AI : 84562

Coverage #: MSR323026

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Rec'd via email: 08/25/2023

MINING NOTICE OF INTENT (MNOI)
FOR COVERAGE UNDER
MINING STORM WATER, DEWATERING AND NO DISCHARGE
GENERAL PERMIT MSR32 3026
(Number to be assigned by State)

File at least 30 days prior to the commencement of mining; 15 days if a Storm Water Pollution Prevention Plan (SWPPP) is already on file and mine dewatering is not proposed. Lateral expansion of an existing mine that has general permit coverage requires the submittal of the Major Modification Form, not a new MNOI. However, modification of the existing SWPPP to include the expansion is required. Discharge of storm water or impounded water associated with mining or the operation of a wastewater recirculation system with no discharge without written notification of coverage from MDEQ is a violation of State Law.

If the company seeking coverage is a corporation, a limited liability company, a partnership, or a business trust, attach proof of its registration with the Mississippi Secretary of State and/or its Certificate of Good Standing. This registration or Certificate of Good Standing must be dated within twelve (12) months of the date of the submittal of this coverage form. Coverage will be issued in the company name as it is registered with the Mississippi Secretary of State.

Please indicate the activities to be covered by this MNOI (check all that apply).

- [x] **Storm Water Discharges Associated with Mining**
- [ ] **Mine Dewatering**
- [ ] **Wastewater Recirculation System with No Discharge**

The appropriate section of the MNOI must be completed if the applicant proposes to discharge storm water, discharge impounded mine water (dewatering) and/or operate a wastewater recirculation system with no discharge.

A site-specific Storm Water Pollution Prevention Plan (SWPPP) developed in accordance with ACT5 of the General Permit and a United States Geological Survey (USGS) quadrangle map or photocopy, indicating the site location and outfalls must be included with the MNOI submittal. The name of the quadrangle map must be shown on all copies. Quadrangle maps can be obtained from the MDEQ, Office of Geology at 601-961-5523. Additional submittals may include the following (check all that apply).

- [ ] **Section 404 Documentation**
- [x] **Notice of Exempt Operations Form**
- [ ] **Dam/Reservoir Safety Permit or Written Authorization**

ALL INFORMATION MUST BE COMPLETED (indicate "N/A" where not applicable)

O.C

MSR32 3026

(NUMBER TO BE ASSIGNED BY STATE)

APPLICANT IS THE: ☐ **OWNER** ☑ **OPERATOR**

OWNER CONTACT INFORMATION

OWNER CONTACT PERSON: Kevin Harrison

OWNER COMPANY LEGAL NAME: Harrison Logging

OWNER STREET OR P. O. BOX: P.O. Box 336

OWNER CITY: Duckhill **STATE:** MS **ZIP:** 38925

OWNER PHONE #: (662) 515-7037 **OWNER EMAIL:** harrisonloggin@yahoo.com

OPERATOR CONTACT INFORMATION

OPERATOR CONTACT PERSON: Tracy Bedwell

OPERATOR COMPANY LEGAL NAME: TL Wallace Construction, Inc.

OPERATOR STREET OR P. O. BOX: 4025 Highway 35N

OPERATOR CITY: Columbia **STATE:** MS **ZIP:** 39429

OPERATOR PHONE #: (601) 441-6434 **OPERATOR EMAIL:** tbedwell@tlwallace.com

MINE INFORMATION

MINE NAME: Harrison Logging Mine

MINE SITE ADDRESS (If the physical address is not available, please indicate nearest named road.)

Street: 864 Butputter Road

City: Gore Springs **State:** MS **County:** Grenada **Zip:**

SE /4 OF NE /4 OF SECTION 8, TOWNSHIP 22N, RANGE 7E

MINE SITE TRIBAL LAND ID (N/A If not applicable): N/A

ATTACH A USGS QUAD MAP, EXTENDING ½ MILE BEYOND FACILITY, OUTLINING THE MINE BOUNDARIES
(Maps can be obtained from the Mississippi Office of Geology. For information call 601-961-5523).

LATITUDE: 33 **degrees** 46 **minutes** 27 **seconds** **LONGITUDE:** 89 **degrees** 35 **minutes** 46 **seconds**

LAT & LONG DATA SOURCE (GPS (*Please GPS Entrance Gate*) or Map Interpolation): Google Earth

TOTAL ACREAGE: 4 **MATERIAL TO BE MINED:** GENERAL FILL B9

WILL HYDRAULIC DREDGING BE USED? ☐ **YES** ☑ **NO**

WASHING OF SAND/GRAVEL? ☐ **YES** ☑ **NO**

ESTIMATED START DATE: 2023 08/25 (YYYY-MM-DD)

ESTIMATED END DATE: 2025 March (YYYY-MM-DD)

SIC CODE 144669901

NAICS CODE 212322

RECEIVING STREAM INFORMATION

NEAREST NAMED RECEIVING STREAM: Unnamed Tributary of Butputter Creek

IS RECEIVING STREAM ON MISSISSIPPI'S 303(D) LIST OF IMPAIRED WATER BODIES? (The 303(d) list of impaired waters and TMDL stream segments may be found of MDEQ's website: http://www.deq.state.ms.us/MDEQ.nsf/page/TWB_Total_Maximum_Daily_Load_Section**)** ☑ **YES** ☐ **NO**

HAS A TMDL BEEN ESTABLISED FOR THE RECEIVING STREAM SEGMENT? ☑ **YES** ☐ **NO**

COMPLETE IF STORM WATER DISCHARGE IS PROPOSED

ATTACH A STORM WATER POLLUTION PREVENTION PLAN (SEE PERMIT FOR REQUIREMENTS)

IDENTIFY THE ASSOCIATION OR GENERIC SWPPP ON FILE AT MDEQ: Please see attached

COMPLETE IF WASTEWATER RECIRCULATION SYSTEM WITH NO DISCHARGE IS PROPOSED

DISTANCE BETWEEN RECIRCULATION POND(S) AND PROPERTY LINE: NA **(FT)**
(MUST BE AT LEAST 150 FEET)

NUMBER OF RECIRCULATION POND(S): NA

STORAGE CAPACITY OF EACH RECIRCULATION POND(S): NA **(FT^3)**

COMPLETE IF MINE DEWATERING IS PROPOSED

ESTIMATED DEWATERING VOLUME: NA **(GAL/DAY)**

NAME AND ADDRESS OF THE RECIPIENT OF THE DISCHARGE MONITORING REPORTS (DMRs), IF DIFFERENT FROM SIGNATORY: NA

DOCUMENTATION OF COMPLIANCE WITH OTHER REGULATIONS/REQUIREMENTS

Coverage under this general permit will not be granted until all other required MDEQ permits and approvals are addressed.

WILL THE CONSTRUCTION OR OPERATION OF THIS MINE INVOLVE THE RE-ROUTING, FILLING OR CROSSING OF A WATER CONVEYANCE OF ANY KIND? ☐ YES ☑ NO

If yes, contact the U.S. Army Corps of Engineers' Regulatory Branch for permitting requirements. If the mine requires a Corps of Engineers Section 404 permit, provide appropriate documentation with this MNOI that:

- The mine has been approved by individual permit, or
- The work will be covered by a nationwide permit and NO NOTIFICATION to the Corps is required, or
- The work will be covered by a nationwide or general permit and NOTIFICATION to the Corps is required.

LIST ANY NPDES PERMIT NO(s)._____ GEOLOGY APPLICATION/PERMIT NO. _____

LIST OTHER GEOLOGY PERMIT NUMBERS THAT APPLY TO COVERAGE AREA _____

IS THE MINE LESS THAN 4 ACRES AND GREATER THAN 1320 FEET FROM ANOTHER MINE?

☑ YES A "Notice of Exempt Operations" Form must be included with the MNOI or proof of prior submission, if previously submitted to the Office of Geology.

☐ NO A "Notice of Intent to Mine Class I or Class II Materials" Form must be filed before coverage will be granted under the Mining General Permit. For information on Office of Geology requirements, call 601-961-5515.

LIST ANY LOCAL STORM WATER ORDINANCES WITH WHICH THE OPERATIONS MUST COMPLY AND SUBMIT ANY ASSOCIATED APPROVAL DOCUMENTATION. The BMPs listed in the SWPPP comply with Grenada Co Storm Water Guidance

IF IMPOUNDMENTS WILL BE CONSTRUCTED ABOVE NATURAL SURFACE ELEVATIONS, INDICATE WHICH, IF ANY, OF THE FOLLOWING APPLY.

☐ The impoundment will be constructed with a peripheral dam or levee 8 feet or greater in height, measured from the lowest elevation of its toe.

☐ The impoundment will have a maximum storage volume greater than 25 acre-feet.

☐ The impoundment will impound a watercourse with a continuous flow.

☐ The impoundment has the potential to threaten downstream lives or man-made structures.

If <u>any</u> of the impoundments meet any of the above criteria, the applicant will be required to obtain written authorization from MDEQ, Dam Safety Division before coverage will be granted under the Mining General Permit.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature[1] — Date: 8/25/23

David Clark — Printed Name

LP — Title

[1]This application shall be signed according to the General Permit, Act 15, T-4 as follows:

- For a corporation, by a responsible corporate officer.
- For a partnership, by a general partner.
- For a sole proprietorship, by the proprietor.
- For a municipal, state or other public facility, by either a principal executive officer, the mayor, or ranking elected official.
- Duly Authorized Representative

Please submit this form to:

Chief, Environmental Permits Division
MDEQ, Office of Pollution Control
P.O. Box 2261
Jackson, Mississippi 39225

HARRISON MINE
MINING STORM WATER POLLUTION PREVENTION PLAN

GRENADA COUNTY, MISSISSIPPI

PREPARED FOR:

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Office of Pollution Control (OPC)

PREPARED BY:

T. Wallace Construction, Inc.

4025 Highway 35N
Columbia, MS 39429
(601) 441 - 6434

2023 August 25

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CERTIFICATION

Kerry Shane Gibson will be the certified erosion control person responsible for the above referenced project. If an alternate is needed, Mr. Curt Thomas, will take over the role. Mr. Gibson and Mr. Thomas's Storm Water Management Training Certificate of Completion is included in Appendix D.

Prime Contractor's Signature	Date
David Clark	8/24/23
Printed Name	Date

1.0 INTRODUCTION

1.1 Purpose

Pursuant of the Mississippi Department of Environmental Quality (MDEQ) Office of Pollution Control's (OPC's) *Mining Storm Water, Dewatering, and No Discharge General Permit* (MSR32), the permittee, TL Wallace Construction, Inc. (TLW), is required to develop and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with sound engineering practices. This SWPPP will be dynamic and address the mining/reclamation environmental measures and Best Management Practices (BMPs) which, when implemented, will minimize exposed soil erosion and sediment laden storm water discharges. If, during soil disturbing activities, site conditions contrary to those mentioned in this SWPPP are encountered, any necessary modifications will be made to the plan to ensure compliance with MSR32. Activities to be conducted at the site that may disturb soil consist of:

- mining of general fill

1.2 Project Overview

As part of a bridge replacement project on SR 8, in Grenada, County, TLW plans to mine approximately 70,000 CU.YD. of general fill from the subject property owned by Harrison Logging, Inc. During Excavation, TLW will function as the operator of the mine until the site has been reclaimed as pasture land.

The site may be accessed by a dirt field road that can be accessed via Butputter Road near the town of Gore Springs, in Grenada County, MS. (Please see Figure 1)

1.3 Site Description

The subject property consists of moderate elevation change with storm water flowing radially from the top of the hill out in all directions before converging in either an unnamed tributary of Butputter Creek that runs east then north east, or a farm pond whose discharge flows northeast toward butputter creek.

Butputter Creek is on the 303d for impaired streams whose impairment is fecal coliform, with an established TMDLs as shown below:

Total Maximum Daily Load for Segment 802611

WLA (counts per day)	LA (counts per day)	MOS (counts per day)	Total TMDL (counts per day)	TMDL Percent Reduction
0.00E+00	5.61E+10	6.23E+09	6.23E+10	73.5%

Please see the Appendix A for the full MDEQ report concerning the subject portion of Butputter Creek.

Considering the biological nature of Fecal Coliform, the proposesed mining operation is not expected to negatively impact the TMDL. As an additional precaution, however, TLW will use a sump in the eastern section of the mine to function as a sediment basin to mitigate any additional impairment of the creek that may result in sediment loading caused by the mining operation. The sediment basin will make use of infiltration and evaporation as to discharge onsite stormwater.

2.0 SWPPP NARRATIVE REQUIREMENTS

MSR32 requires that:

"The owner or operator shall design, install, and maintain controls in accordance with the standards set forth in the most recent edition of Mississippi's "Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas (Three Volumes) ," other recognized manuals for storm water controls design, or provide a design that has been certified by a Mississippi registered professional engineer. "Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas (Three Volumes)" can be accessed at http://www.deq.state.ms.us/MDEQ.nsf/page/epd_epdgeneral. These controls shall be appropriate for the mining activities, which may include but not be limited to removing, stockpiling, and restoring any overburden; removing, processing, stockpiling and shipping mined material; and storing or disposing of any waste product generated during the mining activity. [11 Miss. Admin. Code Pt. 6, Ch. 1.]

Pursuant of these requirements TLW will implement controls as mentioned in **Sections 2.1 – 6.0** of this report. Please see how TLW will address each section requirement below.

2.1 Site Specific Erosion Control Measures and Procedures

"(1) Control storm water volume and velocity within the site to minimize soil erosion;"

Topsoil stripped during site clearing will be placed on the perimeter of the mine, seeded with perineal grass (and ryegrass if necessary for temporary cover, See Appendix F for schedule), and used as a diversion berm. See Figure 2. The diversion berm will function to route offsite water around the mine area and route mining area storm water into a sump located at the NE corner of the mining area. Collected storm water from the mining area will be discharged via infiltration and evaporation, therefore, reducing peak runoff flowrates and storm water runoff volume.

"(2) Control storm water discharges, including both peak flow rates and total storm water volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion;"

Please see above section 2.1.1

"(3) Minimize the amount of soil exposed during mining activity;"

Soil disturbed during mining activities will, to the extent practicable, commence in phases to limit the amount of soil exposed at any given time. The exact time of each phase will be determined by demand, which is a currently an unknown variable, however, each phase will be broken up into 100' strips, beginning in the east section of the pit and progressing west with the first strip. Please see **Figure 2** for mining phase layout.

"(4) Minimize the disturbance of steep slopes;"

TLW will, to the extent practicable, limit the disturbance of steep slopes to a 3:1 minimum, unless otherwise approved by MDEQ.

"(5) Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting storm water runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;"

The series of erosion control measures mentioned in section (2.1) above will help minimize sediment discharges from the site by reducing peak flow rates and runoff volumes.

"(6) Provide and maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible (see buffer zone requirements in ACT9); and"

The site is located near the center of a cow pasture. **Though independent of this permit**, the owner of the property, Kevin Harrison of Harrison Logging, Inc., has agreed to leave all existing vegetation surrounding the mine in place to function as a vegetated buffer strip. At its nearest location, the mine will have a 500-ft minimum buffer strip between the limit of soil disturbing activities and the nearest unnamed tributary of Butputter Creek. This buffer strip is not shown on Figure 2, as it is an additional control not required by the storm water permit.

"(7) Minimize soil compaction and, unless infeasible, preserve topsoil;"

Topsoil will be preserved in perimeter berms located at the limits of the proposed mine area during construction. Topsoil will then be spread as needed to reestablish vegetation in disturbed areas remaining undisturbed for more than 30 days, and during reclamation. (See Figure 2)

"(8) Direct storm water to vegetated areas, brush barriers, silt fences, hay bales, etc. to aid in the filtration, infiltration, velocity reduction and diffusion of the discharge;"

Please see Figure 2 for applicable storm water controls.

"(9) Transport runoff down steep slopes through lined channels or piping; and"

Steep slopes in excess of 3:1 are not expected on the subject property. Please see Figure 2 for grading plan.

"(10) Minimize off-site vehicle tracking of sediments. [11 Miss. Admin. Code Pt. 6, Ch. 1.]"

The site may be accessed by a dirt field road that can be accessed via Butputter Road near the town of Gore Springs, in Grenada County, MS. A construction entrance will be maintained during the duration of this project to minimize off-site sediment tracking.

"As a minimum, the controls must be in accordance with the standards set forth in the most current edition of the "Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas (Three Volumes)" or other recognized manual of design. The SWPPP shall address the following minimum components.

"(1) A scaled site map shall be prepared showing boundaries of property and proposed mining site, buffer zone compliance, original and proposed contours (if practicable), drainage patterns, adjacent receiving water bodies, north arrow, all erosion and sediment controls (vegetative and structural), and the location of housekeeping practices."

See Figures 1 and 2.

"(2) Vegetative practices shall be designed to preserve existing vegetation where possible and re-vegetate disturbed areas as soon as practicable after clearing, grading, excavating or other land disturbing activities. Such practices may include, but are not limited to, surface roughening, temporary seeding, permanent seeding, mulching, sod stabilization, vegetative buffer strips, and protection of trees. When a disturbed area not actively being mined will be left undisturbed for 30 days or more, the appropriate temporary or permanent vegetative practices shall be implemented within seven (7) calendar days. [11 Miss. Admin. Code Pt. 6, Ch. 1.]

Mining will commence in a phased manner to reduce the area of disturbed soil at any given time, see Figure 2. TLW will seed areas that will be undisturbed for 30 days or more.

Seeding rates, planting times, fertilization rates, and methods of establishment will be conducted as needed and in accordance with the prescribed seeding and fertilizing schedule shown in Appendix F.

"(3) Structural practices shall divert flows from exposed soils, store flows or otherwise limit runoff from exposed areas. Such practices may include, but are not limited to, construction entrance/exit, earth dikes, brush barriers, drainage swales, check dams, subsurface drains, pipe slope drains, level spreaders, drain inlet protection, outlet protection, detention/retention basins, sediment traps, temporary sediment basins or equivalent sediment controls. Because mining is generally of long duration, temporary measures such as hay bales will not, as a stand alone practice, be accepted to satisfy structural requirements due to their associated high maintenance frequency. However, they may be used in conjunction with other structural practices, such as strengthening silt fences."

TLW will implement a perimeter topsoil berm inside the mining boundary (**See Figure 2).**

"(4) Construction exits (see Definition) shall be installed wherever traffic will be leaving a mining site and moving directly onto a paved public road."

Traffic leaving the site will use a construction entrance shown in Figure 2.

"(5) Temporary (or permanent) sediment basins, providing at least 3600 cubic feet (133 cubic yards) of storage per acre drained, shall be provided until final stabilization of the site. Sediment basins must be installed before major site grading and utilize outlet structures that withdraw water from the surface."

A 40’ x 40’ sump whose planned total depth is 11’ will be constructed in the Northeastern portion of the mine to function as a sediment basin. The sump will discharge stormwater via infiltration and evaporation.

“(6) A description of post-mining control measures for "Exempt Operations." Post-mining control measures shall be installed to control pollutants in storm water after mining is complete. These controls include, but are not limited to, one or more of the following: on-site infiltration of runoff, flow attenuation using open vegetated swales and natural depressions, constructed wetlands, lakes, ponds and retention/detention structures. Velocity dissipation devices shall be placed at detention or retention pond outfalls and along the outfall channel to provide for a non-erosive flow. [11 Miss. Admin. Code Pt. 6, Ch. 1.]”

The reclamation plan for the site includes reducing all steep slopes (if they are created during mining), recoverage of topsoil over the entire site and the seeding of topsoil to permanently stabilize soil. Once vegetation is established, the area will function as a grassy pasture.

2.2 Non-Storm Water Discharge Management:

“The SWPPP must identify any allowable non-storm water discharges, identified in ACT 2, T-4, except for flows from actual fire fighting, which are combined with storm water discharges associated with mining activity at the site. Non-storm water discharges should be eliminated or reduced to the extent feasible. The SWPPP must identify and ensure the implementation of appropriate Best Management Practices (BMPs) for the non-storm water component of the discharge. [11 Miss. Admin. Code Pt. 6, Ch. 1.]”

Allowable Non-storm water discharges that may be encountered on the site during mining and reclamation procedures may include:

1. Water used in dust suppression (if needed)
    a. During dust suppression, the ground surface is expected to absorb any water applied and will thus result in zero discharge.

2.3 Implementation of Controls:

"The plan shall require the owner/operator during mining preparation (e.g. clearing and grubbing) to implement controls necessary to mitigate erosion and adverse impacts to offsite areas and receiving streams. During and after mining, vegetative and structural practices shall be maintained as set forth in the approved SWPPP. [11 Miss. Admin. Code Pt. 6, Ch. 1.]"

During mining preparation, TLW will implement storm water controls in the following sequence:

1. Clear topsoil from mining area into stockpiles in 100' phases

2. Seed Topsoil piles with temporary (if needed) and permanent seed.

During and after mining activities have been completed, TLW will implement the following storm water controls in the following sequence:

1. Repair any rills and washes
2. Dress up existing slopes with topsoil and applicable seeding
3. Perform housekeeping measures

2.4 Implementation Sequence:

"The owner or operator shall prepare an orderly listing which coordinates the timing of all major land-disturbing activities together with the necessary erosion and sedimentation control measures planned for the project. [11 Miss. Admin. Code Pt. 6, Ch. 1.]"

All major land-disturbing activities and their respective erosion and sedimentation control measures are planned to commence as shown:

1. Submit Exempt Operations Form, and Storm Water NOI (with applicable SWPPP) (August 2023)
2. Receive Stormwater Permit approvals (Late August 2023)
3. Strip Topsoil/Seed Topsoil Stockpile/Berm (As needed during phasing 2023)
4. Begin Mining (Late August 2023)
5. Complete Mining Activities (March 2025)
6. Reclaim site by spreading topsoil and reseeding per Appendix F (May 2025)
7. Submit paperwork to close mining storm water permit and close exempt operations status.

2.5 Maintenance and Monthly Inspections:

"The SWPPP shall describe procedures to maintain vegetation, erosion and sediment controls and other protective measures. Procedures shall provide that all erosion controls and outfalls/discharge points are inspected a minimum of once per month and after rain events in accordance with ACT7, S-1. [11 Miss. Admin. Code Pt. 6, Ch. 1.]"

TLW will perform erosion control inspections at least once per month and after rain events. During inspections, if storm water controls are found to be nonfunctioning, non-functioning controls will be repaired, replaced or supplemented with functional controls within 24 hours of discovery or as soon as field conditions allow.

All Erosion Control Inspections are to be recorded on the form attached in **Appendix A**.

2.6 Housekeeping Practices:

The owner or operator shall describe and list practices appropriate to prevent pollutants from entering storm water from mining sites due to poor housekeeping.

The owner or operator shall:

1. *Designate areas for equipment maintenance and repair*

All non-routine equipment maintenance and repair will be performed offsite. All routine maintenance will be performed in the mining area.

2. *Provide waste receptacles at convenient locations*

(See Figure 2)

3. *Provide regular collection of waste*

Waste will be collected and disposed of by onsite personnel daily

4. *Provide protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials*

Potentially toxic materials will be stored offsite and brought to the site as needed

5. *Provide adequately maintained sanitary facilities*

See Figure 2 for the location proposed sanitary facilities (i.e. port-a-potty) locations.

8. *Provide secondary containment around on-site fuel tanks*

All equipment will be refueled with a mobile refueling truck. The site will not consist of any on-site fuel tanks.

9. *Implement spill and leak prevention practices and response procedures if spills and leaks do occur*

TLW will implement the following practices and procedures to limit the occurrence and migration of spills

a. Promptly transfer used fluids to the proper waste or recycling drums.

b. Full drip pans or other open containers will not be left sitting out for extended periods of time.

c. All recovered fluids will be transported off-site for disposal at an appropriate facility.

d. Cracked batteries should be stored in non-leaking secondary containers.

e. Any fuel spills will be promptly cleaned and disposed of in an effective manner.

f. A small spill response kit will kept onsite and easily accessible at all times.

10. *Minimize the exposure of mining/construction materials and equipment*

The following controls and procedures will be implemented to minimize the exposure of mining/construction materials and equipment:

During mining activities, all equipment used onsite will have non-routine maintenance performed offsite. Routine maintenance will be performed inside the mining area (See Figure 2) and conducted in a manner that minimizes the potential for petroleum product spillage and/or leakage. All required precautions will be taken to prevent the release of fuel, oils, hydraulic fluids, cleaning solutions, and solvents to the environment.

