirements *(Applicants must provide the following.)*

a. Top/aerial/overhead views of the project site showing existing conditions and proposed construction.
b. Cross sectional view of areas of fill or alterations to streams and other waters.
c. North arrow, scale, property boundaries.
d. Include wetland delineation boundary *(if applicable)*. Label all wetlands (jurisdictional, isolated and exempt) as I-1, I-2, I-3, etc. and the mitigation areas as M-1, M-2, etc.
e. Location of all surface waters, including wetlands, erosion control measures, existing and proposed structures, fill and excavation locations, disposal area for excavated material, including quantities, and wetland mitigation site *(if applicable)*.
f. Approximate water depths and bottom configurations *(if applicable)*.

7. Supplemental Application Materials *(Applicants must provide the following.)*

a. A wetland delineation of all wetlands on the project site *(for projects with wetland impacts)*.
b. At least three photographs of the project site. Indicate the photo locations on the project plans.
c. If isolated wetlands are present, a letter from the Corps of Engineers verifying this statement.
d. Wetland mitigation plan and monitoring report.
e. Classification of all isolated wetlands on the tract *(if isolated wetlands are present onsite)*.
f. Copies of all applicable local permits and/or resolutions pertaining to the project or tract.
g. Tract history *(see instructions)*.

8. Additional information that MAY be required *(IDEM will notify you if needed.)*

a. Erosion control and/or storm water management plans.
b. Sediment analysis.
c. Species surveys for fish, mussels, plants and threatened or endangered species.
d. Stream habitat assessment.
e. Any other information IDEM deems necessary to review the proposed project.

9. Permitting Requirements

a. Does this project require the issuance of a Department of the Army Section 404 Permit from the US Army Corps of Engineers? ☑ Yes ☐ No

If no, you do not need to answer Part b.

b. Have you applied for an Army Corps of Engineers Section 404 permit? ☑ Yes ☐ No

If yes, please supply the Corps of Engineers ID Number, the Corps of Engineers District, the project manager, and a copy of any correspondence with the Corps. **If no, contact** the Army Corps of Engineers regarding the possible need for a permit application.

c. Have you applied for, received, or been denied a permit from the Department of Natural Resources for this project? ☐ Yes ☑ No

Please give the permit name, permit number, and date of application, issuance or denial.

d. Have you applied for, received, or been denied any other federal, state, or local permits, variances, licenses, or certifications for this project? ☐ Yes ☑ No

Please give the permit name, agency from which it was obtained, permit number, and date of issuance or denial.

10. Adjoining Property Owners and Addresses

List the names and addresses of landowners adjacent to the property on which your project is located and the names and addresses of other persons (or entities) potentially affected by your project. Use additional sheet(s) if required.

Name Steven & Lana Pride Address *(number and street)* 6600 Schultz Rd City Elberfield	State IN	ZIP Code 47613	Name 1614 Sweetser LLC Address *(number and street)* PO Box 5542 City Evansville	State IN	ZIP Code 47716
Name Address *(number and street)* City	State	ZIP Code	Name Address *(number and street)* City	State	ZIP Code
Name Address *(number and street)* City	State	ZIP Code	Name Address *(number and street)* City	State	ZIP Code
Name Address *(number and street)* City	State	ZIP Code	Name Address *(number and street)* City	State	ZIP Code
Name Address *(number and street)* City	State	ZIP Code	Name Address *(number and street)* City	State	ZIP Code
Name Address *(number and street)* City	State	ZIP Code	Name Address *(number and street)* City	State	ZIP Code

11. Signature - Statement of Affirmation

I certify that I am familiar with the information contained in this application and, to the best of my knowledge and belief, such information is true and accurate. I certify that I have the authority to undertake and will undertake the activities as described in this application. I am aware that there are penalties for submitting false information. I understand that any changes in project design subsequent to IDEM's granting of authorization to discharge to a water of the state are not authorized and I may be subject to civil and criminal penalties for proceeding without proper authorization. I agree to allow representatives of the IDEM to enter and inspect the project site. I understand that the granting of other permits by local, state, or federal agencies does not release me from the requirement of obtaining the authorization requested herein before commencing the project.

Applicant's Signature: Rachel Meeks Date: 9-13-23 (mm/dd/yyyy)

Print Name: Rachel Meeks Title: Fuels Coordinator

Worksheet – Summary of Onsite Water Resources and Project Impacts

A. Jurisdictional Wetlands (Existing Conditions)		Jurisdictional Wetlands (Proposed Impacts)			
Wetland Type	**Size of wetland *(acreage)***	**To be Impacted?**	**Acreage**	**Fill quantity *(cys)***	**ATF**
☐ EM ☐ SS ☑ FO	2.41 (total acreage)	☑ Yes ☐ No	2.41		
☑ EM ☐ SS ☐ FO	4.81 (total acreage)	☑ Yes ☐ No	4.81		
☐ EM ☐ SS ☐ FO	2.1 (total acreage PUBG)	☑ Yes ☐ No	2.1		
☐ EM ☐ SS ☐ FO		☐ Yes ☐ No			
☐ EM ☐ SS ☐ FO		☐ Yes ☐ No			
☐ EM ☐ SS ☐ FO		☐ Yes ☐ No			
☐ EM ☐ SS ☐ FO		☐ Yes ☐ No			

Describe the type and composition of fill material to be placed in wetlands on the project site:
See attached.

Describe the type and composition and quantity *(cubic yards)* of material proposed to be dredged or excavated from wetlands on the project site:
See attached.

B. Isolated Wetlands (Existing Conditions)			Isolated Wetlands (Proposed Impacts)			
Wetland Class	**Type**	**Size of wetland *(acreage)***	**To be Impacted?**	**Acreage**	**Fill quantity *(cys)***	**ATF**
☐ 1 ☐ 2 ☐ 3	☐ NF ☐ F		☐ Yes ☐ No			
☐ 1 ☐ 2 ☐ 3	☐ NF ☐ F		☐ Yes ☐ No			
☐ 1 ☐ 2 ☐ 3	☐ NF ☐ F		☐ Yes ☐ No			
☐ 1 ☐ 2 ☐ 3	☐ NF ☐ F		☐ Yes ☐ No			
☐ 1 ☐ 2 ☐ 3	☐ NF ☐ F		☐ Yes ☐ No			
☐ 1 ☐ 2 ☐ 3	☐ NF ☐ F		☐ Yes ☐ No			

Describe the type and composition of fill material to be placed in isolated wetlands on the project site:
See attached.

Describe the type and composition and quantity *(cubic yards)* of material proposed to be dredged or excavated from isolated wetlands on the project site:
See attached.

C. Bridges and Stream Crossings - provide the following information for EACH structure (*Use additional sheet(s) if required.*)

Stream name
N/A

Description of impacts
N/A

Length of upstream bank impacts:
Left side: Right side:

Length of downstream bank impacts:
Left side: Right side:

Bank protection fill placed below the Ordinary High Water Mark:
Volume per running foot:

Bank protection fill placed below the Ordinary High Water Mark:
Area of coverage:

D. Bank Stabilization – provide the following information for EACH segment (*Use additional sheet(s) if required.*)

Water body name
N/A

Description of impacts
N/A

Length of shoreline or bank protection

Volume *(cubic yards)* of bank protection fill placed below the Ordinary High Water Mark per running foot

Area *(square feet)* of bank protection fill placed below the Ordinary High Water Mark

E. Stream Relocation

Water body name
392-ft intermittent; 127-ft ephemeral to be filled

Description of impacts
Please see Proposed Action in PAA

Length of existing channel to be relocated *(linear feet)*

Length of new channel to be constructed *(linear feet)*
1,272-ft offsite

Existing channel to be backfilled? ☐ Yes ☐ No

Type of relocation ☐ Piping ☐ Open ☐ Channel ☐ Other: Surface Mining

Type of fill and volume *(cubic yards)*
See attached.

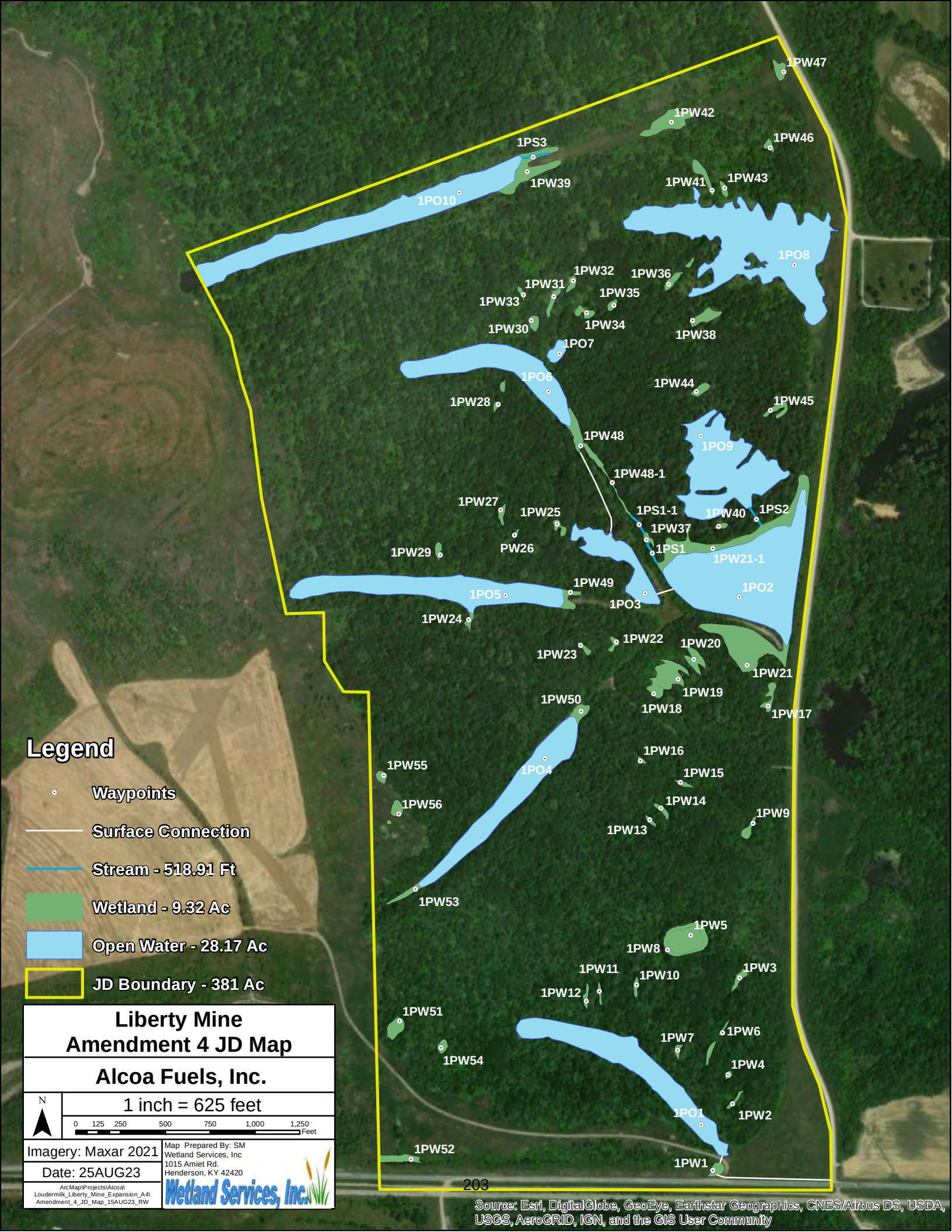
F. Open Water Fill

Water body name
1PO1,1PO2,1PO3,1PO4,1PO5,1PO6,1PO7,1PO8,1PO9,1PO10

Description of impacts
See attached.

Area of water body to be filled *(acres)*
40.5

Type of fill and volume *(cubic yards)*
See attached.



Legend

- Waypoints
- Surface Connection
- Stream - 518.91 Ft
- Wetland - 9.32 Ac
- Open Water - 28.17 Ac
- JD Boundary - 381 Ac

Liberty Mine Amendment 4 JD Map

Alcoa Fuels, Inc.

N

1 inch = 625 feet

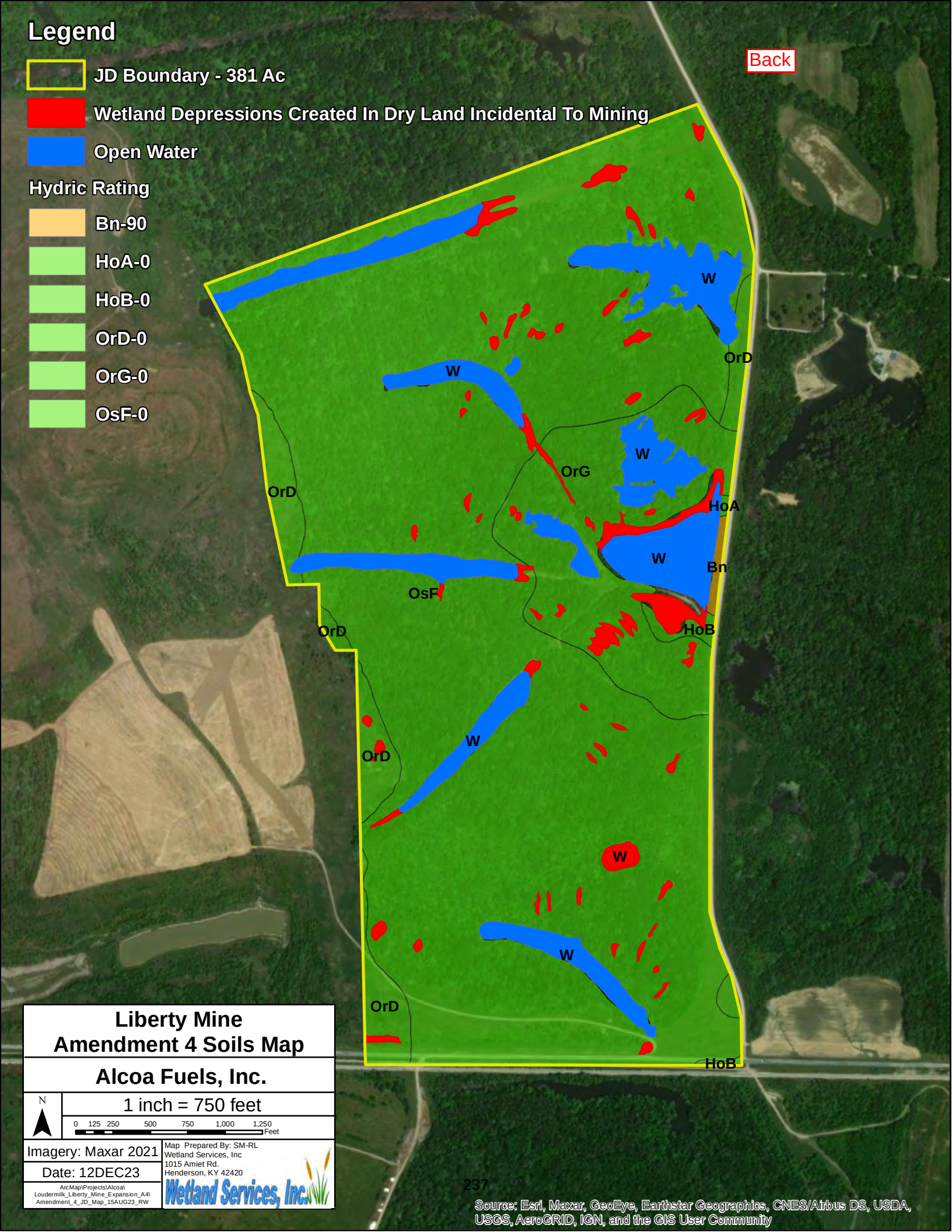
0 125 250 500 750 1,000 1,250 Feet

Imagery: Maxar 2021

Date: 25AUG23

ArcMap\Projects\Alcoa\Loudermilk_Liberty_Mine_Expansion_A4\Amendment_4_JD_Map_15AUG23_RW

Map Prepared By: SM
Wetland Services, Inc
1015 Amiet Rd.
Henderson, KY 42420
Wetland Services, Inc.


Legend
JD Boundary - 381 Ac
Wetland Depressions Created In Dry Land Incidental To Mining
Open Water
Hydric Rating
Bn-90
HoA-0
HoB-0
OrD-0
OrG-0
OsF-0
Back
W
OrD
W
W
OrG
OrD
HoA
W
Bn
OsF
OrD
HoB
W
OrD
W
OrD
HoB
Liberty Mine
Amendment 4 Soils Map
Alcoa Fuels, Inc.
N
1 inch = 750 feet
0 125 250 500 750 1,000 1,250
Feet
Imagery: Maxar 2021
Date: 12DEC23
ArcMap\Projects\Alcoa\
Loudermilk_Liberty_Mine_Expansion_A4\
Amendment_4_JD_Map_15AUG23_RW
Map Prepared By: SM-RL
Wetland Services, Inc
1015 Amiet Rd.
Henderson, KY 42420
Wetland Services, Inc.
237
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Liberty A4 Mine Geology Hole #: L-13-7		
Strata	**Depth - Feet**	**Net Neutralization Potential Ton CaCO3/T Ton**
Spoil	0-5	15.2
Spoil	5-10	0.0
Spoil	10-15	21.4
Spoil	15-20	29.6
Spoil	20-25	15.2
Spoil	25-30	29.7
Spoil	30-35	27.0
Spoil	35-40	25.2
Spoil	40-45	23.9
Spoil	45-50	20.2
Spoil	50-55	25.8
Spoil	55-60	23.9
Spoil	60-65	22.6
Spoil	65-70	27.1
Spoil	70-75	25.8
Spoil	75-80	27.6
Spoil	80-85	30.1
Spoil	85-90	472.4
Claystone	90-94	238.3
Limey Sandy Claystone	94.0-95.8	242.7
Limey Claystone	95.8-96.6	429.6
Sandy Claystone	96.6-98.6	238.9
Claystone	98.6-99.0	65.5
Shale	99.0-99.6	17.6
Claystone	99.6-100.5	18.9
Limestone	100.5-102.5	291.2
Limey Shale	102.5-103.8	47.7
Black Shale	103.8-104.1	45.2
Shale	104.1-105.5	12.6
Sandy Claystone	105.5-106.8	37.7
Sandstone	106.8-109.4	17.6
Sandy Shale	109.4-111.5	10.0
Sandy Shale	111.5-113.6	2.5
Sandstone	113.6-119.5	53.9
Sandstone	119.5-124.5	3.8
Sandstone	124.5-129.5	52.7
Sandstone	129.5-131.5	54.0
Sandstone	131.5-135.4	95.4
Sandstone	135.4-139.3	35.1

Liberty A4 Mine Geology Hole #: L-13-7 Cont.		
Strata	**Depth - Feet**	**Net Neutralization Potential Ton CaCO3/T Ton**
Sandstone	139.3-144.3	3.8
Sandstone	144.3-149.3	2.5
Sandstone	149.3-154.3	6.3
Sandstone	154.3-159.3	5.0
Sandstone	159.3-159.9	3.8
Sandstone	159.9-160.4	3.8
Limestone	160.4-160.8	235.7
Shale	160.8-161.3	56.5
Sandy Shale	161.3-162.4	40.1
Sandstone	162.4-165.1	30.1
Sandy Shale	165.1-167.45	18.2
Sandy Shale	167.45-169.8	23.8
Sandy Shale	169.8-172.1	16.3
Sandy Shale	172.1-174.4	33.3
Shale	174.4-175.8	23.2
Sandy Shale	175.8-176.4	55.2
Shaley Limestone	176.4-177.5	57.8
Shale	177.5-179.3	57.8
Shale	179.3-181.8	46.5
Shale	181.8-184.3	44.2
Shale	184.3-186.8	35.4
Shale	186.8-187.4	54.2
Limey Sandy Shale	187.4-188.0	47.3
Black Shale	188.0-190.3	37.2
Black Shale	190.3-191.9	44.6
Coal	191.9-199.2	-
Bone	199.2-199.4	0.0
Claystone	199.4-199.7	3.1
Sandy Claystone	199.7-200.6	2.5
Sandstone	200.6-202.4	2.5
Limey Sandy Shale	202.4-204.8	41.5
Limey Sandy Shale	204.8-207.2	36.4

CONCLUSION: The information contained in this section is an assimilation of pertinent material developed in the SMCRA permit application. The table above illustrates that site geology has a positive neutralization potential more than sufficient to bury or dilute acid bearing overburden. In contingency, should toxic material exist that was not detected during core sampling, the applicant has also established a toxic materials handling plan.

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CUMULATIVE IMPACTS ANALYSIS

Introduction and Location: The previous operations by Liberty occurred in the Squaw Creek/Pigeon Creek 8-digit watershed. LA4 is the first increment of the Liberty Complex that crosses over the eastern watershed divide into the Cypress Creek 12-digit HUC (051402011101) watershed. This document discusses the cumulative effects that previous mining operations have had on Cypress Creek, as well as the effects associated with the proposed operation.

Definitions: Impacts refer to the modification of an environmental resource by an outside action. Impacts may be beneficial or detrimental depending on the current existing condition and targeted future conditions of the project. The extent of an impact can be spatial and/or temporal. The degree of the impact can be major, minor, or negligible.

Cumulative Impacts: Two or more individual effects which, when considered together, are considerable and increase other environmental implications.

Short-term Impacts: Impacts that generally do not affect a site beyond completion of the project, i.e. site preparation, mining, and reclamation.

Long-term Impacts: These impacts generally are the affects that extend into future conditions after project completion.

Coal Mining: Over one-half (55%) of the watershed has been impacted by mining. The majority has been surface mining 46.0%. The remaining 9% was underground mining (See HUC Coal Mine Map). The earliest mining impacts to the watershed occurred in 1928 and the most recent mining ceased in 2013 (IGS, 2010).

Prior to implementation of SMCRA regulations beginning in 1977, the CWA, and the 2008 Mitigation Rule, we can presume that both wetlands and streams were impacted as a result of limited or no regulation. There have been a total of 85 years of mining in the watershed. Of those 85 years, 36 years have been under regulation.

We can attempt to infer from existing conditions what affect past mining may have on WOUS. The only impairment to waters in this watershed according to the 303d list of impaired waters is E.coli. E.coli impairments are indicative of livestock or human waste that have contaminated waterways and do not pertain to impairments that might occur as a result of coal mining.

Based on our research, there are no formal studies specific to this watershed that quantify or qualify impacts to wetlands and streams as a result of past mining practices. According to IDEM however, before settlement 200 years ago, there were approximately 5.6 million acres of wetlands in Indiana. Today they estimate 813,000 acres of wetlands remain in the state. In 200 years, that equates to approximately 85% wetland loss. The loss can be attributed to land use changes as a result of settlement. So we can infer that past coal mining would have contributed to some loss of wetlands in this watershed. Like IDEM, we used hydric soils maps to try and estimate how much wetland loss in the watershed might be attributed to past mining impacts.

According to USDA, there are 5,295-ac with a hydric rating within the watershed (see Hydric Soils Map). This constitutes 28.3% of the total watershed. 768-ac (14.5%) are 100% hydric, 1,355-ac (25.5%) are 90% hydric, and the remaining 3,172-ac (60%) have a hydric rating between 2-5%. Of the 5,295-ac with a hydric rating, 845-ac (16%) overlap with surface mining (see Hydric Soils, Surface Mines Overlap Map). That's 4.5% of the total watershed. However, of the 845-ac, 592-ac (70%) also overlap with agriculture, pasture, or hay land use (see Land Use, Surface Mines Overlap Map). Thus, the initial impacts to wetlands were most likely a result of agriculture type land use conversions before they were mined. 107-ac (12.8%) that overlap have a developed land use which indicates any impacts were first caused by developmental land use conversion (see Land Use, Surface Mines Overlap Map). Three of these total acres are classified as open water. That leaves 143-ac of impacts that may be attributable to coal mining alone.

We next multiplied the hydric soil rating percentages by total acres per soils type (see Total Acres Hydric Soils Impacted by Surface Mining Land Use Only). For example, Bonnie Soils have a 90% hydric rating and there were 59.2-ac of Bonnie Soils: 59.2 X 0.90 = 53.28-ac. This process was applied to every soil type of the 143-ac in order to estimate actual wetland acreage. This totaled 57.41-ac which equates to 0.003% of the entire watershed. Lastly, of the 381-acre LA4 Mine site, only 1-ac (0.002%) has a hydric rating (see Liberty Mine Amendment 4 Soils Map).

We also analyzed historic surface mining impacts and streams in the watershed again utilizing GIS. We used the National Hydrography Dataset (NHD) from USGS for our stream data. NHD represents the water drainage network of the United States with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and stream gages. We overlayed historic surface mining with the NHD layer. Historic surface mining was broken out before and after the Surface Mining Control and Reclamation Act (SMCRA) of 1977 to represent the introduction of a regulatory body overseeing surface mining operations. The results may be viewed on the NHD Streams and Surface Mining Map attached.

According to this, there is a total overlap of 32.6% of total NHD streams with surface mining. Again, we can presume that streams were affected as a result of mining, however it is difficult to estimate just how far reaching the effects were. Utilizing the available information, as stated previously, the only current impairment to streams in the watershed is E.coli which is not indicative of a mining related cause. So despite what appears to be a significant historic overlap of streams and mining in this watershed, degraded water quality as a direct result of mining cannot be concluded. Ag and development type impacts appear to have the greatest effect. Details for how these land uses affect water quality are outlined further below.