"Releases into the environment of hazardous substances, oil, pollutants or contaminants which pose a threat to applicable water quality standards, or causes a film sheen or discoloration of waters of the State, shall be reported to the:

Mississippi Emergency Management Agency (601) 352-9100 or National Response Center 1-800-424-8802*. [11 Miss. Admin. Code Pt. 6, Ch. 1.]"*

3.0 SWPPP IMPLEMENTATION REQUIREMENTS:

TLW will implement this SWPPP in accordance to the guidance listed below.

"The coverage recipient shall:

(1) Implement the SWPPP and retain a copy of the SWPPP at the permitted site or locally available (see Definition). Failure to implement the SWPPP is a violation of permit requirements. A copy of the SWPPP must be made available to the MDEQ inspectors for review at the time of an on-site inspection.
(2) Ensure that appropriate Best Management Practices (BMPs) are in place upon commencement of mining operations.
(3) Amend the SWPPP if notified at any time by the Executive Director of MDEQ that the SWPPP does not meet the minimum requirements. A written certification must also be submitted to the Executive Director stating that the requested changes have been made. Unless otherwise provided, the requested change shall be made within 15 days.
(4) Amend the SWPPP whenever there is a change in design, construction, operation, or maintenance which may potentially affect the discharge of pollutants to waters of the State or if the SWPPP proves to be ineffective in controlling storm water pollutants. The amended SWPPP shall be submitted to MDEQ within 30 days of amendment.
(5) Submit to MDEQ the Major Modification Form **(Appendix B)** *for subsequent phases, expansions and modifications of mining development that are proposed but were not included in the original SWPPP.*
(6) Install needed erosion controls, even if they may be located in the way of subsequent activities. It shall not be an acceptable defense that controls were not installed because subsequent activities would require their replacement or cause their destruction. [11 Miss. Admin. Code Pt. 6, Ch. 1.]
(7) Install additional and/or alternative erosion and sediment controls when existing controls prove to be ineffective in preventing sediment from leaving the site.
(8) Minimize off-site vehicle tracking of sediments.
(9) Comply with applicable State and local waste disposal, sanitary sewer or septic system regulations.
(10) Maintain all erosion controls. Except for sediment basins, all accumulated sediment shall be removed from structural controls when sediment deposits reach one-third to one-half the height of the control. For sediment basins, accumulated sediment shall be removed when the capacity has been reduced by 50%. All removed sediment deposits shall be properly disposed. Non-functioning controls shall be repaired, replaced or supplemented with functional controls within 24 hours of discovery or as soon as field conditions allow.
(11) Implement steps necessary to meet a specific wasteload allocation established subsequent to coverage issuance. [11 Miss. Admin. Code Pt. 6, Ch. 1.]"

If during mining or reclamation activities ownership of the borrow area changes, or if the name of TL Wallace Construction Inc. changes, please see the "Request for Transfer of Permit, General Permit Coverage and/or Name Change" form in **Appendix C.**

3.1 Requirement to Identify Mine Boundaries:

"Boundaries of areas issued a Certificate of Coverage under this permit shall be marked and durable posts shall be placed at the corners of the coverage area. The posts shall be painted or flagged to be readily visible during the life of the operation. [11 Miss. Admin. Code Pt. 6, Ch. 1.]"

TLW will install marked and durable posts in the corners of the proposed mining area before the commencement of mining activities. Please see Figure 2 for GPS Corner Locations.

3.2 SWPPP Compliance with Local Storm Water Ordinances:

(1) The SWPPP shall be in compliance with all local storm water ordinances.
(2) When storm water discharges into a Municipal Separate Storm Sewer System (MS4), the coverage recipient shall make the SWPPP available to the local authority upon request. [11 Miss. Admin. Code Pt. 6, Ch. 1.]"

This SWPPP was created in compliance with Grenada County storm water regulations.

This site location has also been cleared by the following entities:

- **Appendix G: Department of the Interior - Fish and Wildlife** – Threatened and Endangered Species Review Letter
- **Appendix H: MS Department of Archives and History** – Letter of Concurrence
    - Please also see the corresponding Cultural Resources Survey from

4.0 REPORTING:

TLW will perform monthly inspections of the mining area in accordance with the guidance mentioned below.

The coverage recipient shall submit analytical results of monitoring conducted according to the provisions of T-3 of this ACT on a Discharge Monitoring Report (DMR) due annually by the 28th of January. DMRs shall be submitted electronically using the MDEQ NetDMR system (ref. NPDES Electronic Reporting Rule promulgated at 40 CFR 127 on October 22, 2015). Instructions for NetDMR registration can be found on MDEQ's website at: http://www.deq.state.ms.us/MDEQ.nsf/page/NetDMR_NetDMRClassroomTraining. [11 Miss. Admin. Code Pt. 6, Ch. 1.]

Chief, Environmental Compliance and Enforcement Division
Mississippi Department of Environmental Quality
PO Box 2261
Jackson, MS 39225. [11 Miss. Admin. Code Pt. 6, Ch. 1.]

5.0 TRAINING

TLW maintains up to date erosion control certifications that cover the topics listed below. A copy of these certifications are included in Appendix D.

5.1 Training Documentation

"Personnel training conducted to meet the requirements of this ACT shall be documented. Training records shall include employee's name, worker identification number, date of training, contents of training, and the employee's signature acknowledging that training was received. All training records shall be maintained for at least three years from the date of training. [11 Miss. Admin. Code Pt. 6, Ch. 1.]"

5.2 Training Program Requirements

The coverage recipient shall develop and implement a program for initial and periodic refresher training of personnel that are responsible for implementing and/or complying with the requirements of this permit. Initial training for all personnel that are responsible for implementing and/or complying with the requirements of this permit shall be performed within twelve (12) months of issuance of coverage or recoverage under this permit. Newly hired employees responsible for implementing and/or complying with the requirements of this permit shall receive initial training prior to performing such responsibilities. Training shall at a minimum address, but not be limited to, the following elements:

(1) SWPPP goals and plan components identified in ACTs 5 through 8 of this permit, including:

> *(A) Housekeeping and pollution prevention requirements,*
> *(B) Spill prevention and response procedures,*
> *(C) Installation, maintenance and inspection of erosion and sediment controls Best Management Practices (BMPs)*

(2) Procedures for monitoring compliance with mine dewatering requirements as prescribed in ACT 12 (if applicable);

(3) Procedures to ensure compliance with the "no discharge" requirement of ACT11 (if applicable);

(4) Recordkeeping, reporting and record retention requirements (includes understanding the records filing system and being able to produce the required permit documentation during an MDEQ on-site inspection). [11 Miss. Admin. Code Pt. 6, Ch. 1.]"

6.0 Termination of Coverage

"Coverage shall be terminated at the request of the coverage recipient only after mining activities have permanently stopped, vegetation has been successfully established, and any permanent controls are stable. Inspections must continue until such time the coverage recipient has received written notice of coverage termination by MDEQ.

(1) For non-exempt mining operations, a complete Request For Termination (RFT) of Coverage Form (see Mining Forms Package) and a copy of the Permit Board Order, authorizing 90% or final release of the mining performance bond, shall be submitted to MDEQ.

(2) For exempt mining operations, within 30 days of final stabilization (see Definition of Final Stabilization in ACT16) for a covered site, a completed Request For Termination (RFT) of Coverage Form (provided in the Mining Forms Package) shall be submitted to the Permit Board. Upon receiving the completed RFT, the MDEQ staff will inspect the site. If no sediment and erosion control problems are identified and adequate permanent controls are established, the owner or operator will receive a termination letter. Coverage is not terminated until notified in writing by MDEQ. Failing to submit a RFT is a violation of permit conditions.

Beginning December 21, 2020, the RFT must be submitted electronically as required by 40 CFR 127.16. [11 Miss. Admin. Code Pt. 6, Ch. 1.]

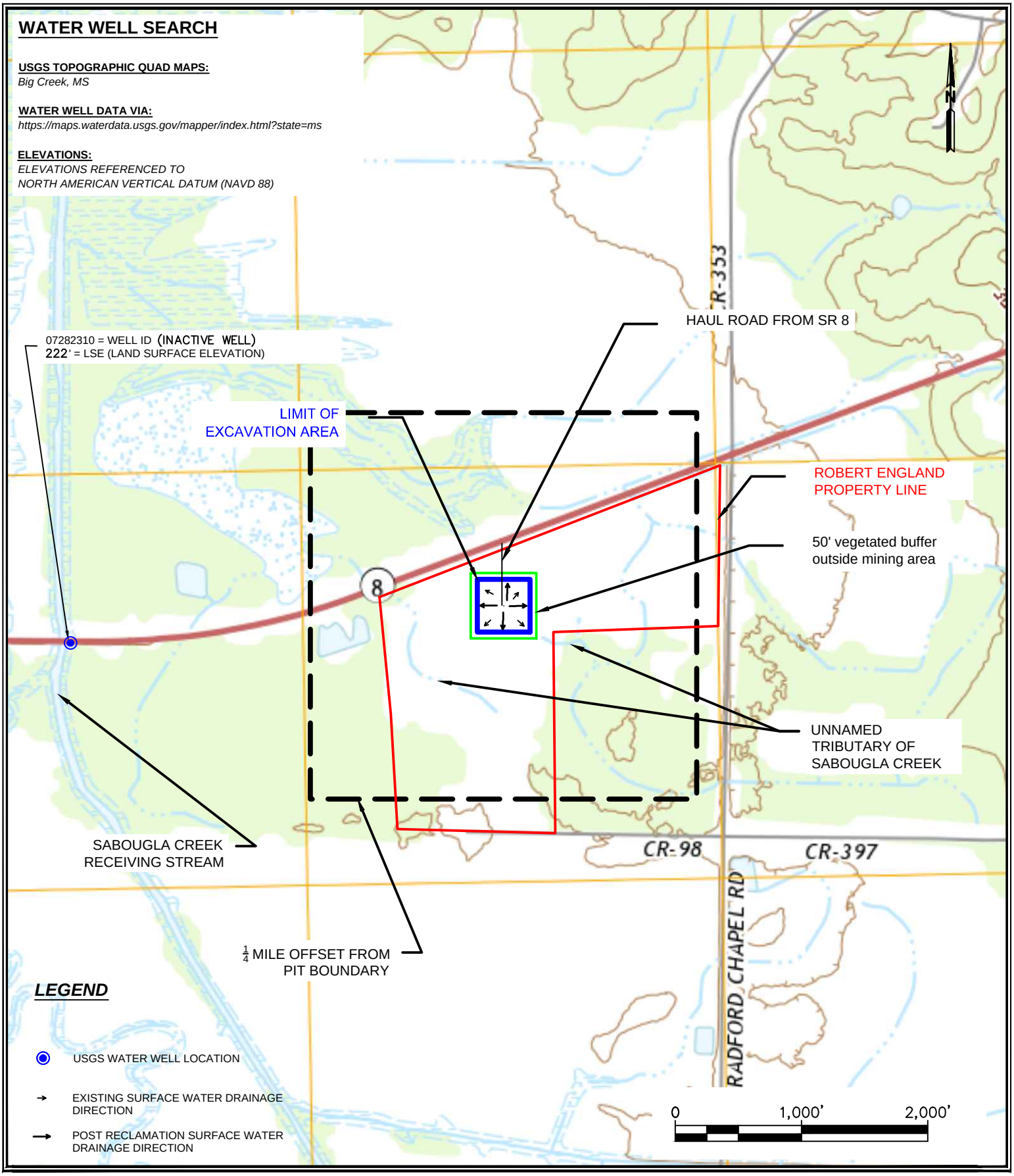
TLW, or applicable owner/operator at the time of closure, will complete a RFT of Coverage Form (See Appendix E).

WATER WELL SEARCH

USGS TOPOGRAPHIC QUAD MAPS:
Big Creek, MS

WATER WELL DATA VIA:
https://maps.waterdata.usgs.gov/mapper/index.html?state=ms

ELEVATIONS:
ELEVATIONS REFERENCED TO
NORTH AMERICAN VERTICAL DATUM (NAVD 88)



LEGEND

- USGS WATER WELL LOCATION
- EXISTING SURFACE WATER DRAINAGE DIRECTION
- POST RECLAMATION SURFACE WATER DRAINAGE DIRECTION

SHEET NO:	1
REV. / DATE	
USGS TOPO MAP	
SHEET TITLE:	
DATE:	2022/09/06
T.R.B.	
DRAWN BY:	

MDEQ

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
Chief, Environmental Permits Division
Office of Pollution Control
P.O. BOX 2261
JACKSON, MS 39225-2279

Application Destination:

England Mine
Calhoun County, MS

Project Location:

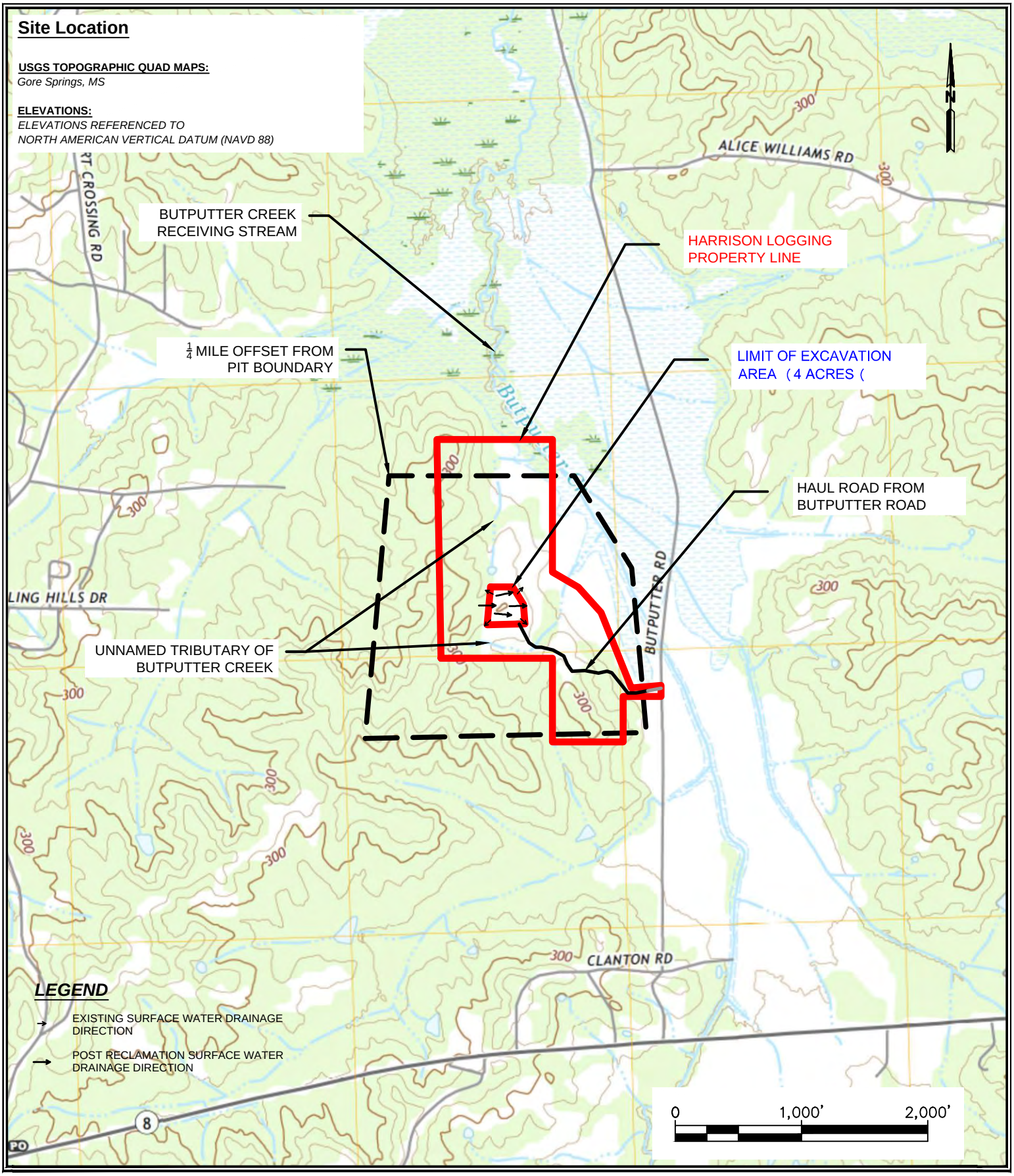
T.L. Wallace Construction
4025 Highway 35N, Columbia, MS 39429

Figures

Site Location

USGS TOPOGRAPHIC QUAD MAPS:
Gore Springs, MS

ELEVATIONS:
ELEVATIONS REFERENCED TO
NORTH AMERICAN VERTICAL DATUM (NAVD 88)



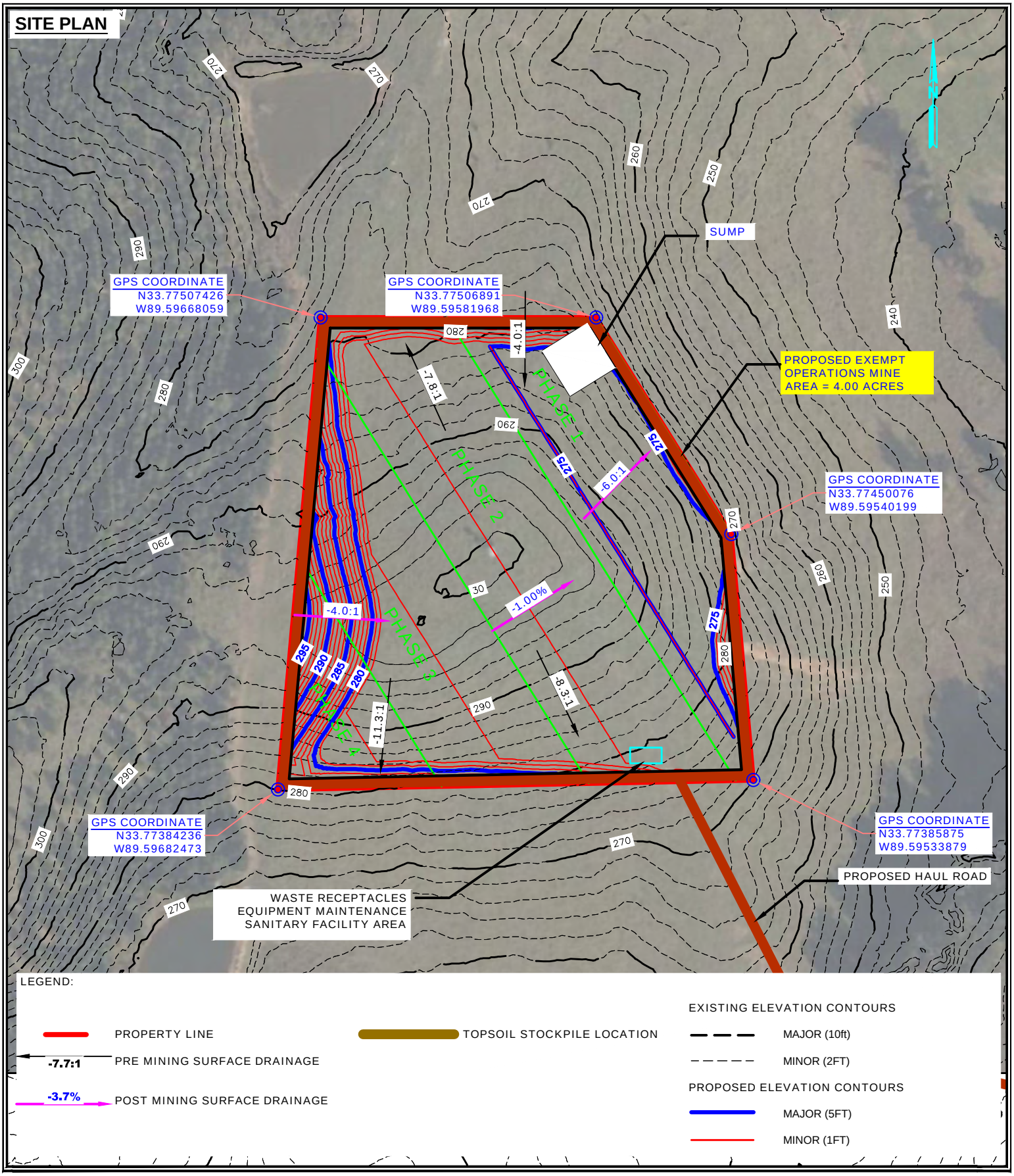
LEGEND

- EXISTING SURFACE WATER DRAINAGE DIRECTION
- POST RECLAMATION SURFACE WATER DRAINAGE DIRECTION

1	SHEET NO:	REV.	DATE	USGS TOPO MAP	SHEET TITLE:	2023/08/24	DATE:	T.R.B.	DRAWN BY:	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY Chief, Environmental Permits Division Office of Pollution Control P.O. BOX 2261 JACKSON, MS 39225

Application Destination:	Harrison Mine Grenada County, MS	Project Location:	T.L. Wallace Construction 4025 Highway 35N, Columbia, MS 39429

SITE PLAN



2	SHEET NO:	REV.	DATE	SHEET TITLE: SITE PLAN	DATE: 2023/08/24	T.R.B.	DRAWN BY:	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY Chief, Environmental Permits Division Office of Pollution Control P.O. BOX 2261 JACKSON, MS 39225	Application Destination:	Harrison Mine Grenada COUNTY, MS

Project Location:

T.L. Wallace Construction
4025 Highway 35N, Columbia, MS 39429

Appendix

Appendix A

Annual Inspection Report

COVERAGE NUMBER (MSR32 __ __ __ __) INSPECTION YEAR_____
SITE INSPECTION REPORT AND CERTIFICATION FORM
MINING GENERAL PERMIT

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Results of the inspection by ACT7 of this permit shall be recorded on this report form and in addition, copies of all completed forms shall be retained onsite or locally available. Inspections must be performed monthly and after a 2-year, 24-hour storm event (approx. 6-inches on Gulf Coast to 4-inches at MS/TN State Line). The coverage number must be listed at the top of all Site Inspection Report and Certification Forms.

COVERAGE RECIPIENT INFORMATION

COMPANY NAME: _____ MINE NAME: Harrison Logging Mine

MINE LOCATION: _____ GEOLOGY APPLICATION/PERMIT NO. _____

NEAREST PROJECT CITY: _____ COUNTY: _____

MAILING ADDRESS: _____

MAILING CITY: _____ STATE: MS ZIP: 38925

CONTACT PERSON: _____ CONTACT PHONE NUMBER: _____

INSPECTION DOCUMENTATION

DATE (mm/dd/yy)	TIME (hh:mm AM/PM)	AFTER 2-YEAR, 24-HOUR STORM EVENT? (CHECK IF YES)	ANY DEFICIENCIES? (CHECK IF YES)	INSPECTOR(S)
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	

Deficiencies Noted During any Inspection (give date(s); attach additional sheets if necessary): _____

_____

Corrective Action Taken or Planned (give date(s); attach additional sheets if necessary): _____

_____

Based upon this inspection which I or personnel under my direct supervision conducted, I certify that all erosion and sediment controls have been implemented and maintained, except for those deficiencies noted above, in accordance with the Storm Water Pollution Prevention Plan filed with the Office of Pollution Control and sound engineering practices as required by the above referenced permit. I further certify that the MNOI and SWPPP information on file with MDEQ is up to date.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

_____ _____

Authorized Signature Date

_____ _____

Printed Name Title

Appendix B

Major Modification Form

MAJOR MODIFICATION FORM FOR MINING GENERAL PERMIT

Coverage No. MSR32 __ __ __ __ County _____

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

INSTRUCTIONS

Coverage recipients shall notify the Mississippi Department of Environmental Quality of plans to expand the acreage or "footprint" of an existing mining activity or modify the existing mining operation. This form must be submitted when (check all that apply):

- ☐ **SWPPP details have been developed and are ready for MDEQ review for subsequent phases of an existing, covered mining activity**
- ☐ **"Footprint" identified in the original MNOI is proposed to be enlarged (a modified SWPPP and an updated USGS topographic map must be submitted)**
- ☐ **Mine dewatering is proposed**
- ☐ **Mine dewatering has been discontinued**
- ☐ **Closed loop wash operations are proposed**
- ☐ **Closed loop wash operations have been discontinued**

This form must be signed by the original coverage recipient under Mississippi's Mining General Permit. A different operator must have general permit coverage transferred prior to coverage being modified. Coverage recipients are authorized to discharge storm water associated with proposed expansions of dewater pits or operate a recirculation system with no discharge, under the conditions of the General Permit, only upon receipt of written notification of approval by the MDEQ. If mining activities change which will incorporate a hydraulic dredging operation or a discharge of process wastewaters to State waters additional permitting actions shall be required.