Current Regulatory Assurances: Liberty Mine, LLC. is required to be permit compliant with Section 401 Water Quality Certification with IDEM under Indiana Administrative Code (327 IAC 6.1-2-61) with respect to waters of the state.

Liberty Mine, LLC. is also required to be permit compliant with the requirements in 327 IAC 15-7 through the Indiana Department of Environmental Management which is issued as a NPDES General Permit. Rule 7, Section 1 states, "The purpose of this rule is to regulate wastewater

discharges for surface mining, underground mining, and reclamation projects which utilize sedimentation basin treatment for pit dewatering and surface run-off and to require best management practices for storm water run-off so that the public health, existing water uses, and aquatic biota are protected."

Liberty Mine, LLC. is also required to be permit compliant with Section 404 Discharge of dredged or fill material into waters of the U.S.

Contribution to Economy: Coal has been mined in Indiana since the early 1800's. According to the Energy Information Administration (EIA), Indiana annually is among the top ten coal producing states in the nation averaging 32M to 35M tons per year (IGS, 2010).

In 2007, F.T. Sparrow and Associates from West Lafayette, IN did a study to measure the contribution of coal to Indiana's economy. They examined both direct and indirect contributions. Directly, Indiana's coal mining industry employed 2,968 people at 44 mines in 9 southwestern Indiana counties. 34.23M tons of coal was mined and valued at $985 million. This represents 0.1% of state employment, and 0.47% of state GDP, about 1% of southwest regional employment. Indirectly, they used a multiplier that measures the full spending impact of each direct effect dollar as workers and owners locally spend their earnings. The value of the regional multiplier for coal mining in Indiana is currently 2.2; therefore the full impact of coal mining on Indiana's economy is $2.16 billion, not $985 million. Coupling that with Indiana's low electricity cost impact range, they summarized that coal production in Indiana translates somewhere between 2.3-4.9% of Indiana's Gross Domestic Product (Sparrow, 2008).

Coal Production: There are currently no active mining permits in the watershed today. The proposed project would be a continuation of the Liberty mine. Production has been recorded at this mine since 2013. The table below shows production between 2013 and 2019.

COAL PRODUCTION (Tonnage)

Year	Liberty Mine (surface)
2019	453,925
2018	1,627,647
2017	1,342,791
2016	1,114,777
2015	1,411,035
2014	1,473,314
2013	775,857

(Indiana Coal Council Website Accessed 8/2023)

Reclamation Efforts: In service since 1982, the Abandoned Mine Lands (AML) Program Reclamation Division Department of Natural Resources has been responsible for the restoration of many acres of hazardous and unproductive land. The Federal Surface Mining Control and Reclamation Act provided for the collection of coal taxes to pay for the reclamation of problems left behind from old coal mining practices. The Division of

Reclamation, AML program, has used these funds to eliminate the safety issues of dangerous mine openings, subsidences, highwalls, mining related abandoned structures, trash, and environmentally harmful coal processing waste. Numerous streams and water bodies have been improved and thousands of acres of trees have been planted to stabilize and enhance the environment. Since the inception of the program through July 2009, over $107 million of AML reclamation on 941 sites in Indiana. In Warrick County, more than $24 million has been spent on 154 sites (Indiana AML, 2009).

Liberty A4 Mine Site: Below we have summarized the characteristics of the Liberty A4 site. We have summarized how past, present, and reasonably foreseeable future activities may impact the overall watershed.

Past Activities: According to aerial imagery and other forms of information, approximately 100% of the 381-acre site was surface mined between 1945 and 1984. Mining and reclamation during this time frame was held to different standards. Prelaw spoil hills left the site unusable except for recreational purposes such has hunting and fishing.

Present Activities: Over 99% percent of this location still consist of prelaw spoil hills. The remaining areas consist of field pasture which gets baled on occasion. Prelaw mining reclamation practices has resulted in the water quality on site to be poor.

Wetlands: There are a total of 57 wetlands onsite, majority of which are forested. The largest wetland is 1.33-acres, while most are less than a quarter acre. There is a mixture of hard and soft mast species, however soft mast makes up the majority with species such as maple, cottonwood, sugarberry, ash, and elm. The most common oak species found in these wetlands is pin oak. There was minimal amount of herbaceous vegetation at the time but remnants of Japanese chaff flower, false nettle, and common woodland grasses were the most dominant throughout. For more specific details on wetlands, see the JD Report.

Streams: There are 4 streams onsite. The majority of channel length within the project boundary were classified as either Rosgen A, B, or E channels meaning they are moderately entrenched to entrenched. The average RPB score across all streams was ~92 which is qualitatively marginal. For more specific details on streams, see the JD Report.

Future Activities: Post mining land use shows these locations being returned to approximate original contour and land use when mining and reclamation has been completed.

Site Specific Conditions: The entire area proposed for mining by LA4 is Prelaw mined land; Mined prior to any of the SMCRA regulations initiated in 1977. This landuse is notorious for producing acid mine drainage, and this site is no exception.

The waters on this site are remnant features incidental to previous mining, and of indisputably low-quality as compared to the native wetlands in this region. These were deemed jurisdictional because the applicant conceded to such during the period of time when the Sackett decision stayed AJD's. Time is of the essence for Alcoa, and they conceded to a PJD solely for the purpose

of expediting the permit. Today guidance is in place such that an AJD could be requested that would remove substantial portions of these features from jurisdiction. Time remains of the essence, and the applicant continues to offer the mitigation as proposed. However, any significant mandatory increases in mitigation may result in reversion to an AJD, and a significant reduction of the mitigation outcome.

The main stem of Cypress Creek and several tributaries on the 303d list of impaired streams (See 303d Streams Map; IDEM, 2018). The impairment is caused by E.coli. There is no mention of metals or conductivity caused by mining, however we routinely sample in this watershed and find conductivities exceeding 2000µs/cm.

Headwaters Cypress Creek Watershed: The general description for this watershed has been extracted from the Lower Ohio-Little Pigeon Watershed Restoration Action Strategy (WRAS) as prepared for the Indiana Department of Environmental Management Office of Water Management in Spring 2002 by Wittman Hydro Planning Associates, Inc., and is referenced accordingly. The Headwaters Cypress Creek Watershed is a sub-watershed of the Lower Ohio-Little Pigeon 8-digit hydrologic unit code (HUC) watershed, however much of the information found in the WRAS is relevant and applicable to it as well.

Anthropogenic Watershed Impacts: All land use activities, including agriculture, landfills, coal mines, logging, gas and oil production, concentrated animal feeding operations, and urban sprawl, affect water quality. The predominant land use activities within a watershed are good indicators of the potential contaminant sources within that watershed (KDOW, 2001).

Overview: The Headwaters Cypress Creek Watershed is a twelve-digit (051402011101) HUC watershed located in southwestern Indiana (see HUC Map). The watershed encompasses approximately 18,676 acres in Warrick County. The Cypress Creek Watershed has been extensively impacted by logging, agriculture, and mining. Development type impacts also exist in the watershed and include residential and transportation. Forest makes up 33% of the watershed while the majority 48% is agricultural. Most of the soil in the watershed have medium to high erosion potential.

Land Cover: The following is a summary of vegetative cover in the watershed determined from Arc GIS (USDA, 2001):

Agriculture (Row Crop and Pasture): 48%
Developed: 13%
Open Water: 2%
Forest: 33%
Natural Grassland: 3%
Wetlands:1%

Population: The 2010 total population in the watershed was 16,139 (Census 2010). This number is approximate because some of the total extends partially beyond the watershed break. The densest area of population is in Boonville.

Agriculture: Nearly half (48%) of the watershed is covered by agriculture as described in the land cover section above.

Livestock: Livestock production within a watershed can encompass several species. Some animals are raised in open lots or pastures and some are raised in confined feeding lots or buildings. Confined feeding is the raising of animals for food, fur or recreation in lots, pens, ponds, sheds or buildings, where they are confined, fed and maintained for at least 45 days during any year, and where there is no ground cover or vegetation present over at least half of the animals' confinement area. Livestock markets and sale barns are generally excluded (IDEM 1999a). Indiana law defines a confined feeding operation (CAFO) as any livestock operation engaged in the confined feeding of at least 300 cattle, or 600 swine or sheep, or 30,000 fowl, such as chickens, ducks and other poultry. The IDEM regulates these confined feeding operations, as well as smaller livestock operations which have violated water pollution rules or laws, under IC 13-18-10. There are no CAFOs in the watershed.

Crop Production: Corn and soybeans are the primary crops produced. Alfalfa or hay production takes place in some localized areas.

Water Quality: As stated previously, Cypress Creek is 303d listed due to E.coli. This operation will not discharge any E.coli. The area proposed for mining does, however, currently discharge water with a high conductivity reading of 2,840 µs/cm. This discharge is orange with an oily sheen that originates from prelaw spoils. The applicant proposes to re-mine & reclaim this problematic area in a manner that will very likely improve these discharges. Within the industry this procedure is known as "mining-to-reclaim", and is a technique commonly used to reclaim abandoned mine lands.

Best available material (BAM) will be used to reclaim the surface. BAM is a weakly lithified layer of inert material encountered during the deeper remine, which weathers quickly into soil when exposed to the elements & tillage. All surface runoff from this operation will, as required by SMCRA regulation, report to a sediment basin. All future discharge from these basins must meet approved NPDES standards. This permit is issued by IDEM under 327 IAC 15-7, Rule 7, Section 1 states, “The purpose of this rule is to regulate wastewater discharges for surface mining, underground mining and reclamation projects which utilize sedimentation basin treatment for pit dewatering and surface run-off, and to require best management practices for storm water run-off so that the public health, existing water uses, and aquatic biota are protected.”

This water quality remediation will come to the Waters of the U.S. as a free byproduct of the proposed reclamation. It certainly is not expected to further degrade water quality in Cypress Creek, and may very well yield an improvement.

Flooding: Changes in flooding are expected to be neutral. Prelaw spoil is loose and good at soaking up water. The permanent basins left by this operation will continue to capture runoff and attenuate flash rates in the same general manner as the prelaw features do today.

Flow Rate: The flow rate will likely be reduced by this operation. However, with the current flow being heavily contaminated, this can be interpreted as a benefit.

Habitat: The mine will result in a temporal loss of both riparian and wetland forested habitat until the forested post mining landuse is re-established. This loss is factored into the proposed mitigation ratios.

Mitigation Impacts: No onsite mitigation is proposed primarily because this site sits high in the landscape without suitable watershed to support high-quality mitigation, the topsoil has been long-since lost by previous operations, and is heavily infested with non-native propagules.

The proposed mitigation is located at the southern end of the main impaired reach of Cypress Creek. This PRM location will, amongst other benefits, end direct bovine access & manure discharge into one of Cypress Creeks tributaries, thereby reducing the amount of E.coli currently being discharged into it. Because the water quality leaving the site is so bad currently, it is easy to conclude that this “mine-to-reclaim” operation will improve water quality in some manner.

Cumulative effects are the combination of impacts & benefits resulting from past, present & foreseeable future land use. Given the benefits of mining-to-reclaim on the impact site, coupled with the benefits of the offsite mitigation that will remove E.coli from an E.coli impaired reach, we believe that the net cumulative effect is positive.

Point & Non-Point Sources: A number of substances including nutrients, bacteria, oxygen-demanding wastes, metals, and toxic substances cause water pollution. Sources of these pollution-causing substances are divided into two broad categories: point source and nonpoint source. Point sources are typically piped discharges from wastewater treatment plants, large urban and industrial storm water systems, and other facilities. Nonpoint sources can include atmospheric deposition, groundwater inputs, and runoff from urban areas, agricultural lands, and others.

Point Sources: Point sources refer to discharges that enter surface waters through a pipe, ditch or other well-defined point of discharge. The term applies to wastewater and stormwater discharges from a variety of sources. Wastewater point source discharges include municipal (city and county) and industrial wastewater treatment plants and small domestic wastewater treatment systems that may serve schools, commercial offices, residential subdivisions, and individual homes. Stormwater point source discharges include stormwater collection systems for medium and large municipalities which serve populations greater than 100,000 and stormwater discharges associated with industrial activity as defined in the Code of Federal Regulations (40 CFR 122.26(a)(14)). The primary pollutants associated with point source discharges are oxygen-demanding wastes, nutrients, sediment, color, and toxic substances including chlorine, ammonia, and metals.

Point source dischargers in Indiana must apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit from the state. Discharge permits are issued under the NPDES program, which is delegated to Indiana by the US Environmental

Protection Agency (EPA) (Wittman, 2002). There are 15 NPDES facilities and 22 active permit outfalls in the watershed (see NPDES Map attached). They are for the Boonville Municipal Water Township, Liberty Mine, and Dynatech Headers Co.

A point source covered by NPDES permits is combined sewer overflows (CSO). A combined sewer system is a wastewater collection system that conveys sanitary wastewater (domestic, commercial and industrial wastewater) and stormwater through a single pipe system to a Publicly Owned Treatment Works. A CSO is the discharge from a combined sewer system at a point prior to the Publicly Owned Treatment Works. CSOs are point sources subject to NPDES permit requirements including both technology-based and water quality-based requirements of the Clean Water Act.

In addition to the NPDES permitted dischargers in the watershed, there may be many unpermitted, illegal discharges to the Headwaters Cypress Creek Watershed system. Illegal discharges of residential wastewater (septic tank effluent) to streams and ditches from straight pipe discharges and old inadequate systems are a problem within the watershed (Wittman, 2002).

Nonpoint Sources: Nonpoint source pollution refers to runoff that enters surface waters through stormwater runoff, contaminated ground water, snowmelt, or atmospheric deposition. There are many types of land use activities that can serve as sources of nonpoint source pollution including land development, construction, mining operations, crop production, animal feeding lots, timber harvesting, failing septic systems, landfills, roads, and paved areas. Stormwater from large urban areas (greater than 100,000 people) and from certain industrial and construction sites is technically considered a point source since NPDES permits are required for discharges of stormwater from these areas.

Sediment and nutrients are major pollution-causing substances associated with nonpoint source pollution. Others include *E. coli* bacteria, heavy metals, pesticides, oil, and grease, and any other substance that may be washed off the ground or removed from the atmosphere and carried into surface waters. Unlike point source pollution, nonpoint pollution sources are diffuse in nature and occur at random time intervals depending on rainfall events. Below is a brief description of major areas of nonpoint sources of pollution in the watershed (Wittman, 2002).

Agriculture: There are a number of activities associated with agriculture that can serve as potential sources of water pollution. Land clearing and tilling make soil susceptible to erosion, which can then cause stream sedimentation. Pesticides and fertilizers (including synthetic fertilizers and animal wastes) can be washed from fields or improperly designed storage or disposal sites. Construction of drainage ditches on poorly drained soils enhances the movement of oxygen consuming wastes, sediment and soluble nutrients into groundwater and surface waters. Concentrated animal operations can be a significant source of nutrients, biochemical oxygen demand and E. coli bacteria if wastes are not properly managed. Impacts can result from over-

application of waste to fields, from leaking lagoons, and from flows of lagoon liquids to surface waters due to improper waste lagoon management. Also there are potential concerns associated with nitrate nitrogen movement through the soil from poorly constructed lagoons and from wastes applied to the soil surface. Grassed waterways, conservation tillage, and no-till practices are several common practices used by many farmers to minimize soil loss. Maintaining a vegetated buffer between fields and streams is another excellent way to minimize sediment and nutrient loads to streams (Wittman, 2002).

Urban/Residential: Runoff from urbanized areas, as a rule, is more localized and can often be more severe in magnitude than agricultural runoff. Any type of land-disturbing activity such as clearing or excavation can result in soil loss and sedimentation. The rate and volume of runoff in urban areas is much greater due to the high concentration of impervious surface areas and storm drainage systems that rapidly transport stormwater to nearby surface waters. This increase in volume and rate of runoff can result in streambank erosion and sedimentation in surface waters.

Urban drainage systems, including curb and guttered roadways also allow urban pollutants to reach surface waters quickly with little or no filtering. Pollutants include lawn care pesticides and fertilizers, petroleum-based hydrocarbons, household wastes, road salts, heavy metals, and *E. coli* bacteria (from animals and failing septic systems). Household hazardous wastes have the potential to severely contaminate water if disposed of improperly. The diversity of these pollutants makes it very challenging to attribute water quality degradation to any one pollutant.

Replacement of natural vegetation with pavement and removal of buffers reduces the ability of the watershed to filter pollutants before they enter surface waters. The chronic introduction of these pollutants with increased flow and velocity often results in degraded waters. Many waters adjacent to urban areas are rated as biologically impaired. This degradation also exists in lakes, which have been heavily influenced by adjacent urban development (AISWCD, 2009).

The population figures discussed above are good indicators of where urban development and potential urban water quality impacts are likely to occur. Concentrated areas where urban development is high may lead to further water quality problems associated with the addition of impervious surfaces next to surface waters (Wittman, 2002).

Onsite Wastewater Disposal: Septic systems contain all of the wastewater from a household or business. A complete septic system consists of a septic tank and an absorption field to receive effluent from the septic tank. The septic tank removes some waste, but the soil absorption field provides further absorption and treatment. Septic systems can be a safe and effective method for treating wastewater if they are sized, sited, and maintained properly. However, if the tank or absorption fields malfunction or

are improperly placed, constructed or maintained, nearby wells and surface waters may become contaminated.

Some of the potential problems from malfunctioning septic systems include:

Polluted groundwater: Pollutants in septic effluent include bacteria, nutrients, toxic substances, and oxygen consuming wastes. Nearby wells can become contaminated by failing septic systems.

Polluted surface water: Groundwater often carries the pollutants mentioned above into surface waters, where they can cause serious harm to aquatic ecosystems. Leaking septic tanks can also leak into surface waters through or over the soil. In addition, some septic tanks may directly discharge to surface waters.

pH: Nutrient load contributions from septic systems to the environment may result in an increase in algae growth which will adversely affect pH levels. When algae growth occurs carbon dioxide is consumed, raising the pH in a waterbody. When algae respire, carbon dioxide is released, lowering a waterbodies pH (IEPA, 2008).

Risks to human health: Septic system malfunctions can endanger human health when they contaminate nearby wells, drinking water supplies, and fishing and swimming areas.

Pollutants associated with onsite wastewater disposal may also be discharged directly to surface waters through direct pipe connections between the septic system and surface waters (straight pipe discharge). However, 327 IAC 5-1-1.5 specifically states that "point source discharge of sewage treated or untreated, from a dwelling or its associated residential sewage disposal system, to the waters of the state is prohibited" (Wittman, 2002).

Construction: Construction activities that involve excavation, grading, or filling can result in significant erosion and consequently sedimentation in streams if not properly controlled. Sedimentation from developing urban areas can be a major source of pollution due to the cumulative number of acres disturbed in a watershed. Sedimentation leads to water quality impairment, loss of flood conveyance and storage, and degrades natural areas. Construction of single family homes in rural areas can also be a source of sedimentation when homes are placed in or near stream corridors. As a pollution source, construction activities are typically temporary, but the impacts on water quality can be severe and long-lasting. Construction activities tend to be concentrated in the more rapidly developing areas of a watershed (AISWCD, 2009).

Degraded Wetlands: Healthy wetlands and riparian areas perform valuable water quality-related functions by filtering water and trapping sediments and pollutants. The ability of wetland and riparian areas to remove NPS pollutants from surface water

runoff is determined by plant species composition, geochemistry, and hydrogeomorphic characteristics. Any changes to these characteristics can affect the filtering capacities of these areas. Activities such as channelization, which modify the hydrology of floodplain wetlands, can alter the ability of these areas to retain sediment when they are flooded and result in erosion and a net export of sediment from the wetland (Reinelt and Horner, 1990).

Management measures have been developed for the control of NPS pollution through the protection and restoration of wetlands and riparian areas and the use of vegetated treatment systems. Information on degraded wetlands as potential contributors to nonpoint source pollution and the management measures for NPS pollution abatement is available in the USEPA Draft Guidance entitled "National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution" (USEPA, 2001).

Resource Concerns: The success in restoring water quality in a watershed is fundamentally based on identifying the specific geographic problem areas; identifying all sources contributing to the impairment of the waterbody; and quantifying the contribution of a pollutant by each source (Wittman, 2002).

Failing Septic Systems and Straight Pipe Discharges: Local county health departments and other stakeholders have identified failing septic systems and straight pipe discharge from septic tanks as significant sources of water pollution. Straight pipe discharges from septic tanks and septic tanks connected to drainage tiles are illegal (Ill. Adm. Code Title 77, Chapter 1, Subchapter r, Part 905 Private Sewage Discharge Code); however, these practices still exist (IEPA, 2009).

Fish Consumption Advisories: In many cases, the source of the contamination is unknown and may be from atmospheric deposition or some unknown discharge. To address this concern, the cause or source must be identified. Until that is accomplished, the fish consumption advisories should be followed (Wittman, 2002).

Nonpoint Source Pollution: Nonpoint source pollution (NPS) contributions are often difficult to assess or quantify. They can include sediment deposition from soil erosion, nutrient runoff from animal wastes and commercial fertilizer, herbicide and insecticide runoff, and oil or fuel waste runoff. Degraded wetlands may also contribute to nonpoint source pollution, as their capacity for abatement of runoff and the associated pollutants is diminished or lost. Nonpoint pollution can emanate from agricultural as well as urban lands. Currently, loadings of nonpoint source pollutants to water are often inferred by examination of land use practices, without actual measurements. In addition, the actual water quality impairments related to nonpoint source pollutants have not been well characterized in the watershed. Finally, very few regulatory control mechanisms exist to control nonpoint source pollution (Wittman, 2002).

Point Sources: In addition to the active NPDES permitted dischargers in the watershed, there are likely illegal point source discharges, such as tiles discharging septic tank effluent.

The Permitting and Compliance Branch of the Office of Water Quality is responsible for issuing and monitoring compliance of NPDES permit holders. Clearly, more emphasis and resources are needed to identify and correct illegal point sources and noncomplying point sources. Improving compliance of NPDES dischargers and identifying illegal dischargers will involve fostering a working relationship with other local, state, and federal stakeholders to monitor compliance and report unusual discharges or stream appearance. In regards to illegal discharges, the Office of Water Quality will work with local, state, and federal stakeholders to identify and eliminate these sources of water pollution (Wittman, 2002).

Biological Conditions (mIBI)/(fIBI): Information on biological assessments conducted within the watershed is not available.

Conclusion: The negative impacts of this project are short-term in the temporal context and minor with respect to the degree of effect. The vegetation lost during the operation is predominantly non-target, and erosion is always controlled according to SMCRA standards. The positive impacts, specifically the mitigation, are more than adequate to result in no net loss. This project will contribute to the ongoing economic and energy security of the region and the nation. However, contrary to historic impacts, this project considers and will enhance the aquatic integrity of the watershed.

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COMPENSATORY MITIGATION PLAN (CMP)

INTRODUCTION: The purpose of this document is to develop compensatory mitigation for the stream and wetland impacts proposed by the Liberty A4 Mine. In order to compensate for impacts to jurisdictional Waters of the U.S. and the State of Indiana, Alcoa is committed to fulfilling the 12 site-specific CMP requirements of the 2008 Mitigation Rule proposed herein.

1 – BASELINE INFORMATION: This site is situated in the 12-Digit watershed 051402011101, the Headwaters Cypress Creek Watershed.

Project Activity: Surface mining & reclamation.

Impact & Mitigation Location: Directions to the impact site from the ACOE Newburgh Regional Field Office: Proceed right onto IN-66 E. Turn left onto IN-61 N and proceed 8.9 miles towards Boonville. Turn left onto IN-61/IN-61/E Main St, then turn right onto IN-61 N. Proceed 3.1 miles then turn left onto Boonville/New Harmony Road. Turn right onto Bateman Road and the site will be on the left. Center Coordinates: N 38.09984, W -87.32044

Directions to the mitigation site from the ACOE Newburgh Regional Field Office: Proceed right onto IN-66 E. Turn left onto Red Brush Rd. and immediately turn right. From this point you will drive through a series of gates. Once you get to the low water crossing your site will be on the left. N 37.94087, W -87.32044

Applicant Information: Alcoa Fuels, Inc, Rachel Meeks, 4700 Darlington Rd. Newburgh, In 47630. 812-480-6879. rachel.wright@alcoa.com

Agent Information: Wetland Services, 1015 Amiet Rd, Henderson, KY 42420 Contact Tim Sandefur 270-860-8141. tsandefur@wetland.services

Impacts to Jurisdictional Waters: Removal and replacement of surface materials to a depth of ~200'. Ancillary impacts include haul roads, stockpiles, diversions and temporary basins.

Existing Conditions of the Impact Site: The site is prelaw mine land at the top of the watershed. Hydrology inputs are limited primarily to precipitation and surface runoff. Water exits the site via laminar flow and unnamed tributaries, and reports to Cypress Creek.

2 – GOALS & OBJECTIVES: The goal of this CMP is to mitigate similar functions and values as those lost by the activity, and result in no net loss of functions. This is achieved by conducting the mitigation in the same watershed as the impacts. The mitigation streams are designed as stable habitat by means of well-vegetated riffle-pool morphology with a riparian buffer. A complete description of the geomorphic similarities between the impact and mitigation sites is included in section 4 – Site Selection. This plan compensates according to the calculations described in section 3 – Determination of Credits. Objectives include:

- Constructing and planting the mitigation site as proposed;
- Monitoring and maintaining the sites for the specified period;
- Timely implementation of adaptive management should any become necessary;
- Protecting the mitigation with the deed attached legal documents as proposed;
- Achieving the performance standards and release from further management, and;
- Implementing the long-term management plan for site protection.