COVERAGE RECIPIENT INFORMATION

COVERAGE RECIPIENT CONTACT PERSON: _____

COMPANY NAME: _____

STREET OR P.O. BOX: _____

CITY: _____ STATE: _____ ZIP: _____

PHONE NUMBER : _____ EMAIL ADDRESS:_____

PROJECT INFORMATION

FORMER ACREAGE: _____ ADDITIONAL ACREAGE TO BE DISTURBED: _____

TOTAL ACREAGE:_____ MINE NAME: _____

GEOLOGY APPLICATION/PERMIT NO. _____ CITY: _____ COUNTY: _____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations**.**

_____ _____

Signature (must be signed by coverage recipient) Date

_____ _____

Printed Name Title

Please submit this form to:

Chief, Environmental Permits Division
MS Department of Environmental Quality, Office of Pollution Control
P.O. Box 2261
Jackson, Mississippi 39225

Appendix C

Request for Transfer of Permit

Environmental Permits for Industrial Facilities
Request for Transfer of Permit, General Permit Coverage and/or Name Change

Instructions: For Ownership Change-Complete all Items on Page 1 (except Item VIII) and Page 2 (reverse side).
For Name Change Only-Complete Items I, II, V, VI, VII, VIII, and Page 2 (reverse side).
Note-This form should be submitted to MDEQ when a transferal date is finalized but prior to the actual transfer.

Item I.

Facility Name: _____

Location: (Do Not Use P.O. Box)

Street: _____

City: _____ State: MS Zip: _____

County: _____

Telephone: __

Item II.

Responsible official after transfer or name change:

Name: _____

Title: _____

Mailing Address:
Street/P.O. Box: _____

City: _____ State: _____ Zip: _____

Telephone ___

Item III.

Previous Permittee[1]: _____

Mailing Address:

Street/P.O. Box:_____

City: _____ State: _____ Zip: _____

Telephone: _

Item IV.

New Permittee[1]: _____

Mailing Address:

Street/P.O. Box:_____

City: _____ State: _____ Zip: _____

Telephone: _

Item V.

Industrial Activity SIC Code: _____

Brief Description:

Item VI.

Will Facility Operations Change? Yes ☐ No ☐

If yes, the appropriate applications and permits may require modification prior to change.

Item VII.

Will Facility Name Change? Yes ☐ No ☐

If Yes, Provide New Name for Permit Coverage.

New Name:_____

Item VIII.

Signature for Name Change

Print Name: _____

Authorized Signature[2]: _____

Title: _____ Date: _____

Item IX.

We the undersigned request transfer of permit(s) and/or permit coverage(s) listed on the backside of this form.

From:_____

To:_____ Acquisition Date:_____

By signature below, the recipient certifies that: 1) they are aware of the requirements of the permit(s), 2) the applicant can demonstrate to the Permit Board it has the financial resources and operational expertise and 3) agrees to accept responsibility and liability for the permit(s) listed on the back of this document. By signature below, the previous permittee is requesting that the permit(s) and/or permit coverage(s) be transferred to the recipient. The transfer of the permit(s) or permit coverage(s) will be by written notification from the Office of Pollution Control (OPC). The OPC may require submittal of information regarding financial capability and past compliance history of the recipient.

_____ _____

Print New Permittee[1] Name Print Previous Permittee[1] Name

_____ _____

New Authorized Signature[2] Previous Authorized Signature[2]

_____ _____ _____ _____

Title Date Title Date

[1]A Permittee is a company or individual that has been issued an individual permit or coverage under a general permit.
[2]Authorized Signature must be owner or in the case of a corporation, a corporate officer as defined in Regulations APC-S-2 and WPC-1.

Mississippi Department of Environmental Quality/Office of Pollution Control
P.O. Box 2261
Jackson, Mississippi 39225
(601) 961-5171

Item X. Storm Water

(Check One)

☐ A Storm Water Pollution Prevention Plan (SWPPP) is not required for the site.

☐ The recipient certifies that they have received a copy of the Office of Pollution Control approved SWPPP from the original owner.

☐ The recipient is submitting a new SWPPP, which is attached to this form.

☐ A copy of the SWPPP cannot be obtained from the original owner.

Item XI. Hazardous Waste ID Number

EPA ID No. ______________________________

(Check One)

☐ An EPA Hazardous Waste ID Number is not required for the site.

☐ The site's EPA ID Number is listed above and a Notification of Regulated Waste Activity Form is attached.

Item XII. Permit(s) and/or Coverage(s) to be Transferred

Permit Type: ______________________________
Permit/Coverage No.: ______________________________
Permit Issuance Date: ______________________________
Date of General Permit Coverage: ________________
Permit Expiration Date: ______________________________

Permit Type: ______________________________
Permit/Coverage No.: ______________________________
Permit Issuance Date: ______________________________
Date of General Permit Coverage: ________________
Permit Expiration Date: ______________________________

Permit Type: ______________________________
Permit/Coverage No.: ______________________________
Permit Issuance Date: ______________________________
Date of General Permit Coverage: ________________
Permit Expiration Date: ______________________________

Permit Type: ______________________________
Permit/Coverage No.: ______________________________
Permit Issuance Date: ______________________________
Date of General Permit Coverage: ________________
Permit Expiration Date: ______________________________

Permit Type: ______________________________
Permit/Coverage No.: ______________________________
Permit Issuance Date: ______________________________
Date of General Permit Coverage: ________________
Permit Expiration Date: ______________________________

Permit Type: ______________________________
Permit/Coverage No.: ______________________________
Permit Issuance Date: ______________________________
Date of General Permit Coverage: ________________
Permit Expiration Date: ______________________________

Permit Type: ______________________________
Permit/Coverage No.: ______________________________
Permit Issuance Date: ______________________________
Date of General Permit Coverage: ________________
Permit Expiration Date: ______________________________

OTHER INFORMATION:

Appendix D

Training Records

Appendix E

Request for Termination of Coverage

Request for Termination (RFT) of Coverage

Mining General NPDES Permit No. MSR32 __ __ __ __ County Grenada

(Fill in your Certificate of Coverage Number and County)

Use this form to request coverage termination only after mining activities have permanently stopped and permanent erosion and sediment controls are successfully established. Inspections must continue until the coverage recipient receives written notice of coverage termination by MDEQ.

Please check which of the following apply:

☐ **Non-Exempt Mining Operation (copy of Permit Board Order, authorizing 90% or final release of mining performance bond attached)**

☐ **Exempt Mining Operation (as defined in MDEQ's Mississippi Surface Mining and Reclamation Rules and Regulations)**

(Please Print or Type)

Facility Name: _____ Closure Date: _____

Physical Site Street Address (if not available, indicate nearest named road): _____

_____

City: Gore Springs _____ County: _____

Landowner Company Name: _____

Landowner Company Contact Name and Position: _____

Street Address / P.O. Box: _____

City: _____ State: MS _____ Zip: _____

Tel. # (_____) _____

Operator Company Name (if different than owner): _____

Operator Contact Name and Position: _____

Street/ Address / P.O. Box: _____

City: _____ State: _____ Zip: _____

Tel. # (662) 515-7037

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. I understand that by submitting this Request for Termination and receiving written confirmation, I will no longer be authorized to discharge storm water associated with industrial activity under this general permit. Discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Request for Termination does not release an owner or operator from liability for any violations of this permit or the Clean Water Act.

_____	_____	_____	_____
Authorized Name (Print)	Telephone	Signature	Date Signed

[1]This application shall be signed according to the General Permit, ACT 15, T-4 as follows:

- For a corporation, by a responsible corporate officer.
- For a partnership, by a general partner.
- For a sole proprietorship, by the proprietor.
- For a municipal, state or other public facility, by principal executive officer, mayor, or ranking elected official.

After signing please mail to: Environmental Permits Division, Office of Pollution Control
P.O. Box 2261
Jackson, MS 39225

Revision: 2/16/2018

Appendix F

Notice of Exempt Operations Application

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF GEOLOGY
Mining and Reclamation Division
P. O. Box 2279
Jackson, Mississippi 39225-2279
(601) 961-5515

NOTICE OF EXEMPT OPERATION

This form shall be filed with the Office of Geology, Mining and Reclamation Division **only** for operations affecting **4** acres or less *and* **greater** than **1320** feet from another mine. **NOTE**: Local, county, federal or other state agencies may also require permits before mining can be done on your site. This is *your* responsibility.

Name of applicant/operator: TL Wallace Construction, Inc.
Mailing address: 4025 Highway 35N
Columbia, MS 39429
Telephone number: 601-441-6434

Do you have any **other** exempt mining operations on file? [x] yes [ ] no
Do you plan to file for a **permit** and expand this site later? [ ] yes [x] no

LOCATION

SE 1/4 of NE 1/4 of Section 18, Township 22N Range 7E County Grenada

Include a map or aerial photo marked with site location with this form.

Name of land owner: Kevin Harrison
Mailing address: P.O. Box 336
Duckhill, MS 38925
Telephone number 662-515-7037

Date operation to begin August, 21 2023 Date operation to end (estimated) March, 21 2025
Material to be mined General Fill Number of acres to be mined 4 (A)*
Total acres to be affected by operation (mine, roads, storage, etc.) 4 (B)*
Is operation **closer** than 1,320 feet (1/4 mile) to another mine? [x] no [ ] yes*

***If items A or B exceed 4 acres or you answered YES above, you need to apply for a MINING PERMIT.**

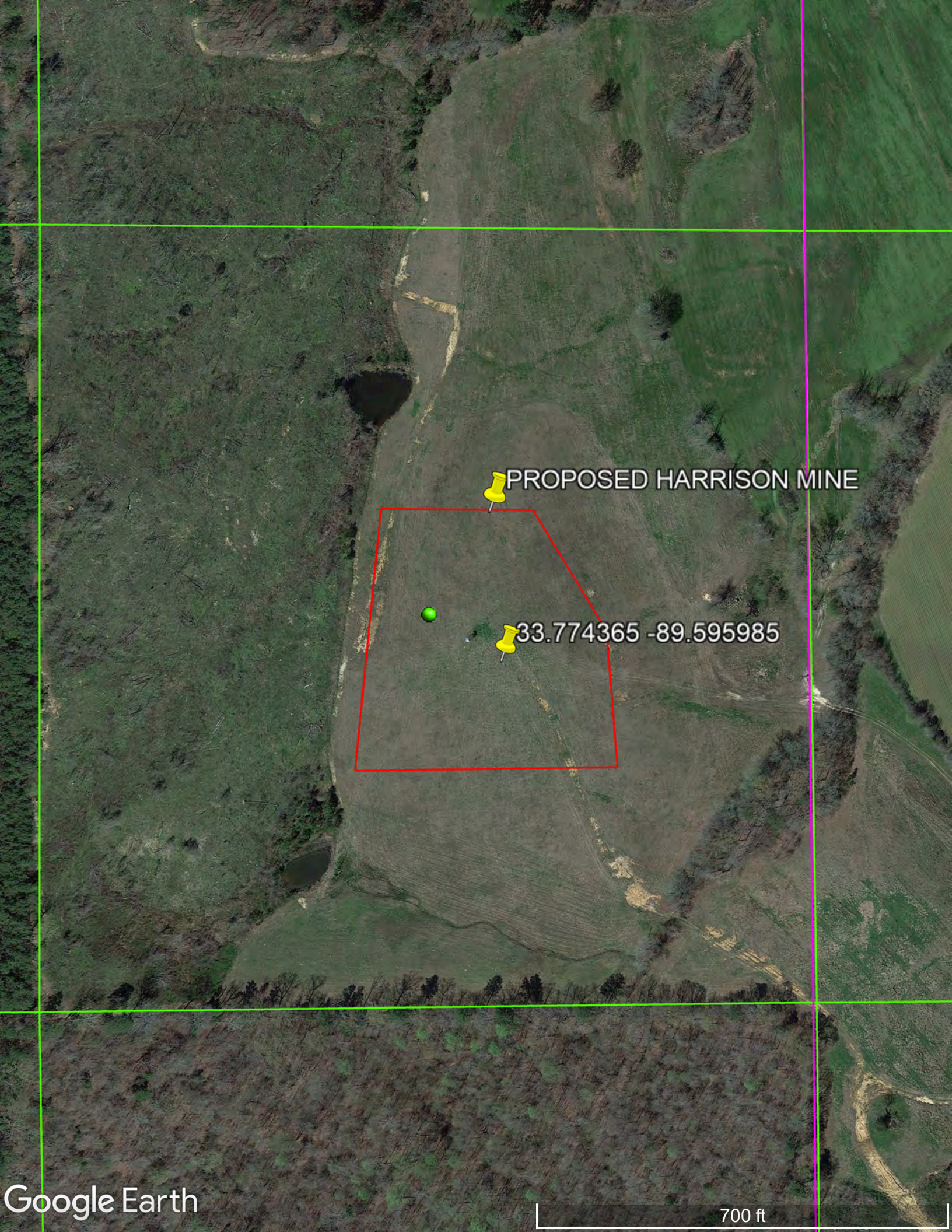
Applicant/operator: TL Wallace Construction, Inc. By _____
Signature

Date: 2023 August 17, Position Vice President

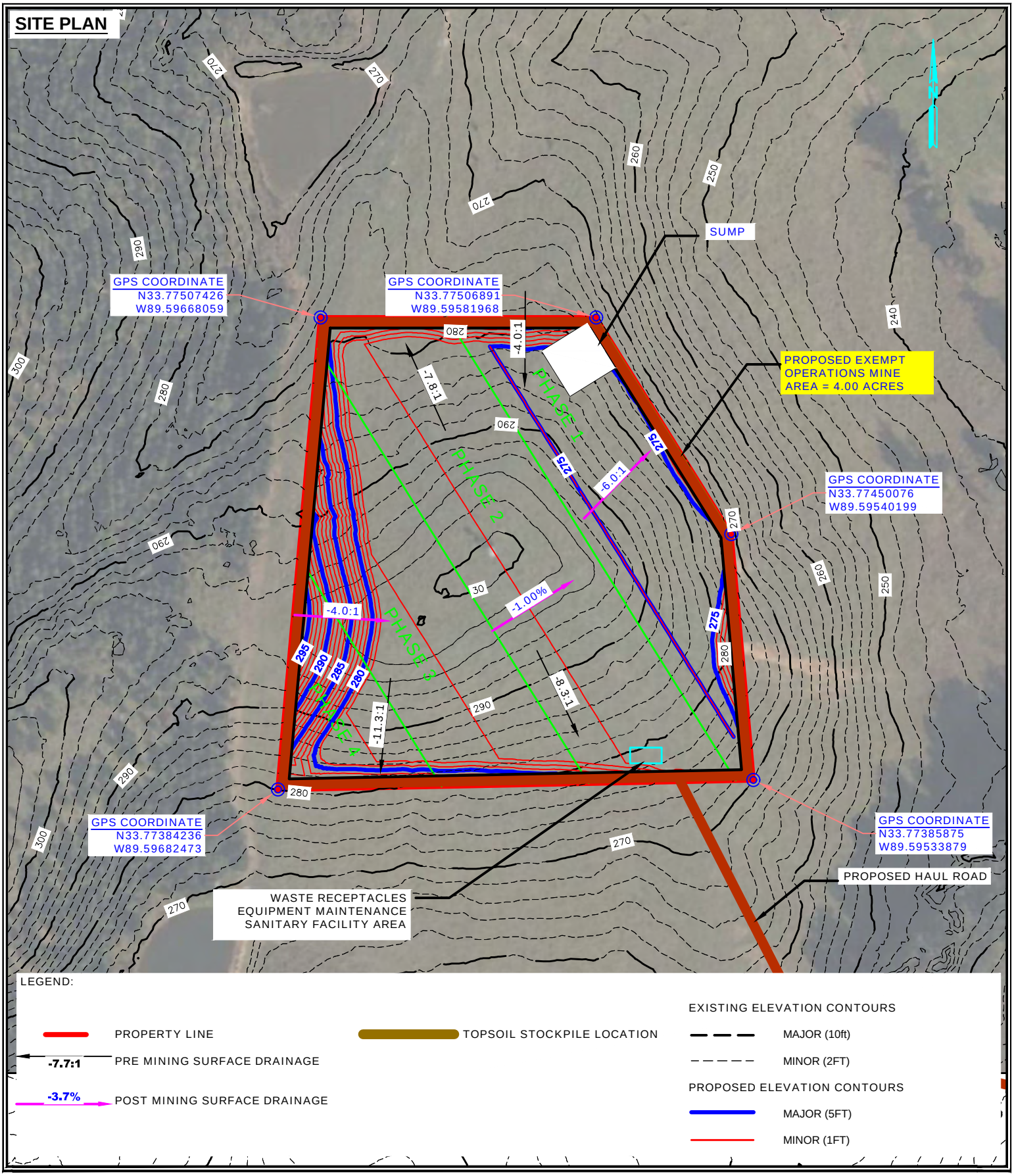
For Office of Geology use only

Date: _____ By _____
Division Director
Mining and Reclamation Division

Form MRD- 9 rev. 08/05


PROPOSED HARRISON MINE
33.774365 -89.595985
Google Earth
700 ft

SITE PLAN



2	SHEET NO:	REV.	DATE	SHEET TITLE: SITE PLAN	DATE: 2023/08/24	T.R.B.	DRAWN BY:	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY Chief, Environmental Permits Division Office of Pollution Control P.O. BOX 2261 JACKSON, MS 39225	Application Destination:	Harrison Mine Grenada COUNTY, MS

Project Location:

T.L. Wallace Construction
4025 Highway 35N, Columbia, MS 39429

225.03.4.1.1--Equipment. Mulching equipment should be capable of maintaining a constant air stream that will blow or eject controlled quantities of mulch in a uniform pattern.

Mulch stabilizers should consist of dull blades or disks without camber and approximately 20 inches in diameter. The disks should be notched, should be spaced at approximately 8-inch intervals, and should be equipped with scrapers. The stabilizer should weigh approximately 1000 to 1200 pounds, should have a working width of no more than eight feet, and should be equipped with a ballast compartment, so that weight can be increased.

225.03.4.1.2--Placement of Vegetative Mulch. Mulching should be placed uniformly on designated areas within 24 hours following seeding unless weather conditions are such that mulching cannot be performed. Placement should begin on the windward side of areas and from tops of slopes. In its final position, the mulch should be loose enough to allow air to circulate but compact enough to partially shade the ground and reduce erosion.

The baled material should be loosened and broken thoroughly before it is fed into the machine to avoid placement of unbroken clumps.

225.03.4.1.3--Anchoring Mulch. The mulch should be anchored by using a mulch stabilizer when not hydraulically applied. If a mulch stabilizer is used, the mulch should be punched into the soil for a minimum depth of one inch.

When mulch stabilizers are used, anchoring the mulch should be performed along the contour of the ground surface.

225.03.4.2--Hydromulch. Hydromulch shall be applied in accordance Subsection 215.03.5.

225.03.5--Vegetation Schedule. When a vegetation schedule is not shown in the plans or when the contract does not have an official set of plans, the following application rates shall be used, unless otherwise noted or approved by the Engineer.

Agricultural Limestone	1,000 pounds per acre	March 1 to September 1
13-13-13 Commercial Fertilizer	250 pounds per acre	March 1 to September 1
Vegetative Materials	2 tons per acre	
Bermudagrass	80 pounds per acre	March 1 to September 1
	20 pounds per acre	September 1 to March 1 *
Bahiagrass	80 pounds per acre	March 1 to September 1
	25 pounds per acre	September 1 to March 1
Tall Fescue	25 pounds per acre	March 1 to September 1
	100 pounds per acre	October 1 to March 1 **
Sericea Lespedeza	25 pounds per acre	March 1 to September 1
	25 pounds per acre	September 1 to March 1
Crimson Clover	20 pounds per acre	August 1 to April 1

* 80 pounds per acre in District 3 Delta

225.04--Method of Measurement. Grassing will be measured by the acre. Acceptance will be based on a satisfactory growth and coverage of seeds planted.

Acceptable quantities of agricultural limestone will be measured by the ton.

Acceptable quantities for mulch will be measured by the ton. For vegetative mulch, the weight for measurement will be the product of the number of bales acceptably placed and the average weight per bale as determined on approved scales provided by the Contractor. Anchoring of vegetative mulch will not be measured for separate payment. The cost of anchoring shall be absorbed in the prices bid for other items of work. For hydromulch, the weight for measurement will be the dry weight of the packaged fibers used in the mixture. No payment will be allowed for water, additives, tackifier, or other liquids used in the mixture.

225.05--Basis of Payment. Grassing, measured as prescribed above, will be paid for at the contract unit price per acre, which will be full compensation for all required materials including seeding and fertilizers other than limestone, ground preparation, equipment, labor, testing and all work necessary to establish a satisfactory growth of grass.

Hard rock agricultural limestone will be paid for at the contract unit price per ton. Hard rock agricultural limestone with a relative neutralizing value (RNV), determined in accordance with Subsection 715.02.2.1.3, of between 60.0% and 62.9% will be paid for at half (½) the contract unit price per ton. No payment will be made for hard rock agricultural limestone with an RNV less than 60.0%.

Mulch, measured as prescribed above, will be paid for at the contract unit price per ton, which price shall be full compensation for all materials, equipment, labor, and incidentals necessary to complete the work.

Payment will be made under:

225-A:	Grassing	- per acre
225-B:	Agricultural Limestone	- per ton
225-C:	Mulch, Vegetative Mulch	- per ton
225-D:	Mulch, Hydromulch	- per ton

SECTION 226 - TEMPORARY GRASSING

226.0l--Description. This work consists of furnishing, transporting, placing, plant establishment and all work necessary to produce rapid-growing grasses, grains or legumes to provide an initial, temporary cover of grass. This work includes ground preparation, fertilizing, seeding and mulching necessary to establish a satisfactory growth of temporary grass. The Contractor may elect to place temporary grassing using the hydroseeding method as set out in Section 227.

Appendix G

Department of Interior - Fish and Wildlife -Threatened and Endangered Species Review

From:	Bart Pittman
To:	Tracy Bedwell
Subject:	[EXTERNAL SENDER] Fwd: Fw: [EXTERNAL] Fwd: Request for project review, proposed pit site Grenada County
Date:	Saturday, August 19, 2023 4:40:04 PM
Attachments:	PittmanLtr_8-2-23.pdf PittmanInvoice_8-19-23.pdf

---

Tracy,

See the USFWS response email below, my invoice is attached. Thanks!

---------- Forwarded message ---------
From: **Ruppel, Ashley S** <ashley_s_ruppel@fws.gov>
Date: Fri, Aug 18, 2023 at 8:23 AM
Subject: Fw: [EXTERNAL] Fwd: Request for project review, proposed pit site Grenada County
To: Bart Pittman <bartpittman@gmail.com>

Hello Bart,

The Service has reviewed your threatened and endangered species evaluation and, due to the lack of tree clearing required for the project, has determined that the proposed project is 'not likely to adversely affect' the endangered Northern Long-eared Bat.

At this time neither the Alligator Snapping Turtle nor the Monarch Butterfly receive federal protections under the Endangered Species Act (ESA), so ESA Section 7 consultation is not required for either of these species.

As a best management practice, the Service recommends implementing erosion control measures to prevent sediment runoff which may travel during heavy rainfall towards nearby Butputter Creek.

Please let me know if you have additional questions, or if a formal letter is needed to complete your request.