3 & 4 – DETERMINATION OF CREDITS & SITE SELECTION: The impact waters are remnant features incidental to pre-law mining, and of indisputably low-quality as compared to reference. These were deemed jurisdictional because the applicant conceded as such during the period of time when the Sackett decision stayed AJD's. Time is of the essence for Alcoa, and they conceded to a PJD solely for the purpose of expediting the permit. Today guidance is in place such that an AJD could be requested that would remove substantial portions of these features from jurisdiction. Time remains of the essence, and Alcoa increased their mitigation proposal in response to comment. However, any additional significant mandatory increases in mitigation may result in reversion to an AJD, and a significant reduction to the mitigation outcome.

Stream Credits: The proposed mining impacts are to pre-law streams with an average ephemeral watershed size of 12-acres, intermittent size of 26-acres, and an overall average watershed size of 17-acres. Stream mitigation will be conducted at a 1:1 ratio on a perennial stream called Cattle Creek, with an 850-acre watershed. This site was selected because:

- It is in the same watershed as the impacts, and in need of restoration.
- It reports to Cypress Creek 303d listed due to e-coli, and this plan will reduce e-coli contamination; the watershed approach.
- It is much larger than the impact streams, and will not only ensure no net loss, but easily result in a net cumulative benefit to the watershed at the 1:1 ratio proposed.
- It joins existing mitigation which increases the contiguous size of restored aquatic habitat within the Cattle Creek watershed, and promotes watershed continuum.

Immediately upstream of this reach is stream & wetland including 4,020’ of stream restored on a floodplain developed as PFO wetland. 14-acres of hard mast riparian buffer surround the valley. The understory is native, diverse & robust. The stream flow regime has increased from intermittent to perennial due to overbank flooding and groundwater exchange. This is evidenced by the presence of fish, and aquatic mussels & snails that were not present prior to restoration, as well as observed continuous flow, and an obligate plant community on the bed, banks and portions of the floodplain. This proposed site joins the existing mitigation described above, and connects it to the downstream receiving water, Red Brush Creek. Red Brush Creek is proposed for 90-ac & 9,000’ of stream & wetland mitigation as part of a single-user bank to be developed by Alcoa. Developing mitigation in a manner that connects existing mitigation to future planned mitigation promotes the watershed continuum, and indicates the applicant has considered the reasonably foreseeable changes in landuse within the watershed, and has planned for those changes commensurate with the common goals of mitigation.

In the humid east, it is preferrable to focus impacts on ephemeral and otherwise lesser-value intermittent streams because it substantially reduces the adverse effects (1). It is then preferred to focus mitigation on large intermittent and perennial streams lying within main valleys. This concept is not intended to diminish the value of ephemeral streams, only to recognize that larger streams produce aquatic functions at a higher rate and more consistently than those with lesser flow regimes.

Open Water Credits: Open water will be mitigated back onsite in the form of a large final cut & two permanent basins on the mine. Additional open water will occur by preserving a 17.1-acre final cut at the Red Brush preservation site.

Wetland Credits: Alcoa proposes to provide wetland mitigation by means of restoration, creation, enhancement, preservation & bank credits purchase. Preservation consists of executing conservation easements on 156.7-acres at 5 existing mitigation sites.

Existing Waters See JD Map & Data Sheets for details			
Wetland Class	Acreage	Rosgen Channel Type	Linear Feet
PFO	2.41	A	114
PUBG	2.1	B	252
PEM	4.81	C	0
Total	**9.32-ac**	E	153
		Total	**519-ft**

Proposed Disturbances See Impact Map			
Wetlands	**Avoidance - 0**	**Minimization - 0**	**Impact**
		PFO	(2.41-ac) 19.787 EIU
		PEM	(4.81-ac) 31.542 EIU
		PUBG	(2.10-ac) 14.555 EIU
		Total	**(9.32-ac) 65.884 EIU**
Streams	**Avoidance - 0**	**Minimization - 0**	**Impact**
		Intermittent	392
		Ephemeral	127
		Total	**519-ft**

Wetland & Open Water Ratio Calculation			
Wetland EIU Required		**Open Waters Acreage Required & Location**	
PFO: 19.787 EIU x 3	59.361	Open Water – 40.5-ac	38.79-acres Onsite
PEM & PUBG: 46.097 EIU x 1.5	69.146	Offsite Preservation 17.1 X 0.1	1.71-acres Offsite
Total	**128.507 EIU**	**Total**	**40.5-ac**

HGM variables were used to quantify wetland function. The functional value of each wetland was calculated beginning with the sum total of its variables being the functional capacity index (FCI). The FCI of each wetland is multiplied by its size to calculate ecological integrity units (EIU). The total impact is 65.884 EIU. Mitigation ratios in the previous table were applied to the impact EIU, by Cowardin type, to calculate 128.507 EIU required for mitigation. The mitigation sites generate a base amount of 1,274.12 EIU. The ratios below were applied to these EIU, by mitigation type, to calculate 128.512 EIU proposed for mitigation, and confirm no net loss of wetland function.

PFO Wetland Mitigation 128.507 EIU Required						
Type	**Location**	**FCI**	**Acres**	**Initial EIU**	**Ratio**	**Final EIU**
PFO Restoration	Cattle Creek	16.873	2.62	44.207	1:1	44.207
PFO Creation	Cattle Creek	15.013	0.27	4.054	1:1	4.054
PFO Enhancement	Cattle Creek	15.438	0.75	11.579	1:5	2.316
PFO Preservation	Liberty A1-1	15.924	51.24	815.946	1:20	40.797
	Liberty A1-2	16.750	4.61	77.218	1:20	3.861
	Liberty A1-3	16.420	2.49	40.886	1:20	2.044
	Red Brush*	12.099	5.03	34.293	1:20	1.715
	Red Brush West*	14.453	16.47	195.107	1:20	9.755
	Cattle Creek	14.238	3.57	50.830	1:20	2.542
Bank Credit Purchase	Coles Creek	16.85	1.022 ac/credits			17.221
*PEM EIUs devalued by 50%				**Total Mitigation EIU**		**128.512**

Intermittent Stream Mitigation Required			
Required	**Offsite**	**Ratio 1:1**	**Intermittent Total**
392-ft Intermittent Stream	392-ft	392-ft X 1	**392-ft**
Ephemeral Stream Mitigation Required			
Riparian Buffer Type	**Linear Feet**	**Ratio**	**Ephemeral Total**
Predominately Forested	127-ft	0.75:1	95-ft
Partially Forested	0-ft	0.60:1	0-ft
Predominately Ag	0-ft	0.50:1	0-ft
			95-ft
		Total Stream	**487-ft**

Required Mitigation Summary							
Offsite PFO Restoration	**Offsite PFO Creation**	**Offsite PFO Enhancement**	**Offsite PFO Preservation**	**Offsite Intermittent Stream Restoration**	**Offsite Riparian Restoration**	**Onsite Open Water Creation**	**Offsite Open Water Preservation**
2.62-ac	0.27-ac	0.75-ac	83.38-ac	487’	0.43-ac	38.8-ac	17.1-ac
Final Amounts: Some of these quantities are calculated according to the design. Final measurements shall be determined by As-Built Survey. The final credits will be determined by delineation & the attainment of performance standards.							

The Liberty A1 permit LRL-2014-336 required onsite mitigation, which is in various stages of reclamation. The southern portion of the impact has since been avoided, and the final outcome of the onsite plan is currently undetermined. Preserving the LA1 offsite mitigation protects an amount of stream not related to the LA4 permit. The LA1 offsite plan built 871’ of stream more than was required by the approved plan. LA4 includes 662’ more than required by this permit. These amounts are illustrated in the table below, and are for use as contingency only at the Liberty A1 onsite plan.

Liberty A1 Onsite				
Location	**Amount**	**Type**	**Ratio**	**Feet**
Liberty A1-1 Restoration	871	Intermittent	1:1	871’
Liberty A1-1 Preservation	1,252	Intermittent	1:20	63’
Liberty A1-2 Preservation	2,572	Perennial	1:20	129’
Liberty A1-3 Preservation	1,446	Perennial	1:20	72’
Liberty A4 Restoration	662	Perennial	1:1	662’
	Intermittent Total	**934’**	**Perennial Total**	**863’**

3A Timing: Cattle Creek offsite mitigation will be completed according to the final terms of the approved permit. Permit issuance is expected in spring/early summer of 2024. Mitigation construction will be completed by the end of the 2024 growing season. Trees will be planted in the winter/spring of 2025, resulting in an initial temporal loss of ~0.8-yrs. Temporal loss is also based on the timing of all impacts. The life of mine impacts for the LA4 amendment area is 3-yrs while the mitigation will occur in ~0.8-yrs. As such, only a fraction of the impact waters will have temporal loss. Those impacted after the completion of Cattle Creek will result in a temporal gain of up to 2.2-yrs. In complying with the CFR, temporal loss has been factored into the proposed mitigation ratios. The PRM must be completed according to the timelines on the approved permit in order to remain in compliance.

5 – MITIGATION WORK PLAN:

Existing Conditions: This proposed land unit has been part of a high-density cattle operation dating back prior to the 1970's. Cattle impacts on this stream are evident and were continuous until sometime in the last 6-years when a partially-effective fence was installed to prevent direct stream access. This channel is fully entrenched existing as a Rosgen G-channel. This is partly due to cattle impacts on the bed & banks, as well as upstream watershed changes, and a substantial elevation change on the lower end as it makes confluence with the much deeper receiving water, Red Brush Creek. The bed has a run-type morphology that lacks riffle or pool habitat, the banks are steep & eroding, the bed substrate is unstable, and woody debris is continually swept out.

The riparian zone is closed canopy with a mix of hard & soft mast species, ~50% is PFO wetland. The understory within the upland portion of the forest is almost completely non-native & invasive Japanese Chaff Flower. The PFO portion is nicer with Impatiens, Drooping Wood Reed, but also microstegium. Soils along the north side of the stream are non-hydric as they rise sharply and undulate; mapped as Henshaw 3% hydric. Soils along the south side are predominantly hydric mapped as a combination of Birds 90%, & Wakeland 3%. The non-hydric soils are generally limited to a zone ~40' wide along the top of bank.

Restoration: Alcoa proposes to restore this reach with a combination of bankfull benches, newbury riffles, habitat riffles & toe-wood structures. Ideally, we would raise the invert of this entire reach with series of cascading newbury riffles, and forego the bankfull bench. However, stream mitigation on Liberty A1 resulted in the restored floodplain being at a low elevation. If we raise the invert now it will impound approximately 600' up the lower end of LA1. We will still raise the lower end of Cattle Creek with a series of newburys, but only until we reach a limiting elevation ~250' upstream into LA1. From this point upstream we will cut a bankfull bench. Both methods, Newbury riffles & bankfull bench, will provide floodplain access for Cattle Creek.

Newbury riffles are the preferred method because this approach returns the stream to its native floodplain, similar to Priority 1 restoration. The water table is restored to historic levels & the stream flow regime is enhanced. The hydrology of existing PFO wetlands adjacent to Cattle Creek will be enhanced. This approach will also reduce impacts to the in-tact riparian zone, and immediately stabilize the banks by impounding water up into the zone of undercut instability. This reduces the loss of trees falling off of undercut banks, and establishes deeper pools for aquatic refugia. Over time, alluvial deposition & sorting aggrades sediments which further stabilizes the banks.

Low slope thru the upper reach will be offset with the use of habitat riffles. These riffles induce very little elevation change, but the rock substrate being shallow to the surface speeds the water so that it flows with a broken surface, and provides riffle habitat throughout a reach that would otherwise be a single long pool. A bankfull bench will be cut along the north side of the channel. The north side was selected for several reasons; the riparian zone is narrower on this side, the stream is impinged up against the higher topography on the north side, and eliminates impacts to the PFO on the south side. Rootwads salvaged during this operation will be to construct toe wood structures on the eroded outside bends along the south side of the channel. The new bench will be planted with a variety of native shrubs & trees listed on the species table in the draft As-Built Report attached.

6 & 7 – PROJECT SUCCESS, PERFORMANCE STANDARDS and MONITORING REQUIREMENTS: The attachment is a *Draft* Annual Report that includes all info relevant to these sections. Release shall be issued by ACOE when the applicant has met all performance standards.