Best,

Ashley Seagroves Ruppel
Aquatic Biologist
Mississippi Ecological Services Field Office
U.S. Fish and Wildlife Service
6578 Dogwood View Pkwy, Jackson, MS 39213
601.321.1126 office
830.832.6358 cell
ashley_seagroves@fws.gov
(She/Her/Hers)

From: Campbell, Tamara N <tamara_campbell@fws.gov>
Sent: Friday, August 18, 2023 7:58 AM
To: Ruppel, Ashley S <ashley_s_ruppel@fws.gov>
Subject: Fw: [EXTERNAL] Fwd: Request for project review, proposed pit site Grenada County

Ashley,

Please follow up with Bart regarding this project in Grenada Co. Let me know if you need anything.

Thanks,
TC

Tamara Campbell
Fish & Wildlife Biologist
U.S. Fish and Wildlife Service
6578 Dogwood View Parkway
Jackson, MS 39213
Office: (601) 321-1138
Email: tamara_campbell@fws.gov

From: Bart Pittman <bartpittman@gmail.com>
Sent: Friday, August 18, 2023 7:37 AM
To: Campbell, Tamara N <tamara_campbell@fws.gov>; MSFOSection7Consultation, FW4 <msfosection7consultation@fws.gov>
Subject: [EXTERNAL] Fwd: Request for project review, proposed pit site Grenada County

Tamara,

See below and attached, I just wanted to make sure this request got received. Thanks!

---------- Forwarded message ---------
From: **Bart Pittman** <bartpittman@gmail.com>
Date: Wed, Aug 2, 2023 at 2:58 PM
Subject: Request for project review, proposed pit site Grenada County
To: <msfosection7consultation@fws.gov>, Tracy Bedwell <tbedwell@tlwallace.com>

Please see the attached letter with project location maps, we need a review of this site.
Please let me know if anything is needed.

Thank you!

--
Bart Pittman
Pittman Environmental Services, LLC
601-297-2487

--
Bart Pittman
Pittman Environmental Services, LLC
601-297-2487

--
Bart Pittman
Pittman Environmental Services, LLC
601-297-2487

Pittman Environmental Services, LLC
P.O. Box 1926 ▪ Purvis, MS 39475 ▪Phone: 601-297-2487

August 2, 2023

U.S. Fish and Wildlife Service
Mississippi Field Office
6578 Dogwood View Parkway, Suite A
Jackson, Mississippi 39213

RE: Threatened & Endangered Species Evaluation
Proposed Butputter Road Pit Site
Grenada County, MS
Wallace Construction Company Inc.

Sir/Madam:

At the request of Wallace Construction Company Inc., a threatened and endangered species evaluation has been conducted for a ±9.57-acre proposed pit location near Butputter Road within Grenada County. The exact location and limits of the site is depicted within the attached maps. Wallace Construction Company Inc. requested that the subject property be evaluated in accordance with the Endangered Species Act (87 Stat. 884; as amended; 16 U.S.C. 1531 et seq.).

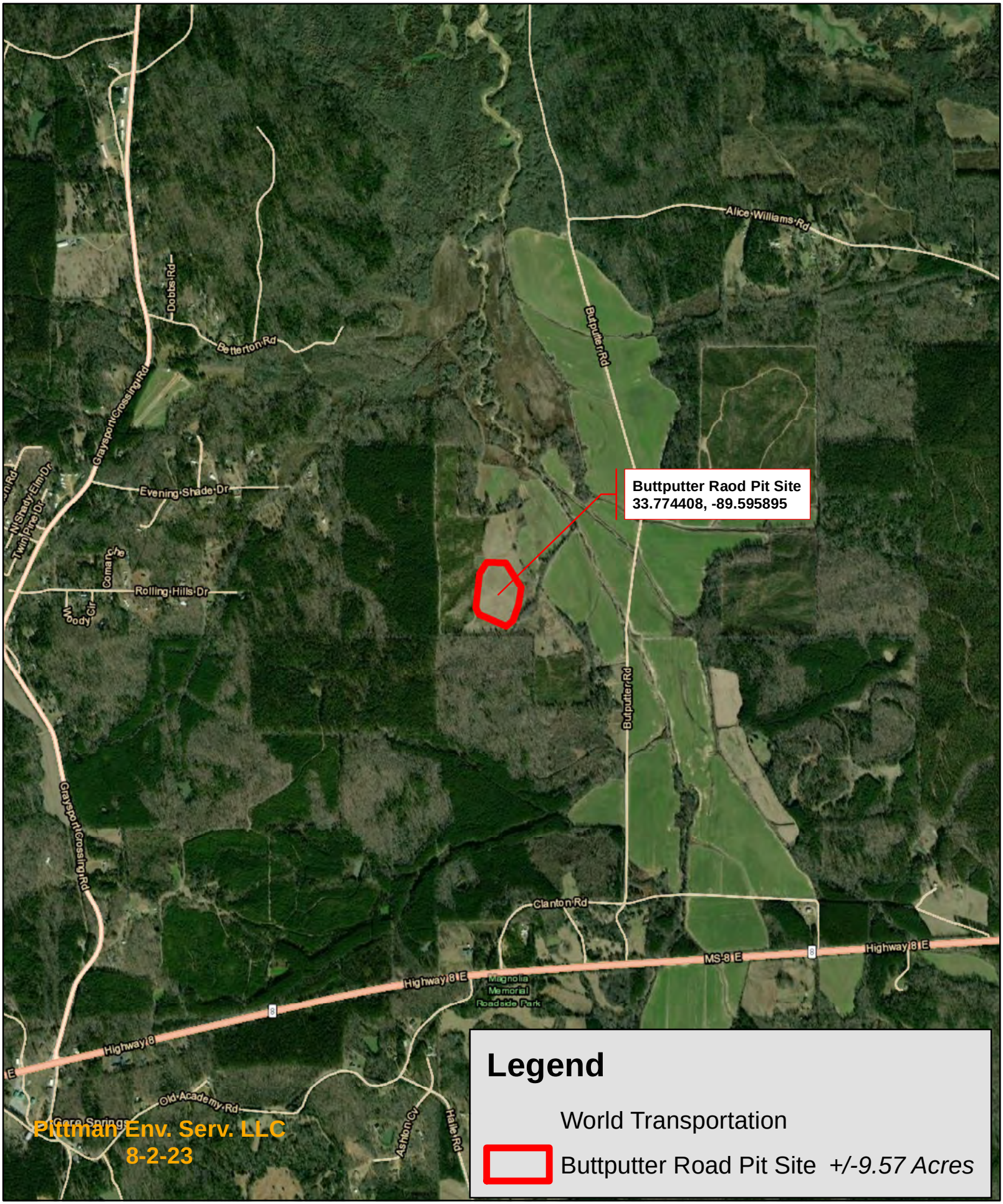
The IPac resource list indicated three species that could potentially occur within the vicinity of the project area, the Northern Long-eared Bat (NLEB), Alligator Snapping Turtle, and the Monarch Butterfly. The desktop evaluation of this project indicates that no potential habitat exists within the property for the listed species. The site is comprised of pasture that is used for cattle grazing and hay cutting. No trees or potential NLEB habitat exist within the site. No stream or water body is located within the site to support the Alligator Snapping Turtle. The grazing of the site and cutting of hay prevents suitable habitat (milkweed) to support the Monarch Butterfly.

On behalf of Wallace Construction Company Inc. I am requesting this site be reviewed by your office. If additional information is needed or if your office would like to schedule a site visit, please contact me at (601) 297-2487.

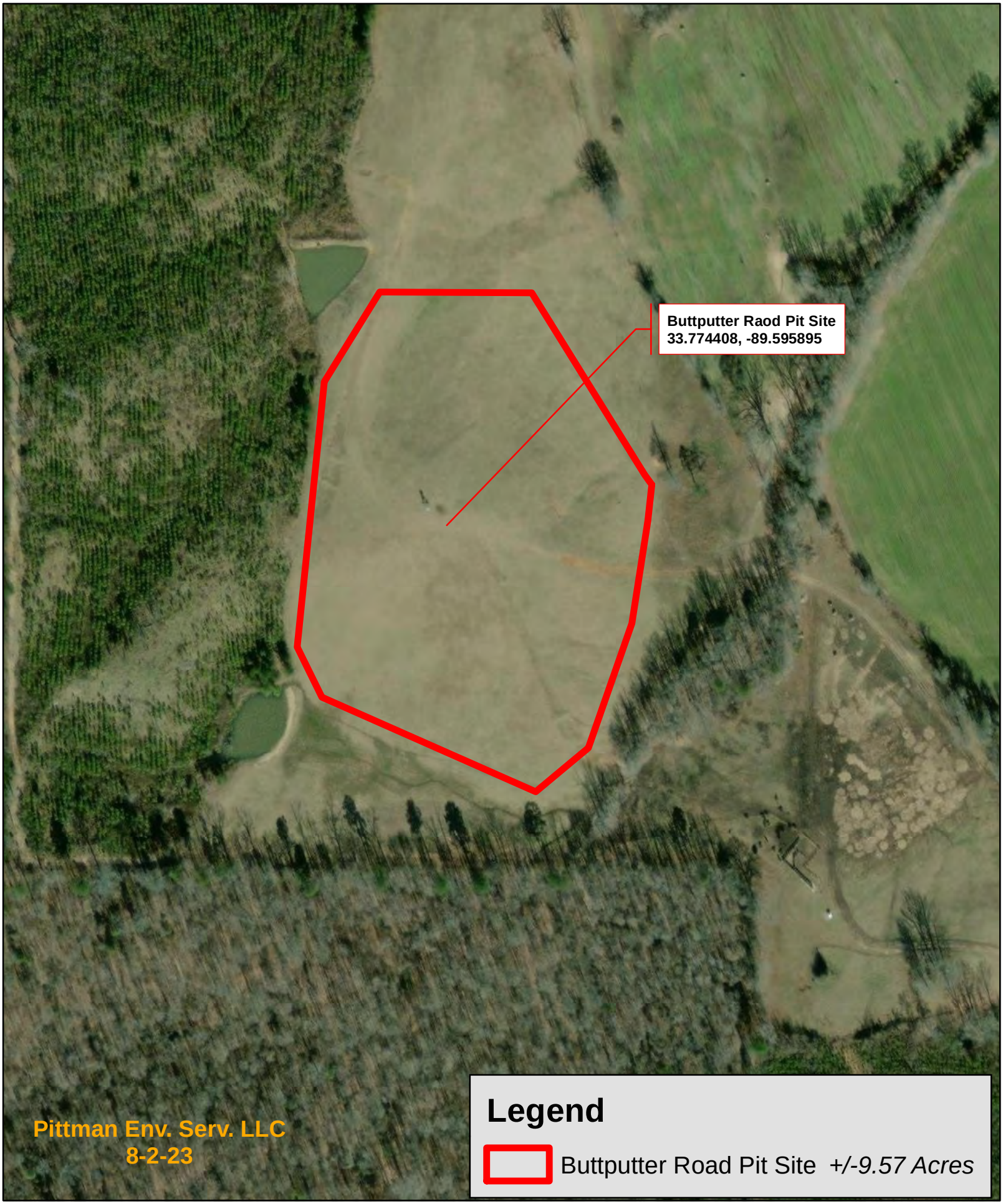
Sincerely,

Bart A. Pittman
Environmental Specialist
Pittman Environmental Services, LLC

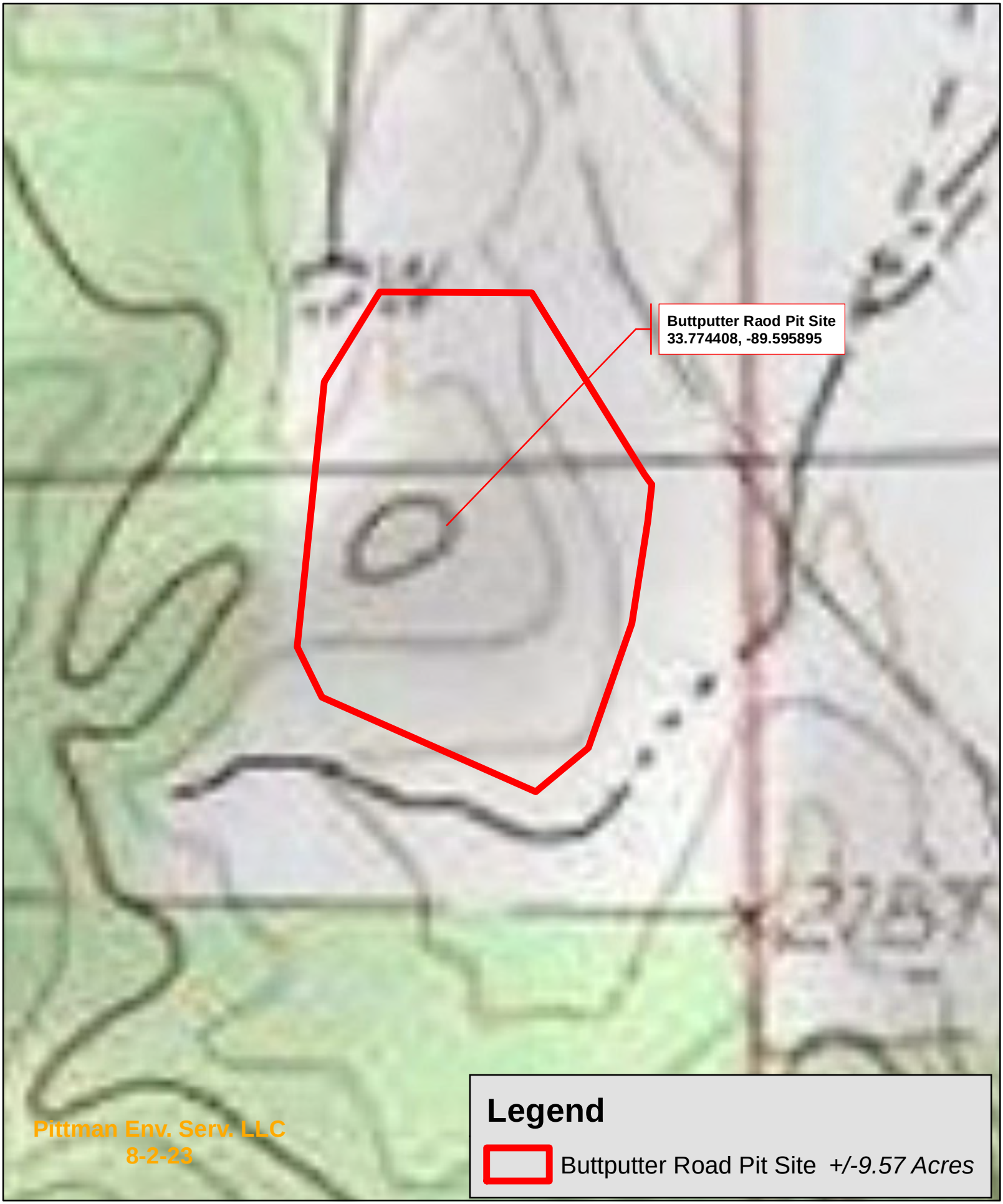
T&E Species Survey for Proposed Pit Site
Butputter Road, Grenada County
TL Wallace Construction, Inc.



T&E Species Survey for Proposed Pit Site
Butputter Road, Grenada County
TL Wallace Construction, Inc.



T&E Species Survey for Proposed Pit Site
Butputter Road, Grenada County
TL Wallace Construction, Inc.



Appendix H

MS Department of Archives and History – Letter of Concurrence

And Cultural Resources Report

All Phases Archaeology

August 22, 2023

A PHASE I CULTURAL RESOURCES SURVEY FOR THE BUTPUTTER 2 DIRT PIT GRENADA COUNTY, MISSISSIPPI

Prepared for:
TL Wallace Construction, Inc.
4025 Highway 35 North
Columbia, Mississippi 39429

Prepared by:
All Phases Archaeology, LLC
257 Pinehill Drive
Mobile, Alabama 36606

All Phases Archaeology, LLC
www.allphasesarchaeology.com

A PHASE I CULTURAL RESOURCES SURVEY FOR THE BUTPUTTER 2 DIRT PIT GRENADA COUNTY, MISSISSIPPI

Prepared by

All Phases Archaeology, LLC

257 Pinehill Drive

Mobile, Alabama 36606

Prepared for

TL Wallace Construction, Inc.

4025 Highway 35 North

Columbia, Mississippi 39429

Principal Investigator

William J. Glass, RPA

APA Report No. 2023.149

MDAH Project Log No. 08-117-23

Lead Agency: Mississippi Department of Environmental Quality

August 22, 2023

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A PHASE I CULTURAL RESOURCES SURVEY FOR THE BUTPUTTER 2 DIRT PIT GRENADA COUNTY, MISSISSIPPI

INTRODUCTION

All Phases Archaeology, LLC (APA) of Mobile, Alabama was contracted by TL Wallace Inc. of Columbia, Mississippi to conduct a cultural resources survey for the proposed Butputter 2 dirt pit project in Grenada County, Mississippi. The Phase I survey was performed on August 21, 2023. William J. Glass served as Principal Investigator and was assisted by William Henry. The purpose of this study was to determine if any cultural resources exist within the limits of the survey tract and, if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Mississippi Department of Environmental Quality (MDEQ) is the lead agency. The Mississippi Department of Archives and History (MDAH) requested this survey and the request letter can be found in Appendix A. The dirt removed from the pit will be used as fill for a bridge replacement on SR 8 over Butputter Creek.

The proposed Butputter 2 dirt pit encompasses approximately 9.5 acres and is located north of SR 8 and west of Butputter Road in Gore Springs, Mississippi (Figure 1). The project area can be found on the Gore Springs, Mississippi, USGS 7.5' series topographic quadrangle in Section 18, Township 22 North, Range 7 East (Figure 2). Photographs depicting the present state of the land within the project area are provided (Figures 3-8).

PROJECT AREA ENVIRONMENT

Grenada County is drained by the Yalobusha River and its tributaries. The county can be divided into three physiographic areas that extend from north to south across the county. From west to east, they are the Mississippi River alluvial plain, the loessal hills, and that part of the Coastal Plain east of the hills (Thomas and Bowen 1967). The survey tract is located within the Mississippi Valley Loess Plains ecoregion, consisting of irregular plains, gently rolling hills, and bluffs near the Mississippi River. The ecoregion is characterized by thick loess, a wind-blown mixture of silt with fine sand and clay that originated in the Pleistocene. Natural vegetation of oak-hickory, oak-hickory-pine, and mixed mesophytic forest was supplanted by cropland. Much of the area now is in pine plantations and mixed forest (Chapman et al. 2004).

According to the Web Soil Survey (2023), there are four soil types in the survey area (Table 1). Over 40 percent of the soil there is gullied land (Thomas and Bowen 1967).

CULTURAL HISTORY

Paleoindian Period

Initial human occupation in the southeastern United States has generally thought to have occurred between 13,000 and 9,000 B.C. (Anderson et al. 1996), although the dates continue to be pushed back further in time with new discoveries. The first evidence of human occupation in the southeastern United States occurs in the form of lithic tool assemblages found in stratified deposits. The Paleoindian Period in Mississippi is distinguished by the occurrence of a distinctive tool kit and projectile point types such as Clovis, Redstone, and Cumberland. Little is known about Paleoindian populations in Mississippi as sites of this time period are often defined by surface finds or isolated artifacts found during the excavation of later sites.

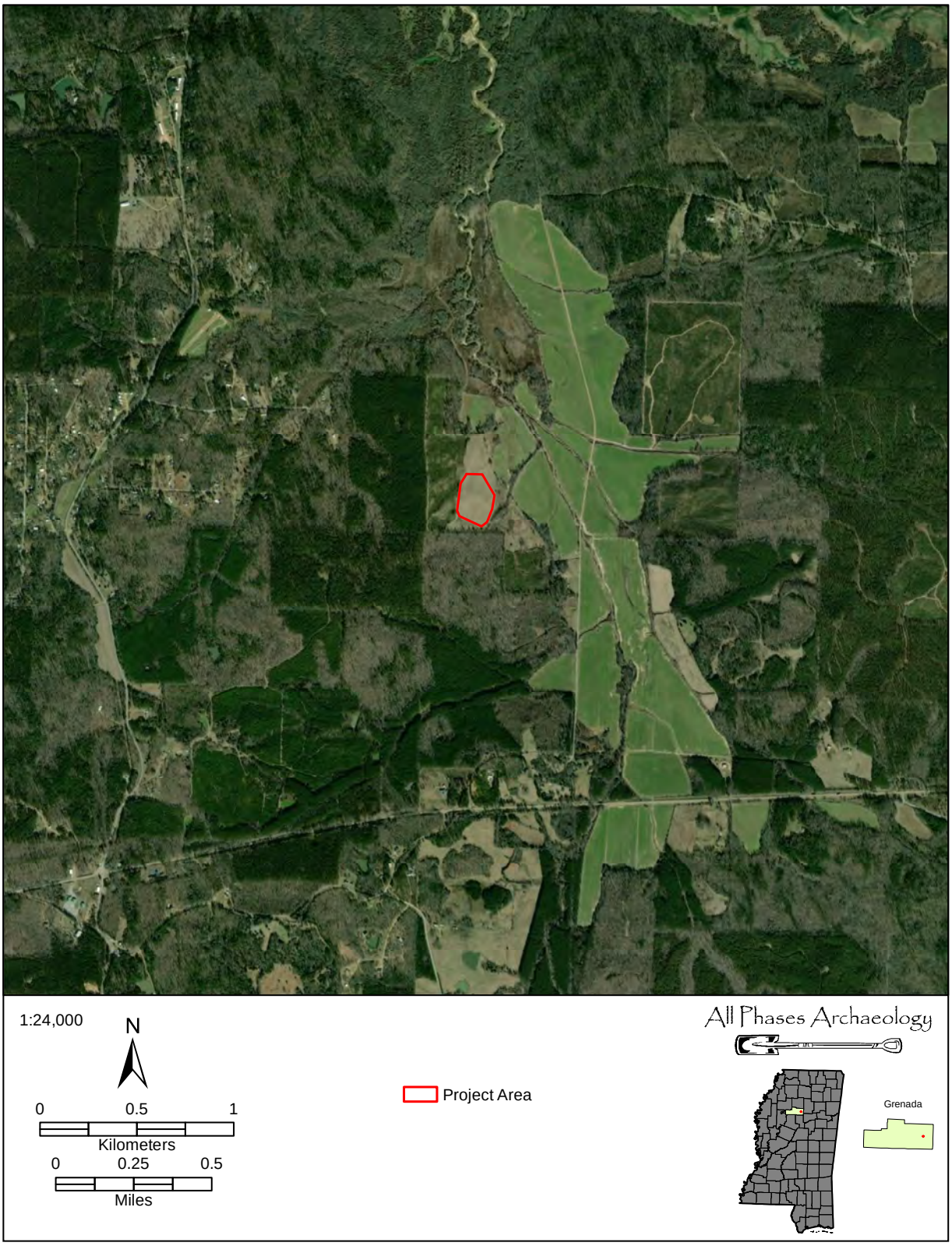

Figure 1. *Aerial showing the project area.*

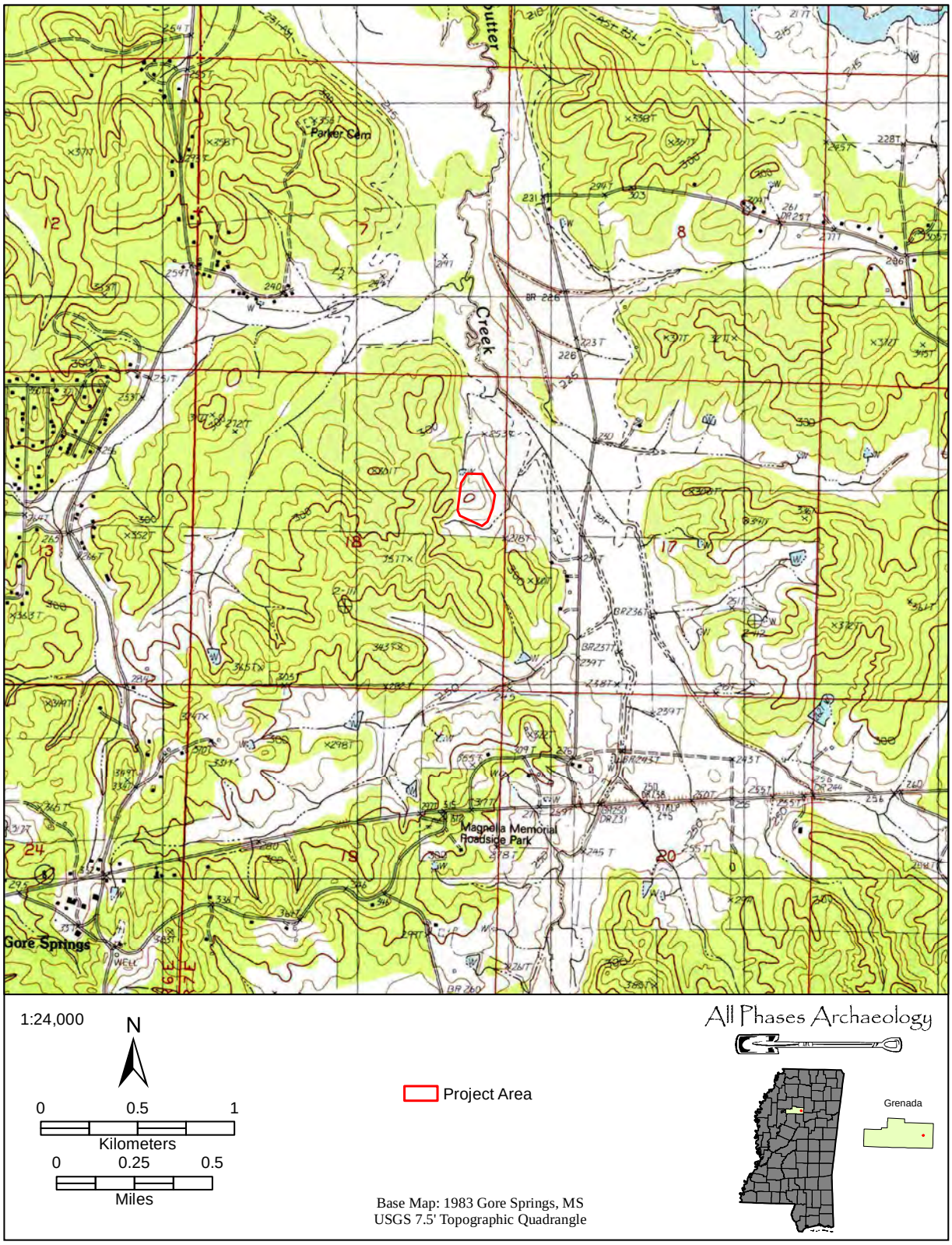

Figure 2. *Map showing the project area.*

Figure 3. *View from center of survey area, facing north.*

Figure 4. *View from center of survey area, facing south.*

Figure 5. *View from center of survey area, facing west.*

Figure 6. *View of deer stand from center of survey area, facing east.*

Figure 7. *View of soil disturbance near center of survey area, facing south.*

Figure 8. *View of access road, facing west.*

Table 1. Soil types within the project area.			
Soil Symbol	**Soil Name and Description**	**Acres in Project Area**	**Percent of Project Area**
Ff	Falaya silt loam - somewhat poorly drained, on bottomlands, mainly in cultivated crops or pasture	0.7	7.7%
Gt	Gullied land, sandy - eroded to the point that in most places the soil profile is destroyed	4.0	42.4%
RcF	Ruston-Cuthbert association, hilly - moderately well drained, on steep sideslopes and narrow ridgetops, most in pine and hardwood forest	4.7	49.5%
TbD2	Tippah-Boswell complex, 8 to 12 percent slopes, eroded - well drained, on uplands, most in pasture	0.0	0.4%
Totals for Project Area		**9.5**	**100.0%**

The Paleoindian Period has been divided into three temporal subperiods (Early, Middle, and Late) based on archaeologically distinct trends in technological and/or organizational development in the Southeast. In Mississippi, these periods date to: Early (10,000-9,000 B.C.), Middle (9,000-8,500 B.C.), and Late (8,500-7,900 B.C.) (McGahey 2000). Changes in point morphology reflect different cultural/temporal adaptations to the regional environment; therefore subperiod occupations are predominately distinguished by the appearance of specific diagnostic projectile point/knife types.

ARCHAIC PERIOD

The Archaic Period in the eastern United States is dated approximately between 8,000 and 1,000 B.C. During this broad time span, prehistoric cultures in the eastern United States were adapting to the emergent Holocene environment and experiencing significant population increases. Changes in the environment and population density had a significant impact on social dynamics, and are reflected in the archaeological record. A more varied assortment of artifact types, and a broader array of artifact attributes, is interpreted to reflect intensified exploitation of a more diversified, albeit geographically limited, resource base. The increased morphological diversity of similar artifact types during the Archaic Period (Walthall 1980) is probably reflective of geographic preference and constraints. At the same time, such limitations may have also provided the impetus for the formation of trade networks, some of which become complex and far-reaching during the later Woodland and Mississippian Periods.

Population increases in Mississippi are, in general, evidenced by the increased number of prehistoric sites, along with the intensity of their occupation. This increase in population is thought to have occurred in conjunction with progressive technological sophistication and a growing efficiency in the exploitation of the emergent Holocene environment (Caldwell 1958).

The Archaic Period has been divided into three subperiods: Early (8,000-6,000 B.C.), Middle (6,000-3,000 B.C.), and Late (3,000-1,000 B.C.). In Mississippi, Early Archaic components have been found at the Hester, Beaumont, and Colbert sites. While the Late Paleoindian occupation of the Hester site was apparently a hunting camp of modest proportions, the Early Archaic occupations there are interpreted as base camps, occupied by much larger populations over a greater part of the year. Several Early Archaic components were identified within the lower layers of midden mounds as a result of the Tennessee-Tombigbee Waterway project (McGahey 2000).

The Middle Archaic Period is characterized by additional changes in tool assemblages and projectile point forms. Ground and polished stone tools such as nutting and milling stones are commonplace, and grooved

stone axes and bannerstones appear in the tool assemblage (Sassaman 1983). Ground, highly polished, and drilled stone effigy beads appear for the first time and are more abundant in Mississippi than in any other state.

It is at the end of the Late Archaic Period that cultural/temporal periods become less easily defined based on projectile point morphology. This is mainly due to the introduction of ceramic technology in the subsequent periods and regional variation in the use of certain point types. Since ceramics are more subject to change, they are used as a more accurate indication of cultural/temporal phases. There are, therefore, several point types which appear in what would be considered the Late Archaic Period but are considered diagnostic of the later Poverty Point and Gulf Formational cultural periods.

The Poverty Point culture is a regional development focused on the Yazoo Basin in Mississippi. Point styles associated with the Poverty Point culture include corner-notched, side-notched, straight stemmed, and barbed forms, which date between 1,500 and 500 B.C. A large percentage of these points recorded in Mississippi are manufactured from non-local materials (McGahey 2000).

Gulf Formational Stage

The Gulf Formational stage refers to the period of initial development and spread of a ceramic technology initially developed on the Gulf Coastal Plain. In this region, the term Gulf Formational applies to a cultural/temporal period that begins at the end of the Late Archaic Period and is fully in place by the Middle Woodland Period (Jenkins and Krause 1986). In the region, this period falls between 1,000 and 100 B.C. and is represented by what is known elsewhere as the Middle and Late Gulf Formational stages. The Middle Gulf Formational stage (1,000-500 B.C) in the region is marked by the appearance of fiber-tempered ceramics associated with a culture known as Wheeler. The late Gulf Formational stage (500-100 B.C.) is distinguished by the presence of sand-tempered pottery, referred to as Alexander ceramics. Alexander ceramics are thought to have evolved from Wheeler ceramics. The use of sand as a tempering agent is seen as a technological advance in ceramic production and is thought to represent increased efficiency in food processing and storage (Jenkins and Krause 1986).

Woodland Period

The Woodland Period (1,000 B.C.-A.D. 1000) is characterized by the widespread use of ceramics, the appearance of burial mounds and other earthworks associated with ceremonial mortuary practices, and toward the later part of the period, the introduction of bow and arrow technology. Increased sedentism and an increasing reliance on local plants led to incipient agriculture and apparently resulted in widespread experimentation and innovation in the manufacture of ceramics.

Deer appears to be the main source of meat throughout the Woodland Period. However, during the later Middle Woodland Period the reliance on deer decreases while reliance on other mammals, fish, turtles, and shellfish increases, reaching a peak by the end of the Late Woodland Period. The first substantiated evidence for the presence of maize in the region does not occur until the Late Woodland Period.

Two notable, nonexclusive cultural trends distinguish the Woodland Period from the Archaic Period. One is the shift from an egalitarian social foundation to a hierarchical structure. A more sharply stratified social structure would affect the manner in which resources, labor, responsibility, and prestige were distributed throughout the group. The second trend is an increasing focus on ceremonialism. Evidence for the trend is indicated by the mortuary practices of Middle Woodland societies including the construction of earthen burial

mounds. Another escalating practice, one that is reflective of the emerging social hierarchy, is differential interment. Two factors bear mention: (1) spatial arrangement of burials based on an individual's age and gender, and (2) the presence of "exotic" artifacts, manufactured from non-local resource materials, that are interred with "prestigious" individuals.

In the southeastern United States, the Woodland Period (1,000 B.C.-A.D 1000), as with the other periods, is traditionally subdivided into the Early (1,000-100 B.C.), Middle (100 B.C.-A.D. 500), and Late (A.D. 500-1000) Woodland Periods. In the upper Tombigbee region of Mississippi, the Early Woodland corresponds to the Middle and Late Gulf Formational stages (Jenkins and Krause 1986).

It has been proposed that "nucleated settlements" may best describe site type(s) and distribution during the Middle Woodland Period. Based on investigations in the upper Elk and Duck river valleys in Tennessee, McCollough and Faulkner (1973) have suggested two possible patterns of Middle Woodland settlement: (1) large permanently occupied villages from which smaller groups disperse to exploit outside resources, and/or (2) large seasonally occupied villages. It is generally agreed that the primary agent for an increasingly sedentary settlement pattern is the greater focus on agricultural endeavors.

There is a marked distinction in Late Woodland cultural remains over the previous periods. Larger stemmed projectile point types are replaced by small triangular Madison and Hamilton type points, indicating the widespread use of bow and arrow technology. Micro-tools (small chert flakes used as knives) are also added to the lithic assemblage during this time. Grog is the dominant tempering agent and there is a noticeable lack of sand-tempered types. At the end of the period (A.D. 1000) shell-tempered pottery enters the assemblage as an extreme minority. An increase in the population is represented by the presence of numerous larger communities. Houses are small, rectangular, semi-subterranean structures. The construction of burial mounds ceases (Walthall 1980) and burials are arranged in a semi-extended position with individuals lying on their backs or sides with their heads oriented to the east. By the end of the Late Woodland Period, population levels were greatly increased and horticulture and non-burial mound ceremonialism became highly developed.

Mississippian Period

The Mississippian Period is generally dated between ca. A.D. 900 and 1600, although considerable regional variation is documented for the emergence and culmination of this period (Griffin 1967; Peebles 1970). The primary artifacts that are diagnostic of the Mississippian Period are a wide variety of utilitarian and non-utilitarian shell tempered ceramics. In hamlets and farmsteads, the ceramics were mainly undecorated utilitarian wares including storage vessels such as jars and bottles, cooking pans, and consumptive vessels such as cups and bowls. Although a wide range of non-decorated utilitarian wares were also present in ceremonial centers and villages, vessels were often decorated with symbolic motifs and effigy vessels were common. Other ceramic artifacts included effigy (smoking) pipes, disks, human effigies (fertility figurines), and animal effigies.

Small triangular projectile points such as Madison and Hamilton are diagnostic of the Mississippian Period. An array of woodworking tools including adzes, axes, chisels, and wedges/splitters are also found on Mississippian sites. Other lithic artifacts occurring during this period include discoidals/gaming stones and carved human and nonhuman effigies.

Subsistence activities were dominated by intensive agricultural pursuits including the cultivation of maize (*Zea mays*), beans (*Phaseolus vulgaris*), and squash (*Cucurbits sp.*). Other cultural characteristics of the

period include complex social/political organization; complex economic systems; large ceremonial centers; wall-trench houses; and pyramidal, flat-topped mounds (Griffin 1967).

Brown (1979) noted intensive use of the Loess Hills around Vicksburg during the Mississippian period. The Coles Creek culture (A.D. 700 to 1200) marks the beginning of the Mississippian period in the Lower Mississippi Valley and Loess Hills. This culture is contemporaneous with Terminal Woodland and Emergent/ Early Mississippian periods elsewhere in the South (Fritz and Kidder 1993). Coles Creek period sites do not have shell-tempered pottery, but they do have earthen mounds. The Coles Creek period is most known for the distinct spatial patterns present on the sites. These typically consist of a series of small platform mounds positioned around a central plaza (Neuman 1984). This period also saw numerous examples of complicated stamping of ceramics in Louisiana. In addition, the bow and arrow was introduced during this period, which might have led to the collapse of the Coles Creek culture. The increase in available food led to an increase in population that the communities could no longer support. Another thing that could have led to the cultural collapse was changes in weather patterns, as weather from around A.D. 500 to 800 was cooler and drier. This changed the availability of food at a time when native societies were already stressed to provide for the growing populations. These stresses led to an increase in warfare that continued into the following period (Stoltman 1978).

The Plaquemine culture evolved from the Coles Creek culture. Typical ceramic types include Anna, Foster, Emerald, and Natchez and unlike "classic" Mississippian assemblages, which include heavy use of shell tempering, the Plaquemine ceramics are tempered with a combination of inorganic and organic materials, which may include bone and crushed shell (Morgan n.d.; Neitzel 1965, 1983). The Plaquemine culture takes its name from the Medora Site (16WBR1), which is found in the town of Plaquemine, Louisiana. During this time an almost simultaneous florescence occurred over many parts of the Southeast, resulting in the development of large, hierarchical societies centered at impressive mound complexes such as Cahokia in present day Illinois, Spiro in Oklahoma, Moundville in Alabama, and Etowah in northwest Georgia. Differentiating the Plaquemine culture further from their earlier Coles Creek ancestors is the brushing and engraving techniques observed in their pottery (Smith et al. 1983). This culture came to an end with the appearance of European explorers.

Protohistoric Period

In 1539, the Spanish conquistador Hernando de Soto's expedition landed near present-day Tampa Bay, Florida and spent the next few years exploring the southeast and bringing death and destruction to the hapless Native Americans they encountered. If not brought down by violence, the natives were stricken by diseases to which they had no resistance. It is not certain it this contact resulted in the end of most Mississippian sociopolitical organizations, or if other factors had already started the demise. But by 1600, archaeological evidence indicates that most of the large Mississippian civic-ceremonial centers were either abandoned or had suffered substantial declines in population. The populations of these centers apparently dispersed into smaller villages, hamlets, and farmsteads. The scattered tribal units encountered by seventeenth century explorers probably bore little resemblance to the highly integrated cultural systems of the Mississippian peoples. The Natchez were the only group still exhibiting a Mississippian pattern at the time the French entered the region in the seventeenth century.

More than a century after de Soto's expedition, the French explored and claimed the Mississippi River area. In 1673, Father Jacques Marquette and Luis Jolliet traveled down the Mississippi River from Canada and observed Indians with firearms and other European trade items in the area of northern Mississippi. Rene-Robert Cavalier, Sieur de La Salle traveled down the Mississippi River in 1682, claiming all the land it

drained for France. La Salle was followed by Henri de Tonti in 1685. In 1699, Pierre Le Moyne, Sieur D'Iberville, and his brother, Jean Baptiste, Sieur De Bienville, founded Fort Maurepas near the present site of Ocean Springs.

Post-contact Period to Statehood

The French brought not only explorers but fur traders and missionaries, and for a time the French and the Indians led a cautious co-existence. The Europeans built fortifications, such as Fort Rosalie, established in 1716 at present-day Natchez, Mississippi. Cultural differences and misunderstandings eventually led to squabbles and all-out war between the Natchez Indians and the French colonists. The English, vying with France and Spain for control of the New World, encouraged the Indians' animosity toward the French. The Natchez Indians rose up against the French settlers in 1729 in an attempt to drive them off their lands. The French retaliation practically decimated the tribe. Many Natchez refugees joined other tribes, including the Chickasaws, Creeks, and Cherokees (Barnett 2007). The French and Indian War (1754-1763) involved many more factions than just the French and the Indians. Hostilities between France and Great Britain had been building for years, as both fought to seize more land and control in the New World. Great Britain had the backing of Anglo-American colonists and the powerful Iroquois confederacy. France had her own native allies and French colonists. Peace was accomplished with the Treaty of Paris in 1763, which gave the French territory east of the Mississippi to the British, along with Spanish Florida (United States Department of State 2014).

The British divided Spanish Florida into East and West Florida. What is now Southern Mississippi became a part of West Florida, with Pensacola as the seat of government (Haynes 2000). Settlement was slow at first and British rule was plagued with ineffectual governors. In 1770, with the appointment of Peter Chester as the governor, the settlement shifted to lands along the Mississippi River. Not only were the soils more fertile than the sandy soils of the coast, but the Chickasaw and Choctaw Indians were more peaceful than the eastern Creeks. The river also furnished a highway for the fur and slave trade. Although neither East nor West Florida joined the American Revolution, the colonies there were not untouched by the conflict. Many British loyalists sought refuge in West Florida. In the aftermath, Bernardo de Galvez, Spanish governor of Louisiana, took Natchez in 1779 and Pensacola in 1781. Through a series of treaties that marked the end of the American Revolution, the United States received independence and the territory east of the Mississippi River between the Great Lakes and the thirty-first parallel. Spain disagreed and it took the Pinckney Treaty of 1795 to settle the dispute in favor of the U.S. (Haynes 2000).

Following the treaty, Spain was slow to evacuate the land given to the U.S. They finally did so in 1798 and the Territory of Mississippi was established on April 7, 1798 (Bunn and Williams 2008). The original boundaries were the Mississippi River to the west, the Chattahoochee River to the east, the thirty-first parallel to the south, and the confluence of the Yazoo and the Mississippi rivers to the north. The boundaries were extended twice and by 1813 included the present boundaries of Mississippi and Alabama. In 1817, the area was divided between the two interests and Mississippi was granted statehood, with Natchez as the state capital (Bunn and Williams 2008).

Choctaw Cessions

During the Territorial Period, Mississippi grappled with the problem of how to get the Native Americans off their ancestral land to clear the way for Euro American settlement. In 1801, the Treaty of Fort Adams took over 2.5 million acres of land from the Indians (Figure 9). This was located from the Yazoo River south to the thirty-first parallel. This treaty also gave the U.S. the right to build a road from Natchez to Nashville through

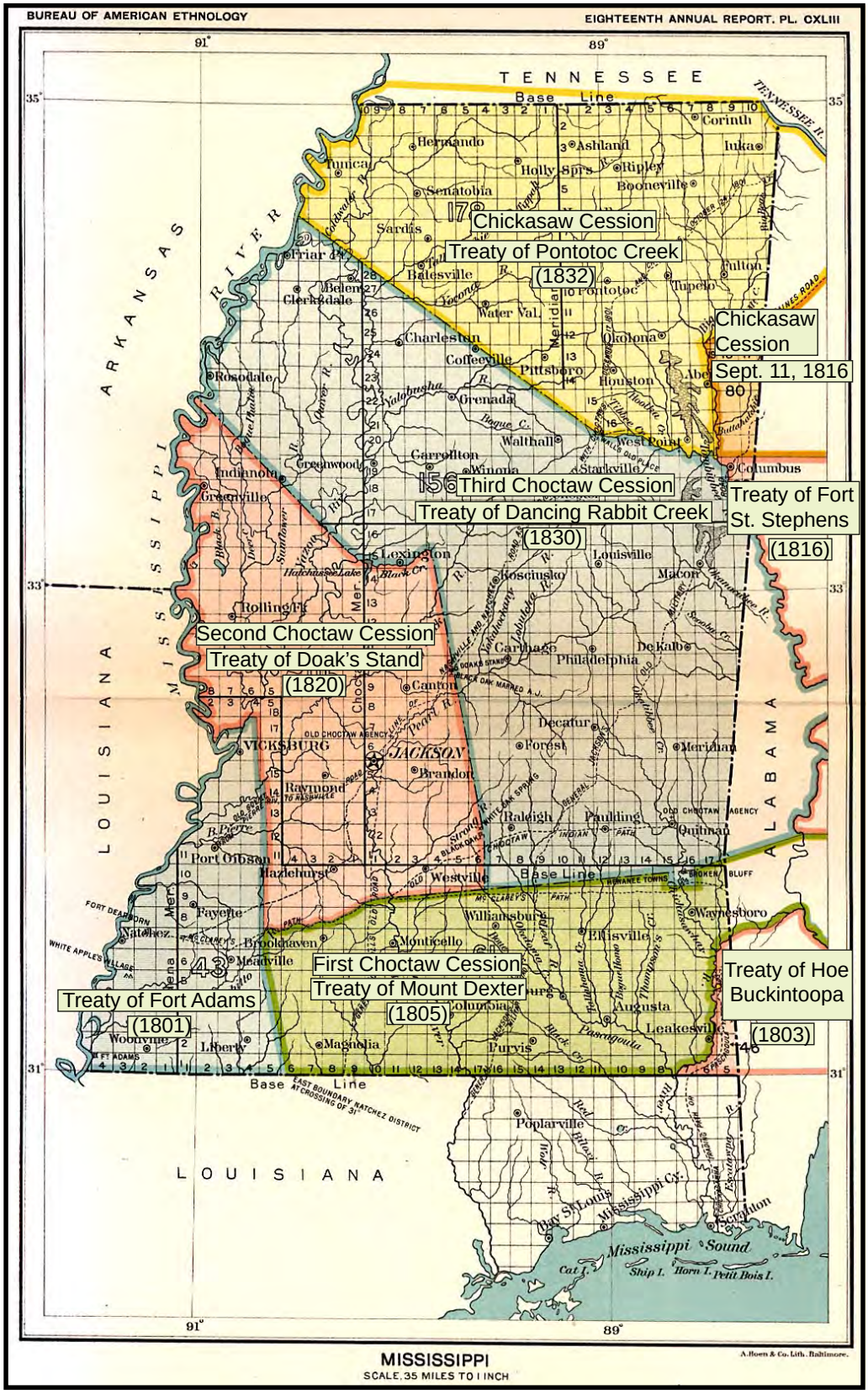

Figure 9. *Map depicting major Choctaw and Chickasaw land cessions (from Bureau of American Ethnology - Eighteenth Annual Report of Bureau of American Ethnology, 1896-1897, plate CXLIII).*

Choctaw land (what later became known as the Natchez Trace). Indians displaced by the treaty received a small amount of money and merchandise and three sets of blacksmith's tools (McKee and Schlenker 1980). The 1802 Fort Confederation Treaty involved a small tract of land north of Natchez, but as there was no compensation for the Indians with this treaty, the chiefs signed reluctantly. The Treaty of Hoe Buckintoopa in 1803 nibbled away more land, this time approximately 850,000 acres located north of Mobile, Alabama. At first the chiefs refused to listen until reminded of their debts to the British supplier, Panton, Leslie, and Company. Their debts were wiped out and each chief signing received 15 pieces of strouds (coarse, woolen fabric), three rifles, 150 blankets, 250 rounds of powder, 250 pounds of lead, one bridle, one man's saddle, and one black silk handkerchief (McKee and Schlenker 1980).

The Treaty of Mount Dexter in 1805 wrested even more land from the native inhabitants and became known as the First Choctaw Cession (see Figure 9). More than four million acres of fertile land from the Natchez District to the Alabama-Tombigbee watershed was traded for $50,500 in cash, most of which went to pay off debts to the Panton, Leslie, and Company, with the remainder going to a white interpreter (McKee and Schlenker 1980). This treaty also provided promised amounts of annual money to the chiefs to dispense however they saw fit.

The Choctaw supported the U.S. during the War of 1812, rejecting Shawnee chief Tecumseh's urging them to join his Indian confederacy. Pushmataha, a leading Choctaw chief, led warriors to fight with Andrew Jackson at the Battle of Holy Ground, the Battle of Horseshoe Bend, and the Battle of New Orleans. For a few years, relations between the Choctaw and the U.S. government were good, until the Creek War created more boundary issues. The Treaty of Fort St. Stephens in 1816 ceded a relatively small amount of land east of the Tombigbee River in exchange for an annual payment that would be held by the U.S. government and invested, with the interest going toward Indian education (McKee and Schlenker 1980). The following year, Mississippi was granted statehood, precipitating more settlers moving into the areas held by the Choctaw.