8 – SITE PROTECTION: Alcoa proposes to protect the offsite mitigation with a Conservation Easement template attached. The easement boundaries shall be posted according to the legal description. Site Protection will include the installation of gates at all entrances, remote cameras and perimeter boundary markers the language of which is illustrated on the attachment labeled "Boundary Markers". The markers shall be reflex fiberglass lathes 6' tall X 4" wide. These markers shall be installed around all mitigation areas including all corners, at each entrance and line-of-site intervals along the perimeter. New and existing cattle fences will be installed, inspected and repaired as necessary.

9 – SITE MANAGEMENT & MAINTENANCE: The applicant proposes that Wetland Services designs, constructs, monitors and maintains the mitigation. All unapproved species existing on the mitigation site shall be removed prior to beginning restoration. Maintenance will be minimized by installing the initial work plan in a single concerted effort so as to derive a comprehensive and professional result. Maintenance will be limited so as to allow the planned ecological condition to develop naturally. Any equipment or materials entering the site shall be free of invasive/exotic propagules. Fertilizer and hand broadcasted seed will be used to bolster bare areas or areas at risk of erosion. Erosion control and replanting requiring powered equipment shall be conducted in a manner most minimally invasive as practical. Erosion control materials shall be biodegradable materials and intended to remain in place to decompose naturally. Invasive/exotic species will be removed by hand as practical, or by mechanical, chemical or fire control as necessary. This removal shall be conducted so as to minimize damage to desirable vegetation. Predation on woody plantings will be controlled by mowing to reduce top cover for rabbits and voles, and raptor perches installed as necessary. All vegetation will be installed in the season most conducive to establishment. If dry conditions occur irrigation will be used. Failed tree plantings in specific zones will be replanted mechanically. Low densities occurring as a mosaic throughout the site will be replanted by hand.

Routine maintenance may include light excavation used to backfill settled areas or dress rill erosion, erosion control practices to prevent or repair minor erosion, chemical or mechanical vegetation removal, or replanting <20% of the project area. Routine maintenance conducted within the site shall be conveyed in the annual report. In circumstances where annual success is contingent on maintenance, the action must be completed prior to end of the monitoring period in order to constitute a successful monitoring period.

10 – ADAPTIVE MANAGEMENT: Areas with diminished tree survival below success criteria will be replanted. If the failure is due to incorrect matching of species to locations (such as hydroperiod) then more suitable species will be re-planted. Under normal conditions this issue will be evident early in the project. If some locations are so wet that only one or two species survive then a modification will be requested such as for Cypress/Buttonbush swamp – Special Aquatic System. Stream stability will be addressed with excavation so as to reshape, relocate, or reorient a channel, or replace stream structures.

Should a specific area(s) of the mitigation prove to be continually problematic despite remedial measures such that success criteria are unattainable, the applicant may forfeit the area(s) from the mitigation. The forfeited area will remain under RC or CE, but with no credit issued for the area. If the area is determined to have value despite a diminished condition, then such areas may remain a part of the mitigation, with credit for the area recomputed at a ratio deemed appropriate by ACOE.

Complete replanting of the site or reconstruction of the stream shall occur only once. If the same issue is reencountered, the applicant shall provide an alternative mitigation plan which may include

the purchase of credits from a bank, payment of an in-lieu fee, or other corrective measures. The use of an alternative site to compensate for areas deemed out of compliance shall require ACOE approval of the site, the mitigation plan to implemented on the site, and the monitoring, maintenance & success criteria to be applied to the alternative mitigation.

If ACOE discovers any deficiencies, they shall give written notice to the applicant indicating the need for corrective action sufficient to cure the condition. The applicant shall have 60-days from the onset of suitable field conditions to cure the condition and provide ACOE with an as-built report of the remedial actions. Under circumstances where the condition cannot reasonably be cured within a 60-day period, the Applicant shall update ACOE of the situation, begin and then diligently pursue such cure to completion. In the event the applicant fails to implement remedial actions necessary to attain success, ACOE may notify the applicant that the project is out of compliance. Adaptive management measures require approval from ACOE.

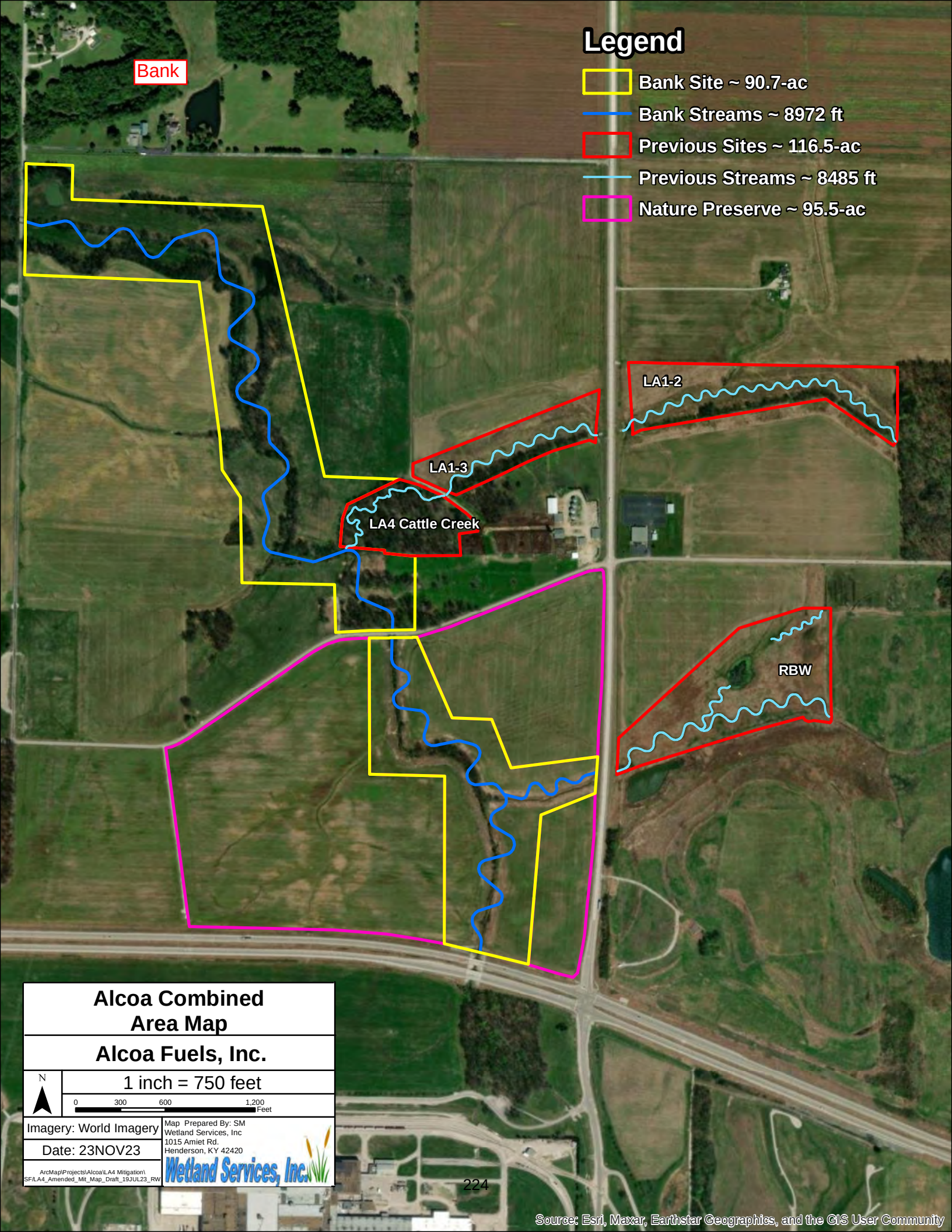
11 – LONG-TERM MANAGEMENT: The sites associated with this CMP will be protected by a deed of conservation easement. A draft copy of the easement is attached and under review with final approval coming from the Corps OC. A draft management agreement between Alcoa & the Steward indicating the Endowment Fee will accompany the final approved CE. These documents will be approved by the Corps OC prior to impacts, and the executed copies submitted to Warrick County for recording within 30-days after the permit is issued. The Steward will hold the conservation Easement, and assume long-term management of all mitigation sites. The Steward shall enforce the terms of the conservation easement with a primary goal of protecting the planned ecological condition. This shall be accomplished by way of post, patrol & enforcement against encroachment. Each owner of mitigation lands protected by Conservation Easement has been briefed and understands that these features exist as jurisdictional Waters of the U.S., afforded full rights of protection under CFR Sections 401 & 404 of the Clean Water Act, and that these protections are enforceable by the U.S. Army Corps of Engineers and the Indiana Department of Environmental Management.

12 – FINANCIAL ASSURANCES: The purpose of financial assurances (FA) is to insure against the liability incurred by ACOE upon issuance of this permit. The cost to complete mitigation varies substantially according to site-specific conditions; stream cost is more variable than wetland cost. In general, the more excavation required to modify topography, or the more structures required to maintain stability, the lesser likelihood of success. Wetland Services has been involved in the 404-process, JD thru Release since 1997. The costs below are estimated based on experience, including full profit margins for us and all third-party vendors. The factors that control stream cost are watershed size, flow regime & slope. In general small flat streams (100-ac on <1% slope) are built at $30/ft while larger sloping streams (400-ac on >1% slope) exceed $100/ft.

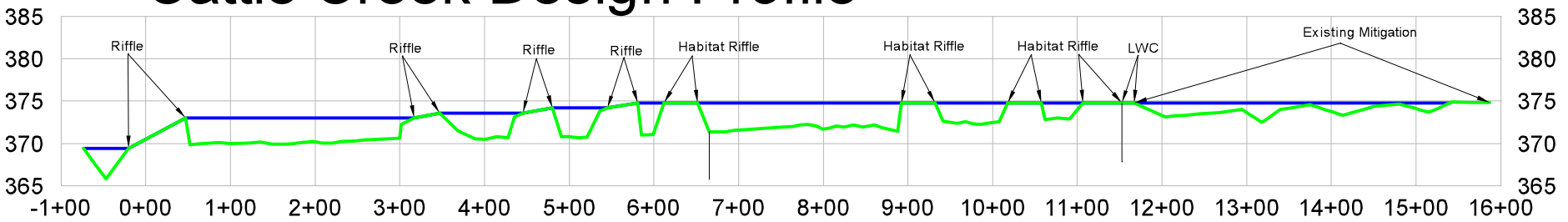
This project consists of offsite mitigation on native land. The offsite mitigation area consists of 10.25-acres owned fee simple by Alcoa which will be protected with a conservation easement. A land value of $10,000/acre has been made available if contingency requires an alternative site.

Offsite Stream Mitigation Protected by Conservation Easement Beginning FA Amounts		
Milestone	**FA Percent of Estimate**	**FA Amount**

Permit Approved			100%			**$335,691**
Release			0%			**$0**
Item	**Units**		**Unit Cost**		**Yrs**	**Total**
Property Control	10.25	ac	$10,000			$102,500
Title Search						$2,100
Legal Description						$8,500
Topo Survey						$8,000
Design & Permitting						$21,000
Bankfull Bench & Stream Construction	487	ft	$310.34	ft		$151,135
Riparian Restoration	0.43	ac	$4500	ac		$2700
PFO Restoration/Creation	2.89	ac	$12,000	ac		$34,680
Stream & Riparian Maintenance	487	ft	$1	ft/yr	10	$487
Stream & Riparian Monitoring	487	ft	$0.50	ft/yr	10	$244
PFO Maintenance	2.89	ac	$50	ac/yr	10	$1,445
PFO Monitoring	2.89	ac	$100.35	ac/yr	10	$2,900
					Total 10-yrs	**$335,691**


Legend
Bank Site ~ 90.7-ac
Bank Streams ~ 8972 ft
Previous Sites ~ 116.5-ac
Previous Streams ~ 8485 ft
Nature Preserve ~ 95.5-ac
Bank
LA1-2
LA1-3
LA4 Cattle Creek
RBW
Alcoa Combined Area Map
Alcoa Fuels, Inc.
N
1 inch = 750 feet
0 300 600 1,200 Feet
Imagery: World Imagery
Date: 23NOV23
ArcMap\Projects\Alcoa\LA4 Mitigation\SF\LA4_Amended_Mit_Map_Draft_19JUL23_RW
Map Prepared By: SM
Wetland Services, Inc
1015 Amiet Rd.
Henderson, KY 42420
Wetland Services, Inc.
224
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Cattle Creek Design Profile