In 1820, at a tavern in the southeast corner of what is now Madison County, the Treaty of Doak's Stand (the Second Choctaw Cession) pushed the Choctaw closer to losing their entire lands east of the Mississippi River (see Figure 9). The Choctaw gave up over five million acres north and east of the Natchez District in exchange for 13 million acres in Arkansas. Relocation to this new territory was a given and Andrew Jackson pledged support for schools, stores, blacksmith's shops, and agents. In addition, each relocated man would receive a blanket, a kettle, a rifle, bullet molds and ammunition for one year plus one year's worth of corn (McKee and Schlenker 1980). Problems arose when the Choctaw did not want to relocate nor did the white settlers in Arkansas want to be displaced from their homes. Treaty renegotiations were held in Washington, D.C. with the three Choctaw district chiefs making the journey. Fortune did not smile on the delegation as Chief Puckshenubbee fell off a cliff in Kentucky and died the day before they arrived in the city and Pushmataha died of a throat infection while there (Mississippi Band of Choctaw Indians [MBCI] 2014). In spite of this, the Treaty of 1825 was seen as a success and more money was given to the Choctaw, with Arkansas land being replaced with Oklahoma land. The lenient nature of Secretary of War, John Calhoun, and Bureau of Indian Affairs chief, Thomas L. McKenney, provided no impetus for the Choctaw to relocate, so few did. This all changed in 1829 when Andrew Jackson took office as president. The state of Mississippi tried a harsher rule and declared the rule of the Indian chiefs as invalid and made the Choctaw citizens of Mississippi (McKee and Schlenker 1980).

With the deaths of two of the three district chiefs, two men of mixed-blood now held positions of authority and both were for relocation. To prevent a civil war, one man, a mixed-blood named Greenwood Le Flore, was made chief of all the Choctaw. Le Flore proposed a removal treaty that was rejected by Jackson as he disliked the terms. But, realizing conditions were ripe for a removal treaty, a meeting place and time was

decided. As the Choctaw refused to meet outside their lands, the talks were held between the two forks of Dancing Rabbit Creek in what is now Noxubee County. The Treaty of Dancing Rabbit Creek (1830), also known as the Third Choctaw Cession, sealed the fate of the Choctaw Indians – to be forcibly removed to Indian Territory, now known as Oklahoma, giving up claim on some 11 million acres in the state of Mississippi (see Figure 9). The deal was for one-third of the Choctaw Nation to relocate each year for three years. The U.S. government would pay for the relocation and for one years's worth of provisions upon arrival. They also promised money for education, a church, and a council house. Donations of blankets, looms, axes, rifles, farming tools, and other items would be made. Surprisingly, a provision was made for those Choctaw who wished to stay in Mississippi. Chiefs would receive money and four sections of land (2,560 acres), while lesser officials would receive less land and no money. Each adult man or woman who registered with the Indian agent would receive 640 acres of land, each child over 10 would receive 320 acres, and each child under 10 would receive 160 acres (McKee and Schlenker 1980). With this treaty, the U.S. government now owned all the Choctaw lands in Mississippi.

Some 5,000 Choctaw remained in Mississippi at the end of removal (McKee and Schlenker 1980). Only about 1,300 of these were actually granted the land they were promised and by 1850, almost none of them retained it (Carleton 2002). Unscrupulous white men defrauded the Indians or outright took the granted lands. The 1918 influenza outbreak claimed 25 percent of the Mississippi Choctaw, most of who were living in poverty. In the 1920s, the Bureau of Indian Affairs built elementary schools and a hospital in a late effort to assist (Carleton 2002). The Mississippi Band of Choctaw Indians was federally recognized in 1945, and is the only group in Mississippi to be so recognized. Today, there are approximately 10,000 members on 35,000 acres in 10 counties (MBCI 2014). Sadly, of the 500 square miles granted the Choctaw who registered and remained in Mississippi following removal, none remain in Choctaw hands (MBCI 2014).

Statehood to Present

The first settlers in the area that later became Grenada County were missionaries who created an Indian mission school in 1815, in what is now the town of Elliott. Following the 1830 Treaty of Dancing Rabbit Creek, the town of Chocchama was established at the location of the land office (MSGenWeb 2022). Early land holders established two towns on either side of a section line, known as Pittsburg and Tullahoma. Distracting rivalry between the towns gave way to a call for unity. On July 4, 1836, the two were joined in a mock wedding ceremony to form the town of Grenada, which is thought to be a misspelling of Granada, Spain (Grenada Mississippi Tourism Commission 2020).

The Yalobusha River running through the area was an important transportation corridor. Steamboats ran from Grenada to Vicksburg, sending cotton and receiving supplies and merchandise. The coming of the railroad in 1860 caused a rapid decline of river traffic. Two rail lines crossed here, the Mississippi Central and the Mississippi & Tennessee. Cotton warehouses were dismantled and moved from the river's edge to alongside the railroad. Hotels and businesses followed. Just as the economy was picking up, the Civil War began. In August of 1863, Union forces destroyed Grenada's rail depot, yard buildings, 80 locomotives, and 200 freight cars, along with two steam cotton mills near the tracks. The rebuilding effort was slow (Grenada Mississippi Tourism Commission 2020).

Grenada County was created on May 9, 1870 from portions of Yalobusha, Tallahatchie, and Carroll counties. The town of Grenada weathered a yellow fever epidemic in 1878, which killed off almost 20 percent of the population, and two devastating fires in 1884 and 1891 that destroyed much of downtown (Grenada Mississippi Tourism Commission 2020).

In 1880, almost three-quarters of the inhabitants were African American, working primarily in agriculture, raising grains, cotton, and livestock. By 1930, the industrial sector had grown to support about 600 workers versus only 133 in 1900. Most farmers were tenants and the African American population remained dominant numerically. By 1960, the population was more evenly divided racially. Agriculture diminished with the largest employers in textiles, retail, and domestic work (Mississippi Encyclopedia Staff 2018).

James Meredith's March against Fear arrived in Grenada on June 15, 1966. Participants included Dr. Martin Luther King, Jr., Joan Baez, Andrew Young, Ralph Abernathy, and other prominent civil rights activists (Grenada Mississippi Tourism Commission 2020). This sparked a five-month long stretch of marches, demonstrations, boycotts, and protests challenging the white supremacy groups in the county. The 1966 school integration in Grenada initiated some of the most violent riots and attacks. If the children could get past the angry white mobs to get to school, they were attacked upon leaving. After several weeks, the courts forced the police to protect the children and prohibit the mob from gathering at the school. Full integration was achieved in 1969 (The University of Southern Mississippi Libraries Special Collections 1999).

LITERATURE AND DOCUMENT SEARCH

Before conducting the fieldwork, APA performed a literature and document search in order to gather pertinent background information regarding the subject property and its surroundings. This search included an online query of the MDAH (2023) Mississippi State Archaeological Site File (MSASF). A one-mile (1.6 kilometers [km]) radius search was conducted around the proposed project area for previously recorded archaeological sites and previous cultural resource surveys. The search area was also inspected for historic structures recorded within MDAH's historic property files and in the National Register of Historic Places (NRHP) (National Park Service 2023). Background research revealed one previously recorded site, one previously recorded historic resource, and four previously conducted cultural resource surveys within a mile of the study area (Figure 10). There is no information on the MDAH website for Survey 00-002.

Site 22Ca0201 is a segment of MS State Route 8 from just west of Butputter Creek in Grenada County to east of Sabougla Creek in Calhoun County. This early twentieth century route was recommended as ineligible.

Historic resource 043-GRN-5026-X is the Gillion School (Black). There is no information on when it was built or when it became non-extant.

Survey 02-022. *Cultural Resources Reconnaissance of Approximately 1600 Acres, Grenada Lake Corps of Engineers, Grenada County, Mississippi*. This 1600-acre survey was performed by Archaeology Mississippi, Inc. Four cemeteries and six late nineteenth-early twentieth century farmsteads were recorded. Two Civil War earthwork sites were revisited. The farmsteads were recommended as ineligible for the NRHP and the other resources are being avoided and protected (Lauro 2002).

Survey 18-0065. *Cultural Resource Survey for Five Bridge Replacements on State Route 8, Grenada and Calhoun Counties, Mississippi.* This 142-acre survey was performed by Panamerican Consultants, Inc. In addition to recording the above-mentioned 22Ca0201 road segment, historic site 22Ca620 was also identified. Both were recommended as ineligible for the NRHP (Saatkamp et al. 2018).

Survey 22-0234. *Phase I Cultural Resources Survey for the Butputter Borrow Pit, Grenada County, Mississippi.* APA performed this 6.6-acre survey and recorded two c.1955 barns and a c.1932-1959 road sign. The sign was originally for a Texaco service station, but was moved and repainted to say "Clanton Farm," but has now faded. All three resources were recommended as ineligible for the NRHP (Glass 2022).

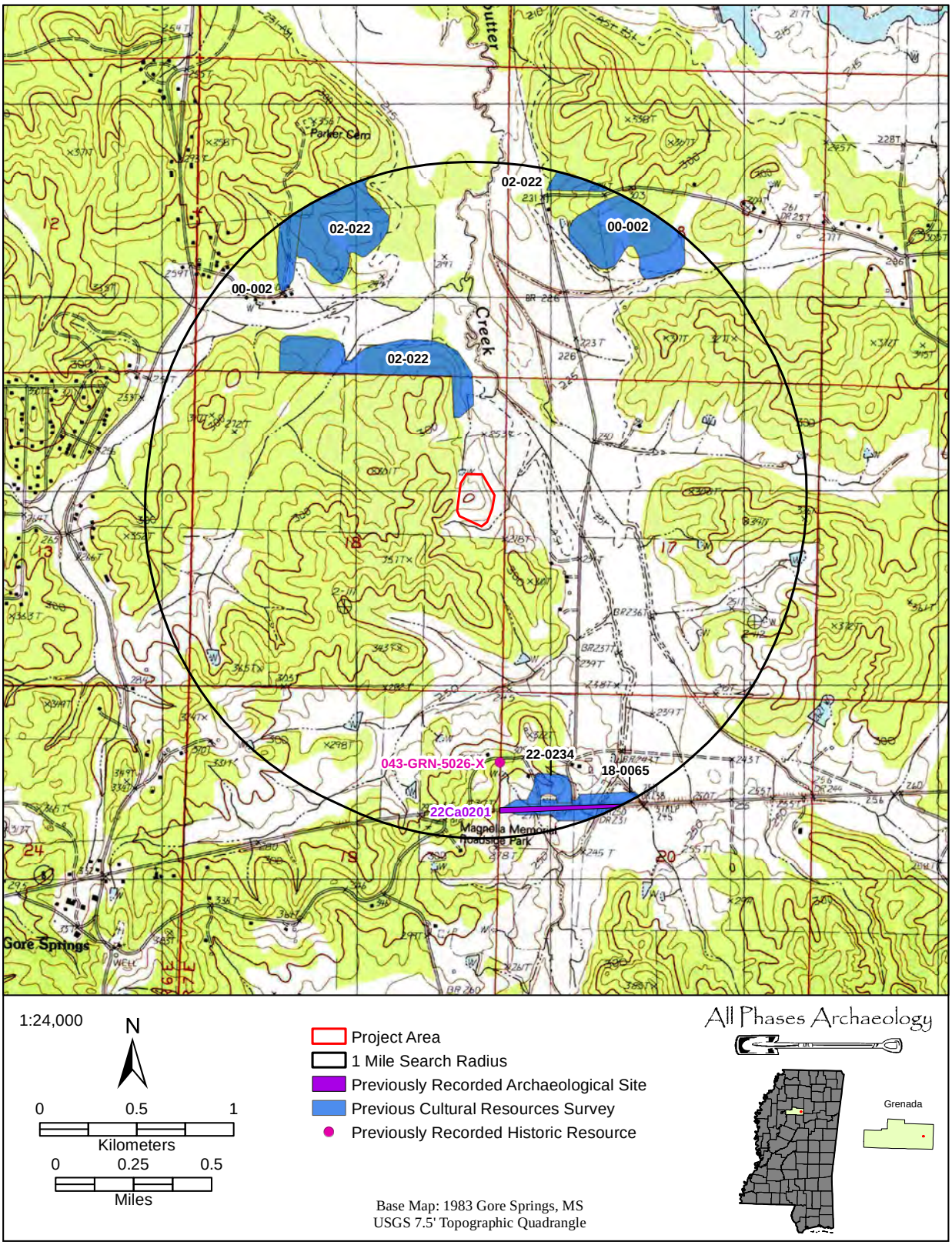

Figure 10. *Map showing a previous survey, a previously recorded historic structure, and a previously recorded site within one mile of the project area.*

Historic maps were also reviewed in order to ascertain if structures were once present within the project area. Maps reviewed include the 1915 Grenada County soil survey and the 1955 Coffeville, MS USGS 15' topographic quadrangle. No structures were shown within the study area.

Bureau of Land Management, General Land Office records indicate that Laurent Millaudon received the northeast quarter of Section 18 on January 2, 1839. It is unknown if he ever lived there.

FIELD METHODS

A Phase I cultural resources survey was guided by procedural standards established by MDAH. Land coverage requirements were achieved by walking and visually inspecting the entire survey area. Any exposed surfaces were carefully examined for cultural material. Subsurface testing was performed along 30-m interval transects comprised of shovel tests spaced 30 m apart. If cultural material is discovered, delineations are then performed at 10-m intervals. Standard shovel tests consist of 30 centimeter (cm) diameter cylindrical holes excavated to 10 cm into the sterile subsoil layer. Soils from each test are screened through 1/4-inch hardware cloth for the purpose of recovering any cultural material that may exist at that location. When cultural material is encountered, the material is sorted by provenience and placed into bags labeled with the pertinent excavation information before being transported to APA's laboratory.

LABORATORY METHODS AND COLLECTION CURATION

All cultural materials recovered during field projects are delivered to APA's laboratory in Mobile, Alabama for processing. Here, materials are sorted by provenience, cleaned, and analyzed. Along with the cultural material, all project records, photographs, and maps produced while conducting the investigation are transported for curation at the Capers Archaeological Repository with the Mississippi Department of Archives and History in Jackson, Mississippi.

RESULTS OF FIELD INVESTIGATIONS

The project area slopes down in all directions from a centrally located hill. The slope is increased to the north, east, and south. There are no trees and the vegetation consists of tall, weedy grasses. A deer stand is located at the top of the hill near the center of the project area. Nearby is an area of soil disturbance, possibly from heavy machinery. A dirt road provides access to the project.

The current investigation required 42 shovel tests to be attempted in the survey area. Of these, 23 were negative and 19 could not be excavated due to slope (Figure 11). A typical shovel test contained 20 cm of pale brown (10YR 6/3) silt over reddish yellow (7.5YR 7/6) clay silt to 45 cmbs over strong brown (7.5YR 5/8) clay to 55 cmbs (Figure 12). Soils were dry and compact. No cultural material was found subsurface, nor were any artifacts observed on the surface.

CONCLUSIONS AND RECOMMENDATIONS

APA, under contract with TL Wallace Construction, Inc., performed the Phase I cultural resources survey for the Butputter 2 Dirt Pit project in Grenada County, Mississippi on August 21, 2023. No archaeological sites or historic resources were found. Based on the findings of this investigation, no further cultural resources studies are recommended. No historic properties are present in the project area.

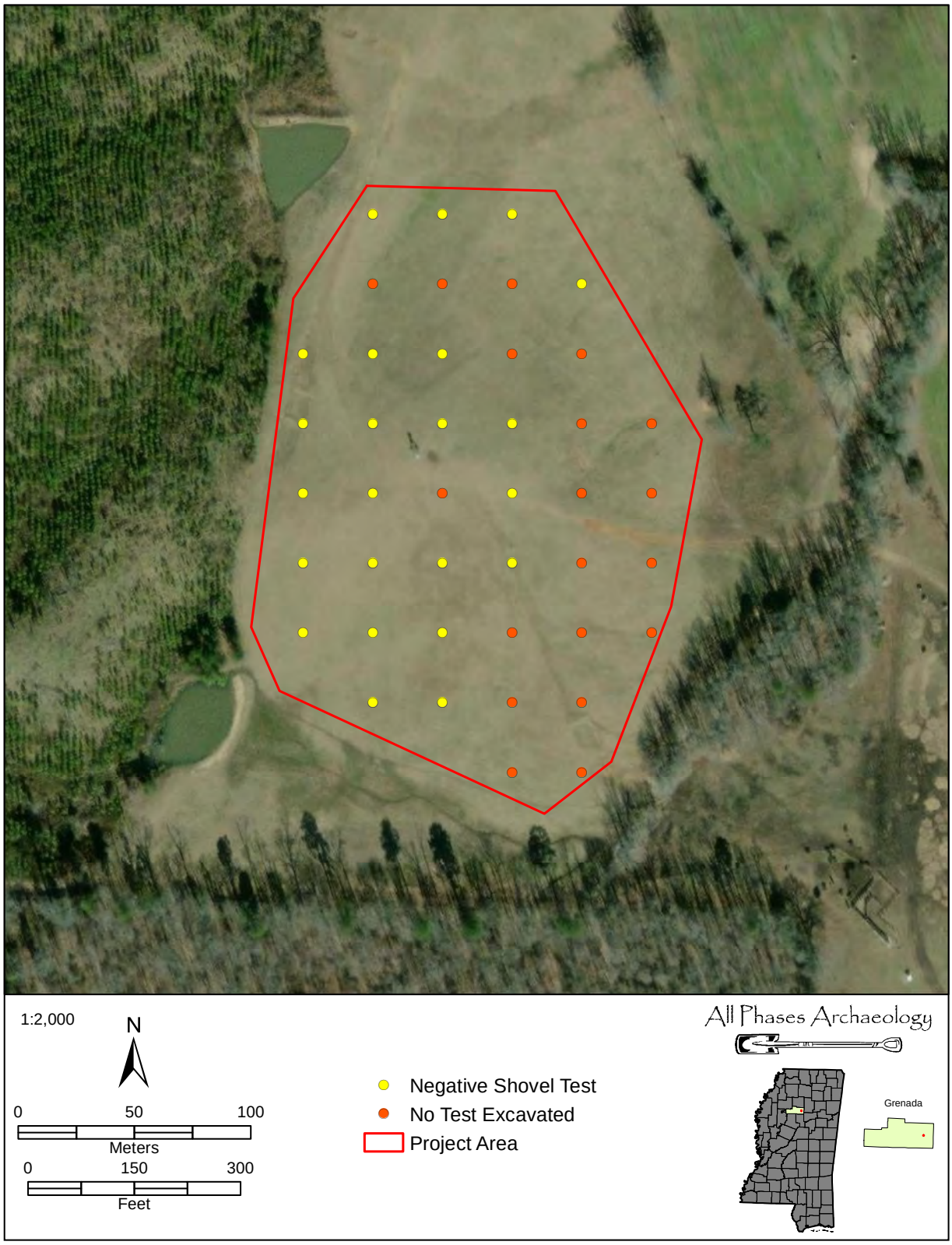

Figure 11. *Aerial image showing shovel tests within the survey area.*

Figure 12. *Typical shovel test profile in the project area.*

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APPENDIX A
MDAH REQUEST LETTER

MDAH
MISSISSIPPI DEPARTMENT OF
ARCHIVES & HISTORY

P.O. Box 571
Jackson, MS 39205-0571
601-576-6850
mdah.ms.gov

August 16, 2023

Ms. Tracy Bedwell
T. L. Wallace Construction
4025 MS-35
Columbia, Mississippi 39429

RE: Proposed Dirt Pit, SR 8 over Butputter Creek, by TL Wallace Construction, (MDEQ) MDAH Project Log #08-117-23, Grenada County

Dear Ms. Bedwell:

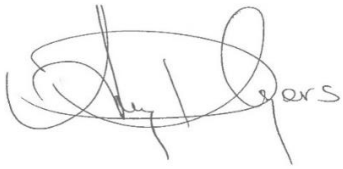
We have reviewed your request for a cultural resources assessment, received on August 16, 2023, for the above referenced project in accordance with our responsibilities under Section 106 of the National Historic Preservation Act and 36 CFR Part 800.

After review, due to the topography of the area, the project being in close proximity to Grenada Lake and the area of potential effect not previously being examined for cultural resources, it is our determination that a cultural resources survey must be performed by a professional archaeologist. The resulting report should reference the project log number above on the title page.

A list of individuals who have represented themselves as being willing and qualified to do archaeological survey work in Mississippi will be furnished upon request. A copy of this letter should be made available to the contracting archaeologist(s).

If you have any questions, please do not hesitate to call us at (601) 576-6940.

Sincerely,



Amy D. Myers
Preservation Planning Administrator

FOR: Katie Blount
State Historic Preservation Officer

Appendix I

Fecal Coliform TMDL for 303d Stream

FINAL
May 2010

Fecal Coliform TMDL for Butputter Creek

Yazoo River Basin

Grenada County, Mississippi

Prepared By

Mississippi Department of Environmental Quality
Office of Pollution Control
Standards, Modeling, and TMDL Branch

MDEQ
PO Box 2261
Jackson, MS 39225
(601) 961-5271
www.deq.state.ms.us

Mississippi Department
of Environmental Quality

FOREWORD

The report contains one or more Total Maximum Daily Loads (TMDLs) for water body segments found on Mississippi's current Section 303(d) List of Impaired Water Bodies. The implementation of the TMDLs contained herein will be prioritized within Mississippi's rotating basin approach.

As additional information becomes available, the TMDLs may be updated. Such additional information may include water quality and quantity data, changes in pollutant loadings, modifications to the water quality standards or criteria, or changes in landuse within the watershed. In some cases, additional water quality data may indicate that no impairment exists.

Prefixes for fractions and multiples of SI units

Fraction	Prefix	Symbol	Multiple	Prefix	Symbol
10^{-1}	deci	d	10	deka	da
10^{-2}	centi	c	10^{2}	hecto	h
10^{-3}	milli	m	10^{3}	kilo	k
10^{-6}	micro	μ	10^{6}	mega	M
10^{-9}	nano	n	10^{9}	giga	G
10^{-12}	pico	p	10^{12}	tera	T
10^{-15}	femto	f	10^{15}	peta	P
10^{-18}	atto	a	10^{18}	exa	E

Conversion Factors

To convert from	To	Multiply by	To Convert from	To	Multiply by
Acres	Sq. miles	0.00156	Days	Seconds	86400
Cubic feet	Cu. Meter	0.02832	Feet	Meters	0.3048
Cubic feet	Gallons	7.4805	Gallons	Cu feet	0.13368
Cubic feet	Liters	28.316	Hectares	Acres	2.4711
cfs	Gal/min	448.83	Miles	Meters	1609.34
cfs	MGD	0.64632	Mg/l	ppm	1
Cubic meters	Gallons	264.173	μg/l * cfs	Gm/day	2.45

CONTENTS

FIGURES

TABLES

TMDL INFORMATION PAGE

Listing Information

Name	ID	County	HUC	Cause
Butputter Creek	MS330BE	Grenada	08030205	Pathogens
Near Grenada from Headwaters to Grenada Lake Flood Pool				

Water Quality Standard

Parameter	Beneficial use	Water Quality Criteria
Fecal Coliform	Secondary Contact	**May - October**: Fecal coliform colony counts are not to exceed a geometric mean of 200 per 100ml based on a minimum of 5 samples taken over a 30-day period with a minimum of 12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 400 per 100ml more than 10% of the time. **November – April**: Fecal coliform colony counts shall not exceed a geometric mean of 2000 per 100 ml based on a minimum of 5 samples taken over a 30-day period with no less than 12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 4000 per 100 ml more than 10% of the time.

Total Maximum Daily Load for Segment 802611

WLA (counts per day)	LA (counts per day)	MOS (counts per day)	Total TMDL (counts per day)	TMDL Percent Reduction
0.00E+00	5.61E+10	6.23E+09	6.23E+10	73.5%

EXECUTIVE SUMMARY

A pathogen TMDL has been developed for the water body segment of Butputter Creek, MS330BE, which is on the Mississippi 2008 Section 303(d) List of Impaired Water Bodies. The recent monitoring data collected for this segment was assessed based on the 2007 *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters*. MDEQ selected fecal coliform as an indicator organism for pathogenic bacteria.

Butputter Creek flows in a northerly direction from its headwaters near Grenada to the Grenada Lake Floodpool. Due to data limitations, complex dynamic modeling was inappropriate for performing the TMDL allocations for this study, as were load duration curves. Therefore, a mass balance approach was used to develop the TMDL for segment MS330BE.

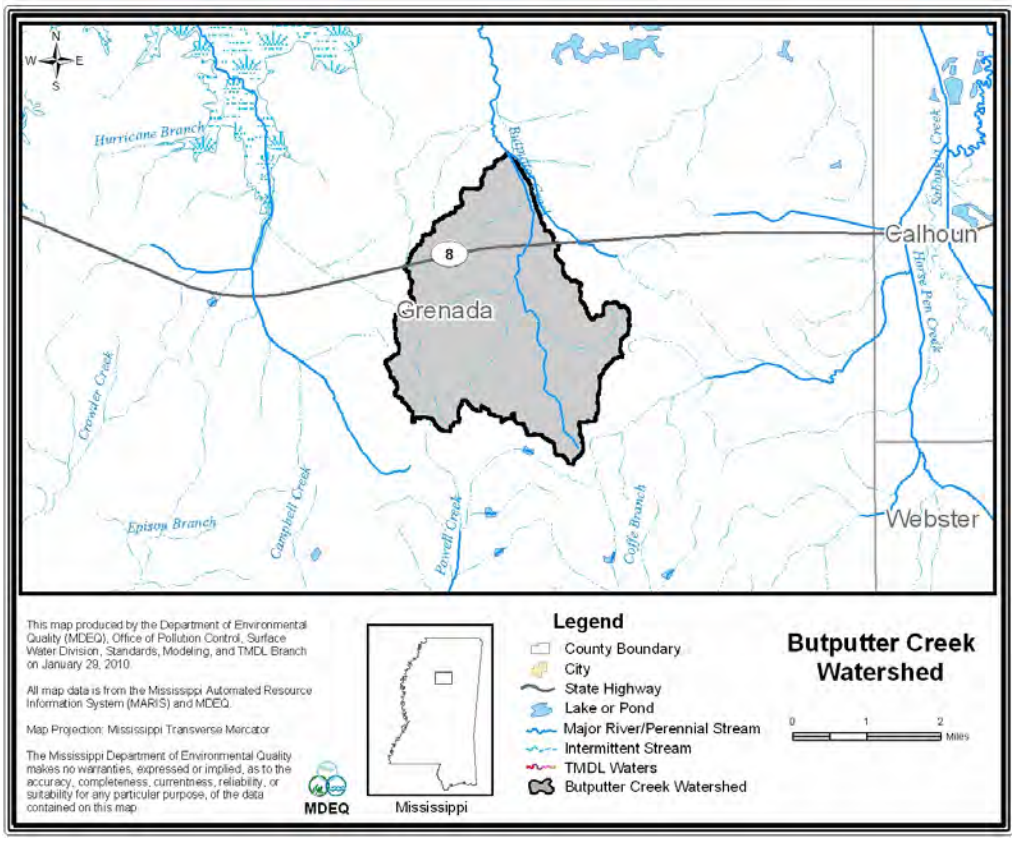


Figure 1. Location of the Butputter Creek Watershed

Although fecal coliform loadings from point and nonpoint sources in the watershed were not explicitly represented with a model, a source assessment was conducted for the Butputter Creek Watershed. Nonpoint sources of fecal coliform may include wildlife, livestock, and urban/ developed areas. Also considered were the nonpoint sources such as failing septic systems and other direct inputs into Butputter Creek. There are no NPDES permitted discharges included as point sources in the wasteload allocation (WLA).

The seasonal variations in hydrology, climatic conditions, and watershed activities are represented through the use of a seasonal TMDL based on average flows and seasonal monitoring. A critical period for the TMDL was determined to be in the summer since violations of the standard occurred only in the summer monitoring periods. An explicit 10% margin of safety (MOS) was used in the

mass balance method to account for uncertainty.

Water quality data indicated violations of the fecal coliform standard in the water body during the summer season. The estimated summer reduction of fecal coliform bacteria is 73.5% for segment MS330BE.

INTRODUCTION

1.1 Background

The identification of water bodies not meeting their designated use and the development of total maximum daily loads (TMDLs) for those water bodies is required by Section 303(d) of the Clean Water Act and the Environmental Protection Agency's (EPA) Water Quality Planning and Management Regulations (40 CFR part 130). The TMDL process is designed to restore and maintain the quality of those impaired water bodies through the establishment of pollutant specific allowable loads. The pollutant of concern for this TMDL is pathogens as indicated by fecal coliform. Fecal coliform bacteria are used as indicator organisms because they are readily identifiable and indicate the possible presence of other pathogenic organisms in the water body. The TMDL process can be used to establish water quality based controls to reduce pollution from nonpoint sources, maintain permit requirements for point sources, and restore and maintain the quality of water resources.

A TMDL has been developed for segment MS330BE of Butputter Creek, which is approximately 3.3 miles long from its headwaters near Grenada to the Grenada Lake flood pool as shown in Figure 2. Segment MS330BE is listed on the Mississippi 2008 Section 303(d) List of Impaired Water Bodies for pathogens. There are no NPDES permitted wastewater treatment facility in the Butputter Creek Watershed. The fecal coliform data that were recently collected for this segment are listed in Section 2.2.

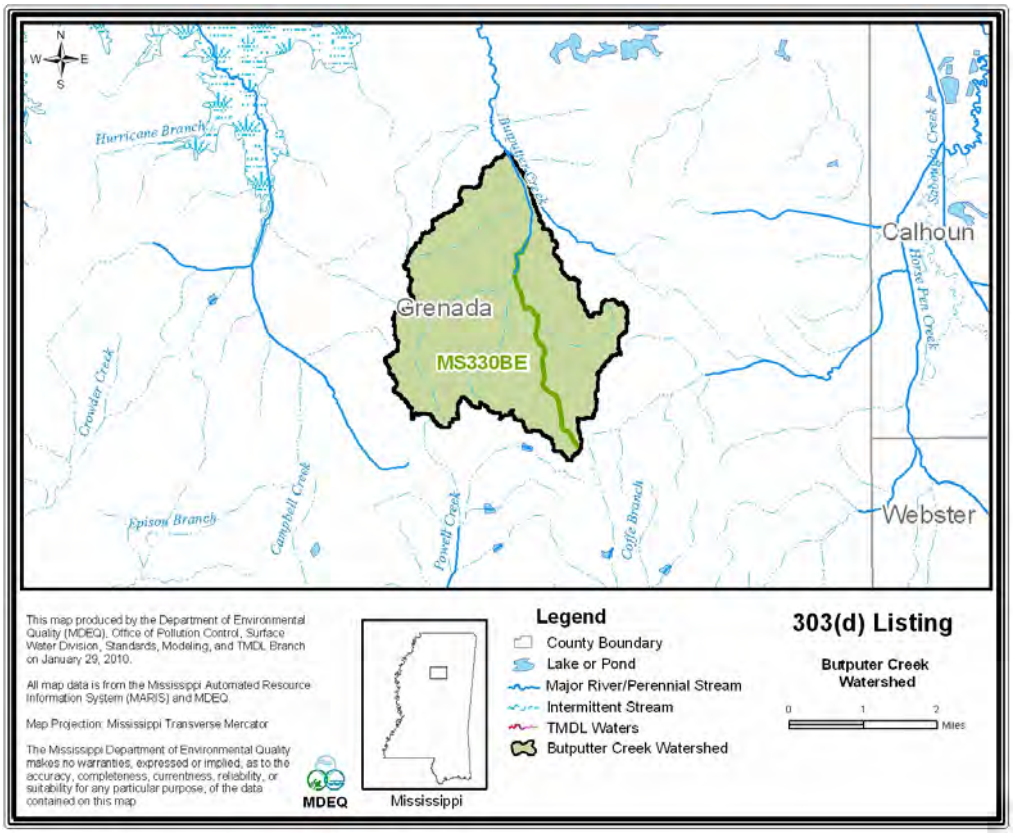


Figure 2. Butputter Creek Watershed Segment

The mass balance method is an applicable method for TMDL development when the water quality data are collected in a manner consistent with the water quality standards, (5 samples collected within a 30 day period). The mass balance method requires water quality data and flow data. The water body segment is shown in Figure 3. The TMDL for segment MS330BE was developed using the mass balance method with water quality data from Station FTN-36. The average flow of 10.7 cfs was found in the National Hydrology Dataset.

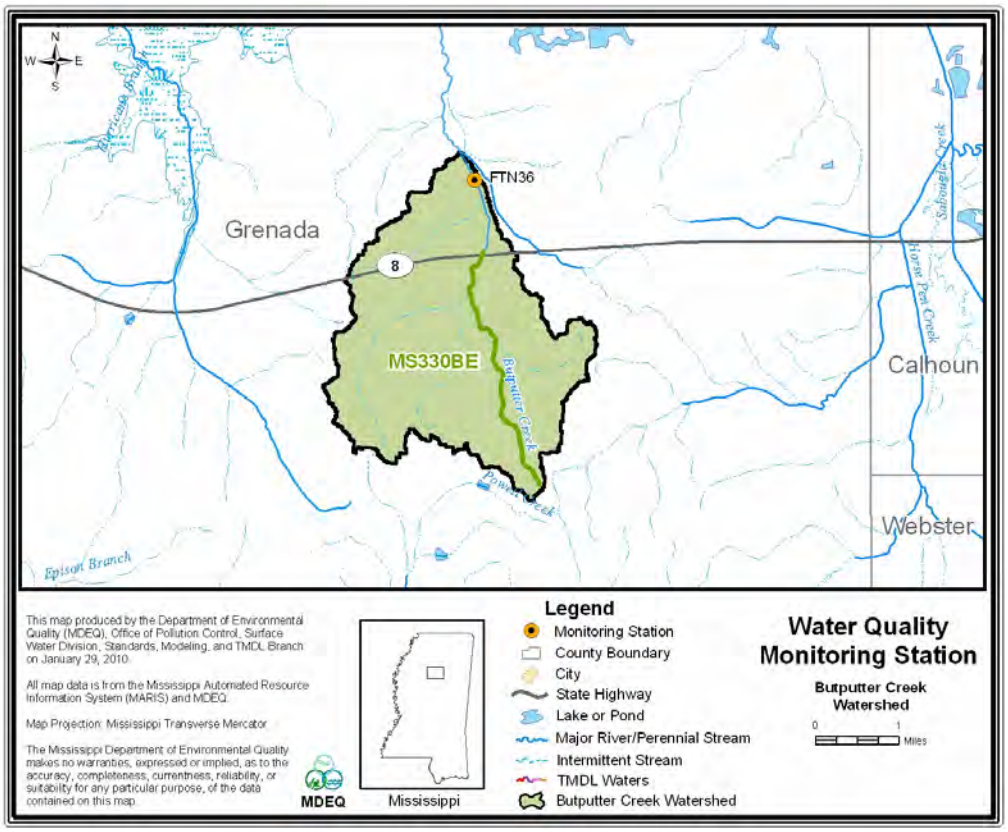


Figure 3. Butputter Creek Segment with Water Quality Gage

The Butputter Creek segment is in Hydrologic Unit Code (HUC) 08030205 in northern Mississippi. The watershed is approximately 4,867 acres (7.6 square miles) and is primarily rural. Forest is the dominant land use within the watershed.

1.2 Applicable Water Body Segment Use

The water use classification for the listed segment of Butputter Creek, as established by the State of Mississippi in the *Water Quality Criteria for Intrastate, Interstate and Coastal Waters* regulation, is Fish and Wildlife Support. The designated beneficial uses for Butputter Creek are Secondary Contact and Aquatic Life Support. Secondary Contact is defined as incidental contact with the water during activities such as wading, fishing and boating, that are not likely to result in full body immersion.

1.3 Applicable Water Body Segment Standard

The water quality standard applicable to the use of the water body and the pollutant of concern is defined in the *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters* (MDEQ, 2007). The standard for fecal coliform is different for summer and winter for a secondary contact use, where summer is defined as the months of May through October, and winter is defined as the months of November through April. For the summer months the fecal coliform colony counts shall not exceed a geometric mean of 200 per 100 ml, based on a minimum of 5 samples taken over a 30-day period with no less than 12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 400 per 100 ml more than 10% of the time. For the winter months, the maximum allowable level of fecal coliform shall not exceed a geometric mean of 2000 colonies per 100 ml, based on a minimum of 5 samples taken over a 30-day period with no less than 12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 4000 per 100 ml more than 10% of the time. This water quality standard was used to assess the data to determine impairment in the water body.

TMDL ENDPOINT AND WATER QUALITY ASSESSMENT

2.1 Selection of a TMDL Endpoint and Critical Condition

One of the major components of a TMDL is the establishment of instream numeric endpoints, which are used to evaluate the attainment of acceptable water quality. Instream numeric endpoints, therefore, represent the water quality goals that are to be achieved by implementing the load and wasteload reductions specified in the TMDL. The endpoints allow for a comparison between observed instream conditions and conditions that are expected to restore designated uses. MDEQ's fecal coliform standard allows for a statistical review of any fecal coliform data set. There are two tests, the geometric mean test and the 10% test, that the data set must pass to show acceptable water quality.

The geometric mean test states that for the summer the fecal coliform colony count shall not exceed a geometric mean of 200 per 100 ml based on a minimum of 5 samples taken over a 30-day period with no less than 12 hours between individual samples and for the winter the fecal coliform colony count shall not exceed a geometric mean of 2000 per 100 ml based on a minimum of 5 samples taken over a 30-day period with no less than 12 hours between individual samples. The 10% test states that for the summer the samples examined during a 30-day period shall not exceed a count of 400 per 100 ml more than 10% of the time and for the winter the samples examined during a 30-day period shall not exceed a count of 4000 per 100 ml more than 10% of the time.

2.1.1 Discussion of the Geometric Mean Test

The level of fecal coliform found in a natural water body varies greatly depending on several independent factors such as temperature, flow, or distance from the source. This variability is accentuated by the standard laboratory analysis method used to measure fecal coliform levels in the water. The membrane filtration (MF) method uses a direct count of bacteria colonies on a nutrient medium to estimate the fecal level. The fecal coliform colony count per 100 ml is determined using an equation that incorporates the dilution and volume to the sample filtered.

The geometric mean test is used to dampen the impact of the large numbers when there are smaller numbers in the data set. The geometric mean is calculated by multiplying all of the data values together and taking the root of that number based on the number of samples in the data set.

$$G = \sqrt[n]{s1 * s2 * s3 * s4 * s5 * sn}$$

The water quality standard requires a minimum of 5 samples be used to determine the geometric mean. MDEQ routinely gathers 6 samples within a 30-day period in case there is a problem with one of the samples. It is conceivable that there would be more samples available in an intensive survey, but typically each data set will contain 6 samples therefore, n would equal 6. For the data set to indicate no impairment, the result must be less than or equal to 200 in summer and 2000 in winter.

2.1.2 Discussion of the 10% Test

The 10% test looks at the data set as representing the 30 days for 100% of the time. The data points are sorted from the lowest to the highest and each value then represents a point on the curve from 0% to 100% or from day 1 to day 30. The lowest value becomes the 1st data point and the highest data point becomes the nth data point. The water quality standard requires that 90% of the time, the counts of fecal coliform in the stream be less than or equal to 400 counts per 100 ml in summer and 4000 counts per 100 ml in winter.

By calculating a concentration of fecal coliform for every percentile point based on the data set, it is possible to determine a curve that represents the percentile ranking of the data set. Once the 90th percentile of the data set has been determined, it may be compared to the standard of 400 counts per 100 ml. If the 90th percentile of the data is greater than 400, then the data violates the criteria and the stream will be considered impaired. This can be used not only to assess actual water quality data, but also computer generated daily average model results. Actual water quality data will typically have 5 or 6 values in the data set, and computer generated model results would have 30 daily values.

2.1.3 Discussion of Combining the Tests

MDEQ determined a theoretical capacity data set that meets both portions of the water quality standard and is indicative of possible water quality conditions. This theoretical capacity data set is shown in Table 1. The theoretical capacity data set was constructed to represent the maximum amount of fecal coliform per day that will still meet both portions of the water quality standard. The theoretical capacity data set was then plotted, generating a theoretical capacity curve. This curve can be seen in Figure 4. The integral of the theoretical capacity curve is used for mass balance TMDL calculations. By multiplying the integral of the theoretical capacity curve by the flow in a given water body, the mass balance TMDL can be calculated.

When actual data violate both portions of the standard, and the data are plotted in a similar way, the resulting curve can be compared to the theoretical capacity curve to determine the percent reduction of fecal coliform necessary for the water body to meet both portions of the water quality standard, the geometric mean test and the 10% test.

Table 1. Theoretical Capacity Data Set

Fecal Coliform (counts/100ml)	Percentile Ranking
37.82	0.0%
52.75	3.4%
65.68	6.9%
79.61	10.3%
93.54	13.8%
107.47	17.2%
121.4	20.7%
135.33	24.1%
149.26	27.6%
163.19	31.0%
177.12	34.5%
191.05	37.9%
204.98	41.4%
218.91	44.8%
232.84	48.3%
246.77	52.7%
260.7	55.2%
274.63	58.6%
288.56	62.1%
302.49	65.5%
316.42	69.0%
330.35	72.4%
344.28	75.9%
358.21	79.3%
372.14	82.8%
386.07	86.2%
400	89.7%
400	93.1%
400	96.6%
400	100.0%

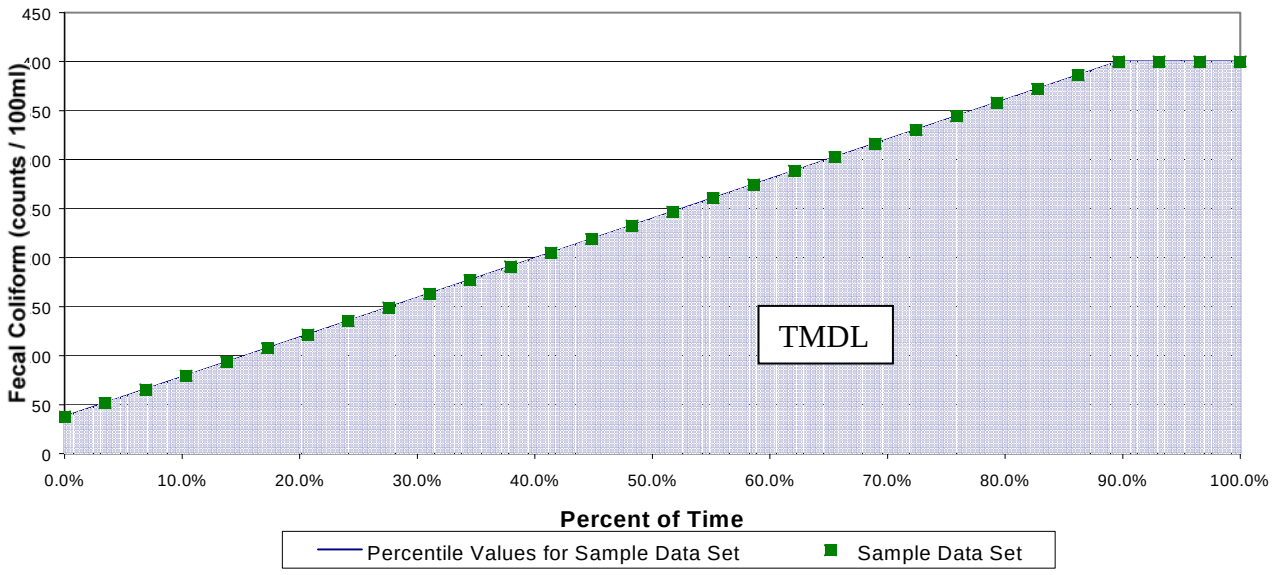


Figure 4. Theoretical Capacity Curve

2.1.4 Discussion of the Targeted Endpoint

While the endpoint of a TMDL calculation is similar to a standard for a pollutant, the endpoint is not the standard. For a mass balance TMDL, the endpoint selected is both portions of the standard, that is the geometric mean test and the 10% test. Meeting the geometric mean test and applying the 10% test to the data sets applies both parts of the standard to an actual data set or to a considered computer generated data set. It is therefore appropriate to select both portions of the standard as the targeted endpoint for the mass balance TMDL.

2.1.5 Discussion of the Critical Condition for Fecal Coliform

Critical conditions for waters impaired by nonpoint sources generally occur during periods of wet weather and high surface runoff. However, critical conditions for point source dominated systems generally occur during periods of low flow, low dilution conditions. Therefore, an examination of the data is needed to determine the critical 30-day period to be used for the TMDL.

2.2 Discussion of Instream Water Quality

Monitoring was performed in a manner consistent with the water quality standards. At least 5 samples were collected in a 30-day period, at Station FTN-36 in segment MS330BE during three summer seasons and two winter season in 2001, 2003, and 2004.

2.2.1 Inventory of Available Water Quality Monitoring Data

The data collected at Station FTN-36 is provided in Tables 2 through 6.

Table 2. Fecal Coliform Data reported in Butputter Creek, Station FTN-36
Summer 2001

Date	Time	Fecal Coliform (counts/100ml)	Geometric Mean	Geometric Mean Test Violation	90th Percentile	10% Test Violation
9/27/2001	11:22	44	115.4	No, geometric mean is <200	384	No, 90th percentile is <400
10/3/2001	12:00	168				
10/9/2001	10:32	34				
10/15/2001	11:51	600				
10/18/2001	10:50	140				
10/24/2001	11:00	112				

Table 3. Fecal Coliform Data reported in Butputter Creek, Station FTN-36
Winter 2001

Date	Time	Fecal Coliform (counts/100ml)	Geometric Mean	Geometric Mean Test Violation	90th Percentile	10% Test Violation
11/15/2001	10:42	46	278.5	No, geometric mean is <2000	3,295	No, 90th percentile is <4000
11/20/2001	11:15	236				
11/27/2001	12:04	6000				
11/30/2001	10:44	590				
12/5/2001	10:33	124				
12/11/2001	11:38	98				

Table 4. Fecal Coliform Data reported in Butputter Creek, Station FTN-36
Winter 2003

Date	Time	Fecal Coliform (counts/100ml)	Geometric Mean	Geometric Mean Test Violation	90th Percentile	10% Test Violation
3/18/2003	10:50	140	114.8	No, geometric mean is <2000	296	No, 90th percentile is <4000
3/24/2003	11:05	82				
3/27/2003	10:15	410				
4/1/2003	11:45	16				
4/4/2003	10:10	120				
4/10/2003	10:50	220				
4/16/2003	11:50	132				

Table 5. Fecal Coliform Data reported in Butputter Creek, Station FTN-36
Summer 2003

Date	Time	Fecal Coliform (counts/100ml)	Geometric Mean	Geometric Mean Test Violation	90th Percentile	10% Test Violation
9/3/2003	9:45	2200	637.6	Yes, geometric mean is >200	2,100	Yes, 90th percentile is >400
9/8/2003	9:45	340				
9/10/2003	10:05	640				
9/15/2003	10:34	260				
9/17/2003	10:45	270				
9/19/2003	10:43	2000				

Table 6. Fecal Coliform Data reported in Butputter Creek, Station FTN-36
Summer 2004

Date	Time	Fecal Coliform (counts/100ml)	Geometric Mean	Geometric Mean Test Violation	90th Percentile	10% Test Violation
8/23/2004	9:40	780	448.0	Yes, geometric mean is >200	720	Yes, 90th percentile is >400
8/25/2004	9:00	265				
8/30/2004	8:55	660				
9/1/2004	8:50	560				
9/7/2004	9:05	460				
9/9/2004	9:00	230				

2.2.2 Analysis of Instream Water Quality Monitoring Data

The data collected during the summer 2003 and 2004 violates the standard. Figures 5 and 6 display the 10% test curves for station FTN-36 during the summer 2003 and 2004 monitoring periods.