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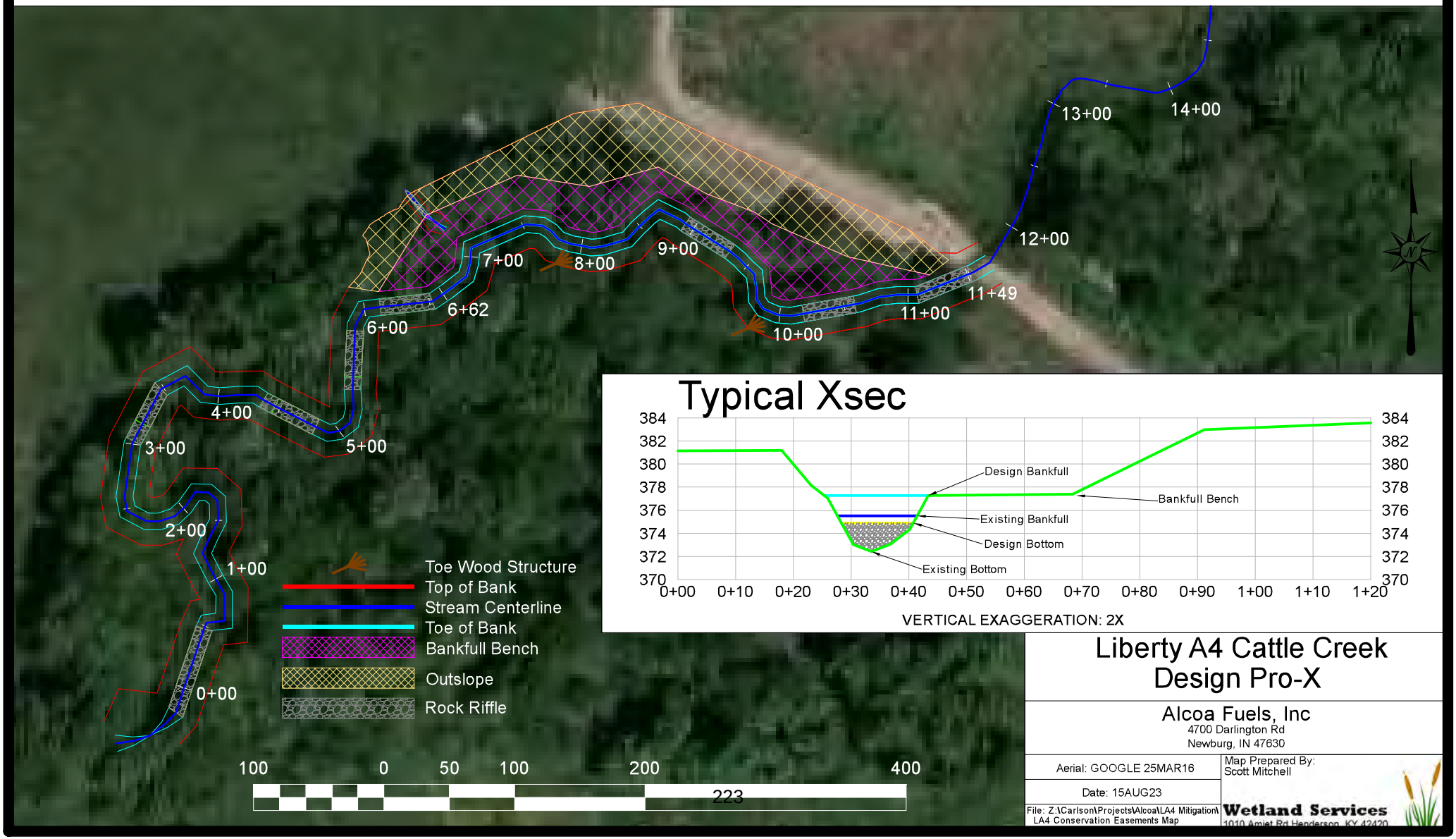


Typical Xsec

VERTICAL EXAGGERATION: 2X

Liberty A4 Cattle Creek Design Pro-X

Alcoa Fuels, Inc
4700 Darlington Rd
Newburg, IN 47630

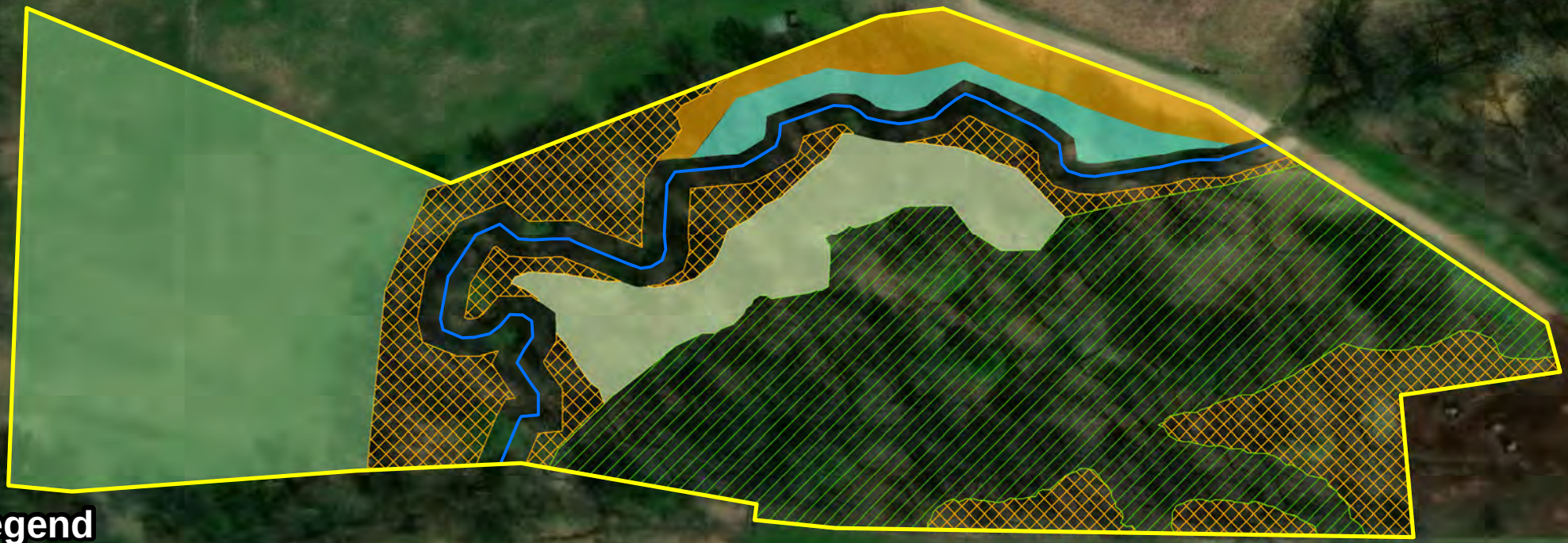
Aerial: GOOGLE 25MAR16

Date: 15AUG23

File: Z:\Carlson\Projects\Alcoa\LA4 Mitigation\LA4 Conservation Easements Map

Map Prepared By:
Scott Mitchell

Wetland Services
1010 Amiet Rd Henderson, KY 42420



Legend

- CE Boundary ~ 10.25-ac
- PFO Creation ~ 0.27-ac
- PFO Enhancement ~ 0.75-ac
- PFO Restoration ~ 2.62-ac
- PFO Preservation ~ 3.57 ac
- Riparian Restoration ~ 0.43-ac
- Riparian Preservation ~ 1.74 ac
- Stream ~ 1,149-ft (0.87-ac)

LA4 Mitigation/Preservation Map (Cattle Creek)

Alcoa Fuels, Inc.

N

1 inch = 150 feet

0 75 150 300 Feet

Imagery: World Imagery

Date: 25JAN24

ArcMap\Projects\Alcoa\LA4 Mitigation\ Cattle_Creek_Enh/Rest_Map_15JAN24_RW

Map Prepared By: RW-RL
Wetland Services, Inc
1015 Amiet Rd.
Henderson, KY 42420

Wetland Services, Inc.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Legend
CE Boundary ~ 68.59-ac
PFO Preservation ~ 51.24-ac
Riparian Preservation ~ 17.18-ac
Stream ~ 1,252-ft (0.17-ac)
LA1-1 Preservation Map
Alcoa Fuels, Inc.
N
1 inch = 250 feet
0 75 150 300 450
Feet
Imagery: World Imagery
Date: 25JAN24
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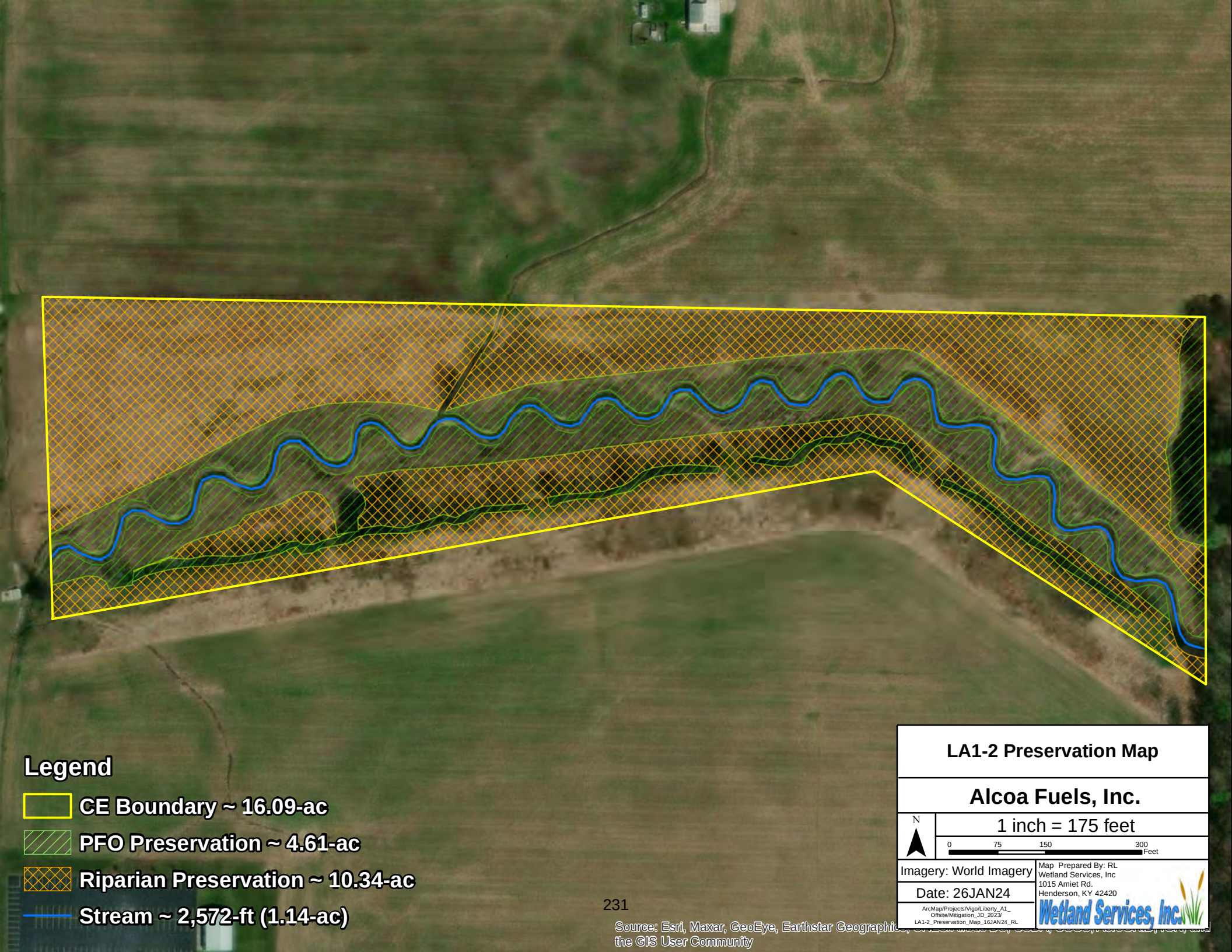
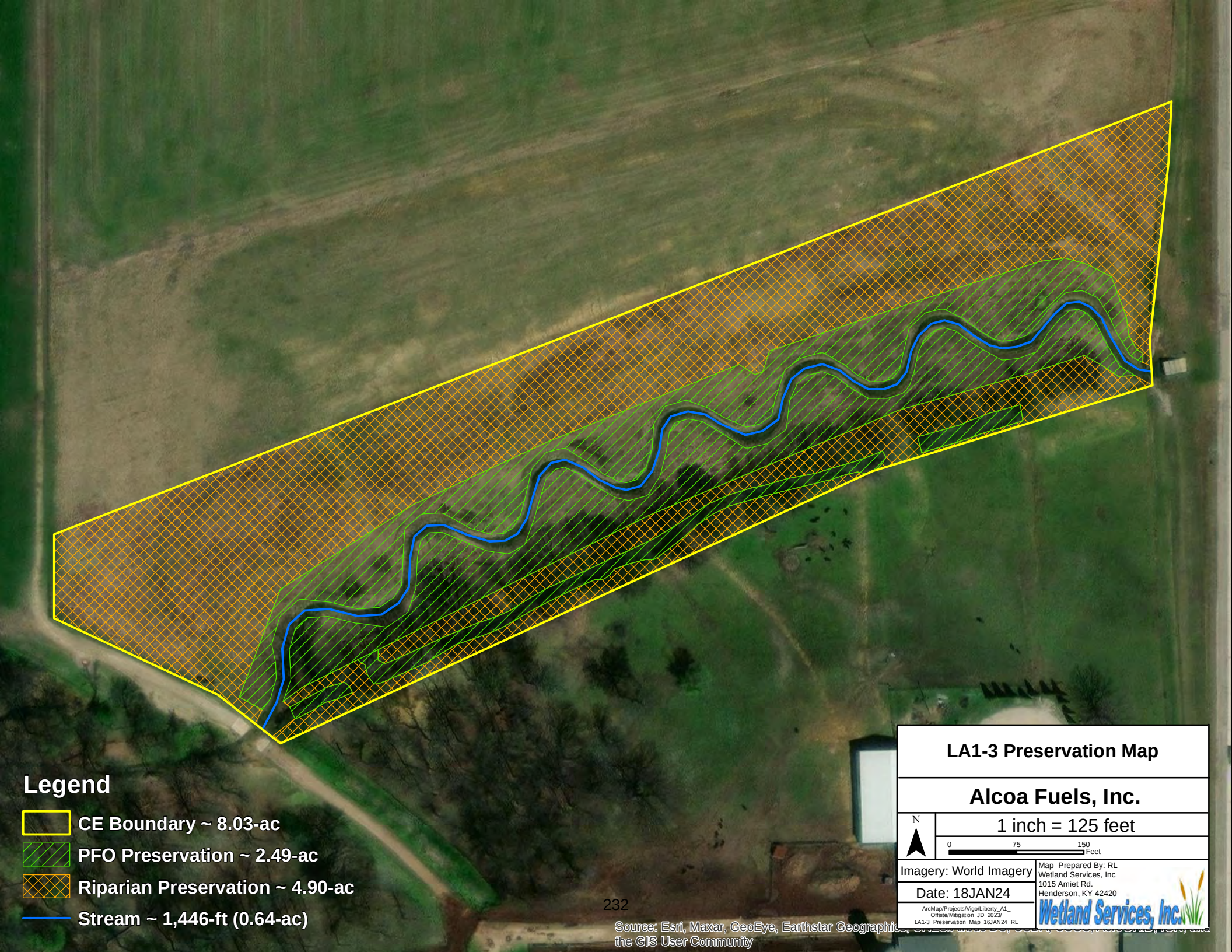
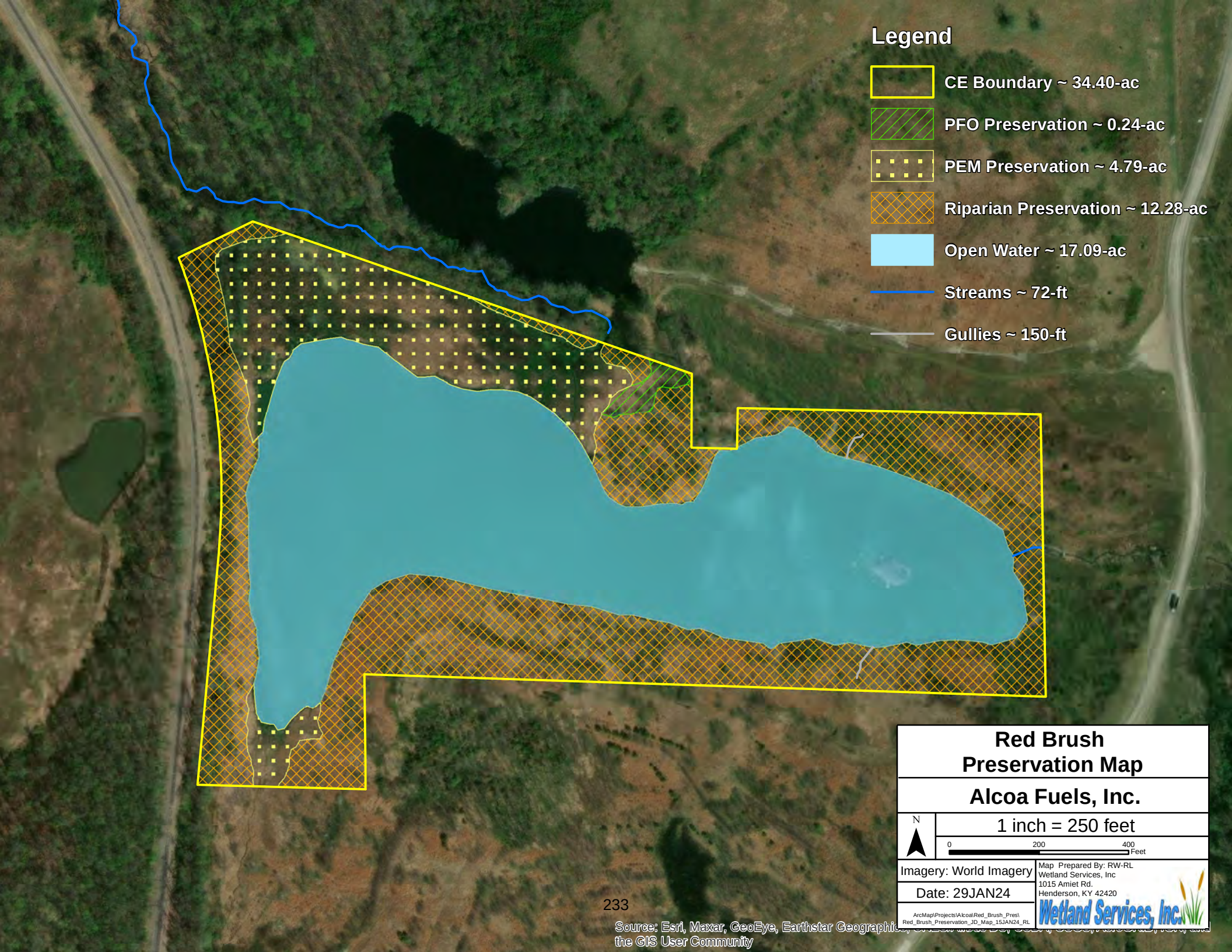
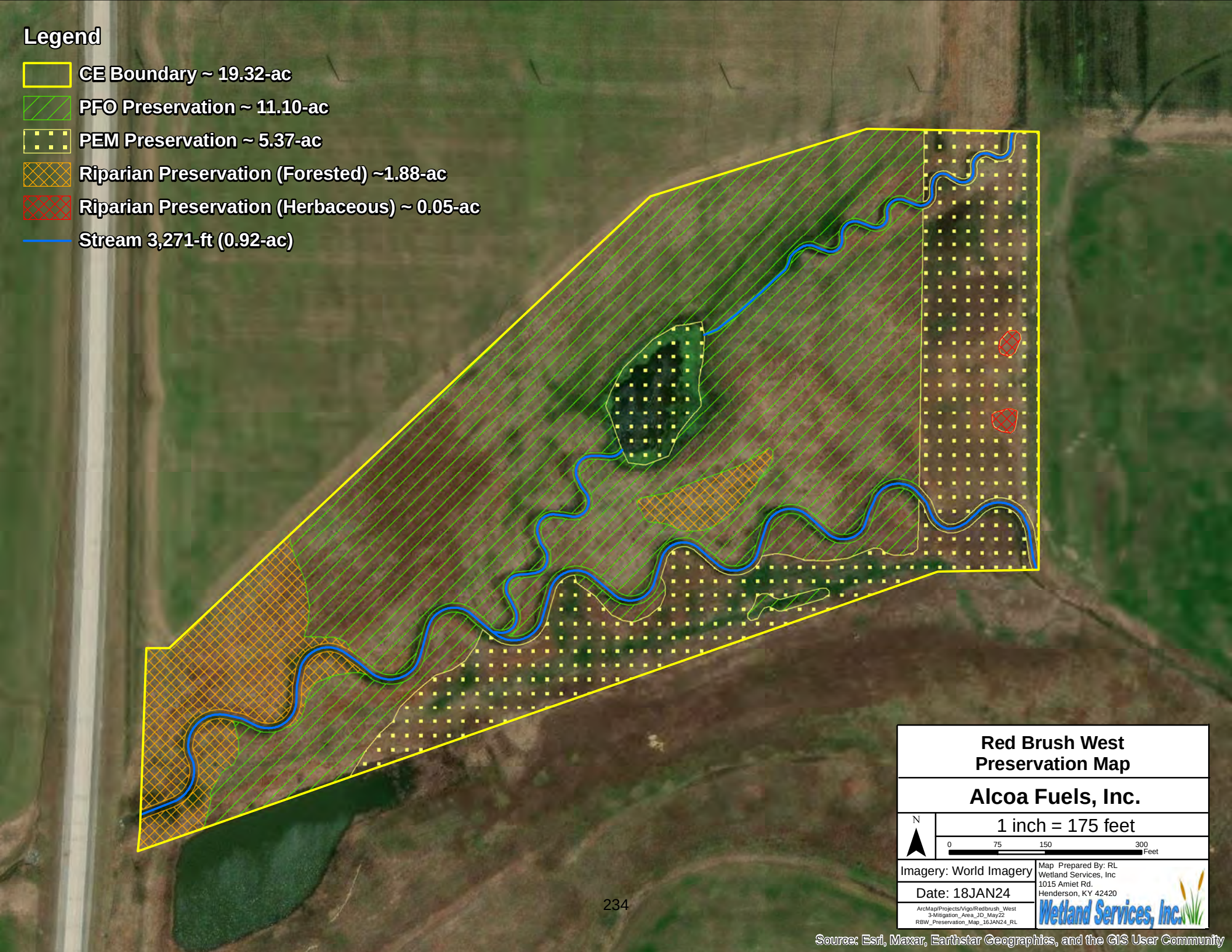
Map Prepared By: RL
Wetland Services, Inc
1015 Amiet Rd.
Henderson, KY 42420
Wetland Services, Inc.
230
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Legend
CE Boundary ~ 16.09-ac
PFO Preservation ~ 4.61-ac
Riparian Preservation ~ 10.34-ac
Stream ~ 2,572-ft (1.14-ac)
LA1-2 Preservation Map
Alcoa Fuels, Inc.
N
1 inch = 175 feet
0 75 150 300
Feet
Imagery: World Imagery
Date: 26JAN24
ArcMap/Projects/Vigo/Liberty_A1_Offsite/Mitigation_JD_2023/LA1-2_Preservation_Map_16JAN24_RL
Map Prepared By: RL
Wetland Services, Inc
1015 Amiet Rd.
Henderson, KY 42420
Wetland Services, Inc.
231
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Legend
CE Boundary ~ 8.03-ac
PFO Preservation ~ 2.49-ac
Riparian Preservation ~ 4.90-ac
Stream ~ 1,446-ft (0.64-ac)
LA1-3 Preservation Map
Alcoa Fuels, Inc.
N
1 inch = 125 feet
0
75
150
Feet
Imagery: World Imagery
Date: 18JAN24
ArcMap/Projects/Vigo/Liberty_A1_Offsite/Mitigation_JD_2023/LA1-3_Preservation_Map_16JAN24_RL
Map Prepared By: RL
Wetland Services, Inc
1015 Amiet Rd.
Henderson, KY 42420
Wetland Services, Inc.
232
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Legend
CE Boundary ~ 34.40-ac
PFO Preservation ~ 0.24-ac
PEM Preservation ~ 4.79-ac
Riparian Preservation ~ 12.28-ac
Open Water ~ 17.09-ac
Streams ~ 72-ft
Gullies ~ 150-ft
Red Brush
Preservation Map
Alcoa Fuels, Inc.
N
1 inch = 250 feet
0
200
400
Feet
Imagery: World Imagery
Date: 29JAN24
ArcMap\Projects\Alcoa\Red_Brush_Pres\
Red_Brush_Preservation_JD_Map_15JAN24_RL
Map Prepared By: RW-RL
Wetland Services, Inc
1015 Amiet Rd.
Henderson, KY 42420
Wetland Services, Inc.
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Legend
CE Boundary ~ 19.32-ac
PFO Preservation ~ 11.10-ac
PEM Preservation ~ 5.37-ac
Riparian Preservation (Forested) ~1.88-ac
Riparian Preservation (Herbaceous) ~ 0.05-ac
Stream 3,271-ft (0.92-ac)
Red Brush West
Preservation Map
Alcoa Fuels, Inc.
N
1 inch = 175 feet
0 75 150 300
Feet
Imagery: World Imagery
Date: 18JAN24
ArcMap/Projects/Vigo/Redbrush_West 3-Mitigation_Area_JD_May22 RBW_Preservation_Map_16JAN24_RL
Map Prepared By: RL
Wetland Services, Inc
1015 Amiet Rd.
Henderson, KY 42420
Wetland Services, Inc.
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community