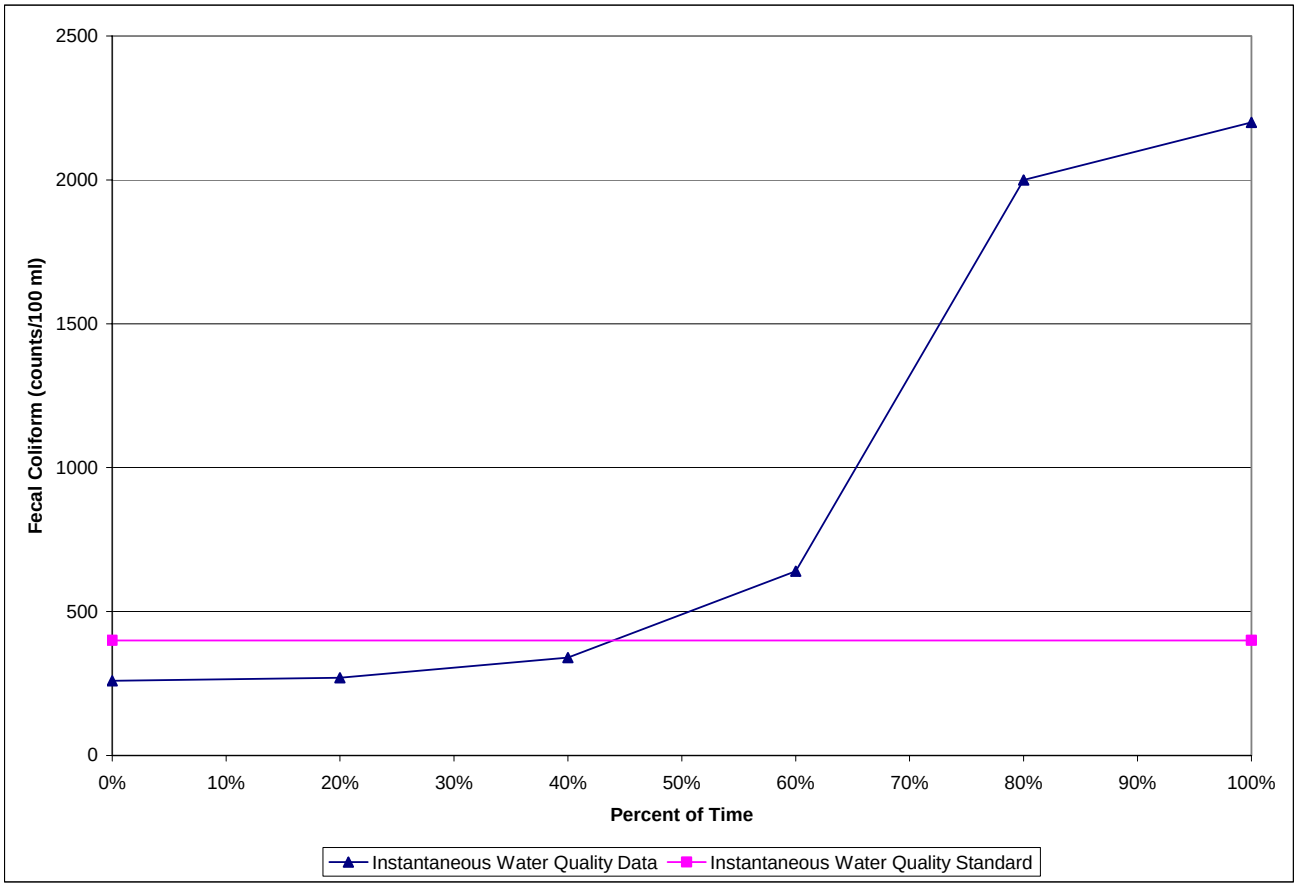


Figure 5. 10% Test Curve for Station FTN-36, Summer 2003

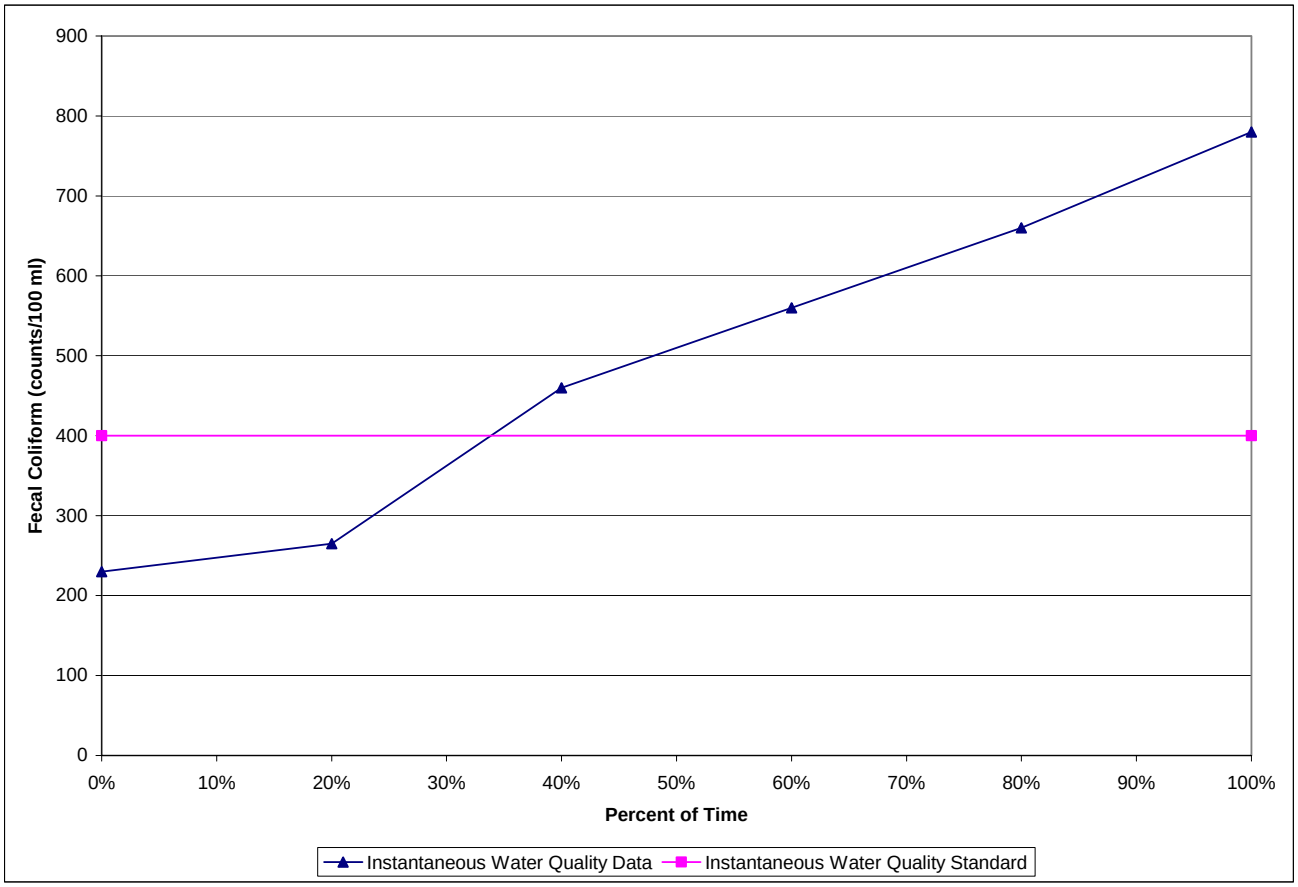


Figure 6. 10% Test Curve for Station FTN-36, Summer 2004

SOURCE ASSESSMENT

The TMDL evaluation summarized in this report examined all known potential fecal coliform sources in the Butputter Creek Watershed. In evaluation of the sources, loads were characterized by the best available information, monitoring data, literature values, and local management activities. This section documents the available information and interpretation for the analysis.

3.1 Assessment of Point Sources

Point sources of fecal coliform bacteria have their greatest potential impact on water quality during periods of low flow. Thus, an evaluation of point sources that discharge fecal coliform bacteria was necessary in order to quantify the degree of impairment present during low flow periods. During the monitoring periods, no NPDES permitted facilities were in the watershed.

3.2 Assessment of Nonpoint Sources

There are many potential nonpoint sources of fecal coliform bacteria for Butputter Creek, including:

- Beef and dairy cattle
- Failing septic systems
- Urban/ developed areas
- Wildlife
- Other direct inputs

The 4,867 acre drainage area of Butputter Creek contains many different land use types, including urban, forest, cropland, pasture, scrub/barren, water, and wetlands. The area directly surrounding the impaired segment, MS330BE, is comprised of mostly forest. The land use distribution for the watershed is provided in Table 7 and displayed in Figure 7. The land use for the Butputter Creek Watershed is gathered from the National Land Cover Database (NLCD). The land use categories were grouped into the following uses: urban, forest, cropland, pasture, scrub/ barren, water, and wetlands.

Table 7. Land Use Distribution (acres)

	Urban	Forest	Cropland	Pasture	Scrub/Barren	Water	Wetland
Area (acres)	214	2,710	442	741	641	12	107
% Area	4.4%	55.7%	9.1%	15.2%	13.2%	0.3%	2.2%

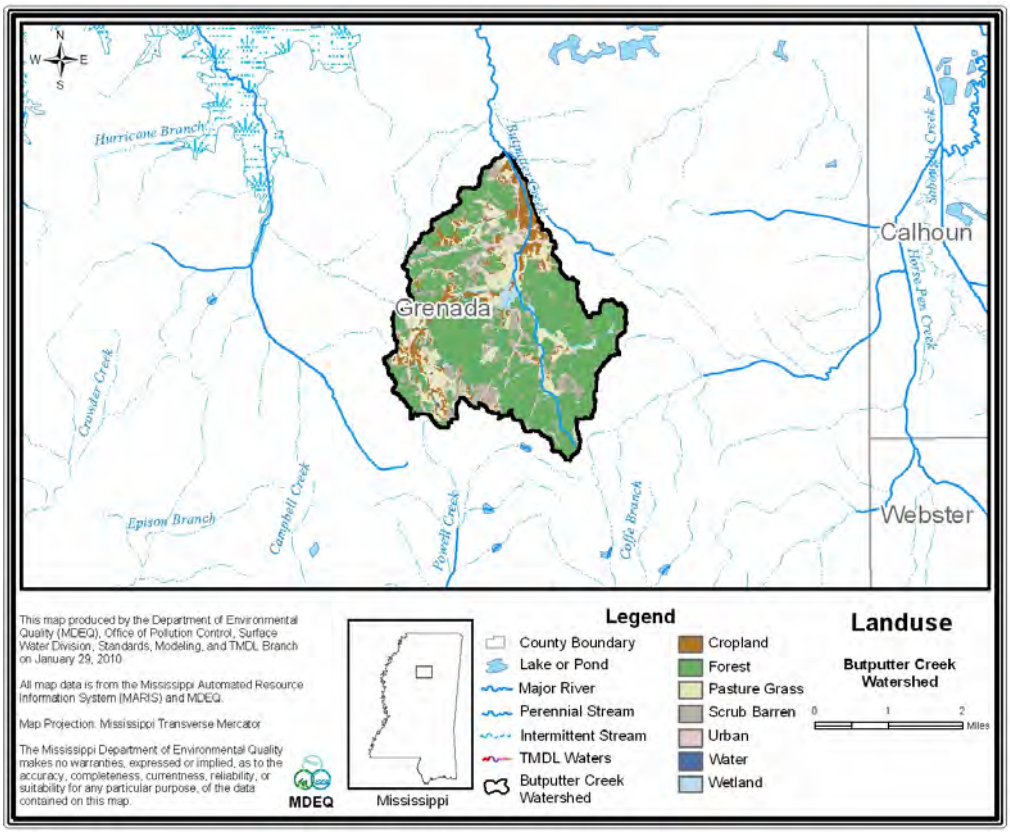


Figure 7. Land Use Distribution Map for the Butputter Creek Watershed

3.2.1 Beef and Dairy Cattle

Grazing cattle deposit manure on pastureland where it is available for wash-off and delivery to receiving water bodies. Beef cattle have access to pastureland for grazing all of the time. For dairy cattle, the dry cattle and heifers have access to pastureland for grazing all of the time. Manure produced by grazing beef and dairy cows is directly deposited onto pastureland and is available for wash off.

Large dairy farms, over 200 head, typically confine the milking herd at all times. Small dairy farms confine the lactating cattle for a limited time during the day for milking and feeding. The manure collected during confinement is applied to the available pastureland in the watershed. Application rates of dairy cow manure to pastureland vary monthly according to management practices currently used in this area.

The *2007 Census of Agriculture* (USDA, 2008) produced by the National Agriculture Statistics Service (NASS) was used estimate the number of cattle in the watershed. The cattle are primarily beef cattle, heifers, steers, and bulls. The Butputter Creek Watershed is in Grenada County. In Grenada County, there are 93 farms with a total of 6,327 head of cattle. 5 farms have greater than 200 head of cattle and of those, 2 have greater than 500 head of cattle. There has been a 20.7% decrease in the cow population in Grenada County since the 2002 census.

3.2.2 Land Application of Hog Manure

Processed manure from confined hog operations is usually collected in lagoons and routinely applied to pastureland according to the management practices used in the area. The amount of the manure application is determined by the nitrogen uptake of the plant being sprayed. The frequency is determined by rain events so that the waste is not sprayed on saturated ground or just prior to a rain event to minimize runoff. Another factor in the application of the manure is pumping the lagoons often enough to avoid a lagoon overflow. Also, the waste is not land applied during the winter months when there is no forage or crop being grown. This manure is a potential contributor of bacteria to receiving water bodies due to runoff produced during a rain event.

Data from the *2007 Census of Agriculture* (USDA, 2009) produced by the NASS indicate there are no hog farms in Grenada County.

3.2.3 Land Application of Poultry Litter

Predominantly, two kinds of chickens are raised on farms in the Yazoo River Basin, broilers and layers. For the broiler chickens, the amount of growth time from when the chicken is born to when it is sold off the farm is approximately 48 days or 1.6 months. Broiler chickens are confined in poultry houses all of the time. Typically, the dry waste accumulated in the poultry houses is "de-caked" between flocks unless a disease situation warrants clean-out before the change of flocks. During "de-caking", approximately the top two inches of litter is removed. Every year or two, the middle third of the poultry house is removed and the remaining litter is spread evenly in the house. The majority of the litter is used as a fertilizer on hay and row crops and may be used in areas of the state other than the location of the poultry houses. The litter is applied in the spring, summer, and early fall and rates are determined by a phosphorous index.

Layer chickens are confined at all times and remain on farms for ten months or longer. Large scale layer operations collect the chicken waste in a lagoon and periodic spray applies the waste to corn fields. The application rates vary monthly from the spring through the early fall. There are 12 small poultry farms in Grenada County including layers, turkeys, ducks, geese, and other poultry. The total poultry population is less than 500 birds in the county.

3.2.4 Failing Septic Systems

Septic systems have a potential to deliver fecal coliform bacteria loads to surface waters due to malfunctions, failures, and direct pipe discharges. Properly operating septic systems treat and dispose of wastewater through a series of underground field lines. The water is applied through these lines into a rock substrate, thence into underground absorption. The systems can fail when the field lines are broken, or when the underground substrate is clogged or flooded. A failing septic system's discharge can reach the surface, where it becomes available for wash-off into the stream. Another potential problem is a direct bypass from the system to a stream. In an effort to keep the water off the land, pipes are occasionally placed from the septic tank or the field lines directly to the creek.

Another consideration is the use of individual onsite wastewater treatment plants. These treatment systems are in wide use in Mississippi. They can adequately treat wastewater when properly maintained. However, these systems may not receive the maintenance needed for proper, long-term operation. These systems require some sort of disinfection to properly operate. When this expense is ignored, the water

does not receive adequate disinfection prior to release.

Septic systems have an impact on nonpoint source fecal coliform impairment in the Yazoo River Basin. The best management practices needed to reduce this pollutant load need to prioritize eliminating septic tank failures and improving maintenance and proper use of individual onsite treatment systems.

3.2.5 Urban / Developed Areas

Land classified as urban in the Butputter Creek Watershed is primarily representative of transportation corridors and does not represent land use activities associated with urban/ developed areas that would contribute fecal coliform.

3.2.6 Wildlife

Wildlife present in the Butputter Creek Watershed contributes to fecal coliform bacteria on the land surface which is then available for wash-off and delivery to receiving water bodies. Some form of wildlife may be present on all land uses within the watershed. Also, wildlife is present throughout the year.

3.2.7 Other Direct Inputs

Other direct inputs of fecal coliform bacteria to water bodies in the Butputter Creek Watershed could include illicit discharges, human recreation, leaking sewer collection lines, and access of both domestic and wild animals to the stream.

MASS BALANCE PROCEDURE

Establishing the relationship between the instream water quality target and the source loading is a critical component of TMDL development. It allows for the evaluation of management options that will achieve the desired source load reductions. Ideally, the linkage will be supported by monitoring data that allow the TMDL developer to associate certain water body responses to flow and loading conditions. In this section, the selection of the modeling tools, setup, and model application are discussed.

4.1 Modeling Framework Selection

A mass balance approach was used to calculate the TMDL for segment MS330BE. This method of analysis was selected because data limitations precluded the use of more complex methods. The mass balance approach is suitable for this TMDL.

4.2 Calculation of the Allowable Load

The mass balance approach utilizes the conservation of mass principle. Loads can be calculated by multiplying the fecal coliform concentration in the water body by the flow. The principle of the conservation of mass allows for the addition and subtraction of those loads to determine the appropriate numbers necessary for the TMDL. The loads can be calculated using the following relationship:

$$\text{Load}(\textit{counts per day}) = \text{AverageDailyCapacity}\left(\frac{\text{day}\cdot\text{counts}}{100\,\text{ml}}\right)\times\text{Flow}(\text{cfs})^{*}\text{ConversionFactor}$$

$$\text{when Conversion Factor} = \left(\frac{28316.8\text{ml}}{\text{ft}^3}\right)\times\left(\frac{100\text{ml}}{100\text{ml}}\right)\times\left(\frac{60\text{s}}{1\text{min}}\right)\times\left(\frac{60\text{min}}{1\text{hr}}\right)\times\left(\frac{24\text{hr}}{1\text{day}}\right)$$

$$= 2.45E+07\left(\frac{100\,\text{ml}\cdot\text{s}}{\text{ft}^3\cdot\text{day}}\right)$$

The first step in calculating the average daily capacity is to calculate the theoretical 30 day capacity, as shown in the equation below, by taking the integral of the theoretical capacity curve shown in Figure 4.

$$\int_{0}^{26.91}\left[13.47x+37.82\right]\text{dx}+\int_{26.91}^{30}400\,\text{dx}=\mathbf{7129.4}\,(\text{day}^{*}\text{counts}/100\,\text{ml})$$

The average daily capacity is then computed by dividing the theoretical 30 day capacity by 30.

$$\text{Average Daily Capacity}=\left(\frac{\mathbf{7129.4}\,(\text{day}^{*}\text{counts}/100\,\text{ml})}{30}\right)=237.65\,(\text{day}^{*}\text{counts}/100\,\text{ml})$$

The average annual flow was found in the National Hydrograph Dataset which is 10.7 cfs.

4.3 Calculation of the Percent Reduction

For the calculation of the percent reduction, the area under the 10% Test Curve for each season that violates both portions of the standard (Section 2.2.2) is computed and then compared to the area under the Theoretical Capacity Curve, Figure 4. The necessary percent reduction based on the observed data for each season is then calculated using the equation below. This method of calculating the percent reduction allows the data set to be compared to both portions of the water quality standard at the same time. Thus, the calculated percent reduction represents the reduction needed in order for the data set to meet both portions of the water quality standard.

$$\text{Percent Reduction} = \left(1 - \frac{\text{Theoretical Capacity Curve Area}}{\text{10\% Test Curve Area}}\right) * 100$$

For a season which only violates one portion of the standard, the percent reduction will only be based on the violating portion. The percent reduction calculation for a data set that violates the geometric mean portion of the standard follows.

$$\text{Percent Reduction} = \left(1 - \frac{\text{Geometric Mean of 200 mg/L}}{\text{Actual Greometric Mean of Violating Data Set}}\right) * 100$$

The same could be done for a data set that only violates the 10% of the time portion of the standard.

ALLOCATION

The allocation for this TMDL includes a wasteload allocation (WLA) for point sources, a load allocation (LA) for nonpoint sources, and a margin of safety (MOS).

5.1 Wasteload Allocations

There are no NPDES point sources in the Butputter Creek Watershed. Future permits will be considered in accordance with Mississippi's *Wastewater Regulations for National Pollutant Discharge Elimination System (NPDES) Permits, Underground Injection Control (UIC) Permits, State Permits, Water Quality Based Effluent Limitations and Water Quality Certification*.

5.2 Load Allocations

The load allocation for segment MS330BE is calculated using the water quality criteria and the average annual flow. The load allocation is assumed to represent nonpoint sources as described in Section 3.2. In calculating the LA component, the total TMDL for the water body is reduced by a 10% MOS and the WLA component. For this TMDL, the load is based on the average daily capacity and the average annual flow of 10.7 cfs. The resulting LA is estimated to be 5.61E+10 counts per day.

LA = 0.9*237.65(day*counts/100ml)* 10.7(cfs) * 2.45E+07[(100ml*s)/(ft^3 *day)] –0.00E+00 WLA

LA = 5.61E+10 (counts per day)

5.3 Incorporation of a Margin of Safety (MOS)

The two types of MOS development are to implicitly incorporate the MOS using conservative assumptions or to explicitly specify a portion of the total TMDL as the MOS. For segment MS330BE, reducing the TMDL by 10% explicitly specifies the MOS. Assuming the average flow, the resulting load attributed to the MOS is 6.23E+09 counts per day.

MOS = 0.1*237.65(day*counts/100ml)* 10.7(cfs) * 2.45E+07[(100ml*s)/(ft^3*day)]

MOS = 6.23E+09 (counts per day)

5.4 Calculation of the TMDL

The TMDL for segment MS330BE is calculated based on the following equation:

TMDL = WLA + LA + MOS

where WLA is the Wasteload Allocation, LA is the Load Allocation, and MOS is the Margin of Safety.

WLA = NPDES Permitted Facilities

LA = Surface Runoff + Other Direct Inputs

MOS = 10% explicit

The TMDL for segment MS330BE was calculated based on the average flow of the water body, and the average daily capacity. The necessary summer percent reduction of fecal coliform to segment MS330BE is a maximum of 73.5%. This is based on the data from the summer in 2003, the most critical of the two data sets.

TMDL = 237.65(day*counts/100ml)* 10.7(cfs) * 2.45E+07[(100ml*s)/(ft^3*day)]

TMDL = 6.23E+10 (counts per day)

Table 8. TMDL Summary for Segment MS330BE (counts per day)

WLA	0.00E+00
LA	5.61E+10
MOS	6.23E+09
TMDL = WLA + LA +MOS	6.23E+10

5.5 Seasonality

For many streams in the state, fecal coliform limits vary according to the seasons. This stream is designated for the use of secondary contact. For this use, the fecal coliform standard is seasonal. The criteria for the most critical season, which is the summer for Butputter Creek, was used as the target for this TMDL. The winter season did not violate the standard.

5.6 Reasonable Assurance

This component of TMDL development does not apply to this TMDL Report. There is no WLA reduction request based on promised LA components and reductions.

CONCLUSION

The TMDL will not impact future NPDES Permits as long as the effluent is disinfected to meet water quality standards for fecal coliform. MDEQ will not approve any NPDES Permit application that does not plan to meet water quality standards for fecal coliform. Education projects that teach best management practices should be used as a tool for reducing nonpoint source contributions. These projects may be funded by CWA Section 319 Nonpoint Source (NPS) Grants.

6.1 Future Monitoring

MDEQ has adopted the Basin Approach to Water Quality Management, a plan that divides Mississippi's major drainage basins into four groups. During each year long cycle, MDEQ resources for water quality monitoring will be focused on one of the basin groups. During the next monitoring phase in the Yazoo River Basin, Butputter Creek may receive additional monitoring to identify any change in water quality. MDEQ produced guidance for future Section 319 project funding will encourage NPS restoration projects that attempt to address TMDL related issues within Section 303(d)/TMDL watersheds in Mississippi.

6.2 Public Participation

This TMDL will be published for a 30-day public notice. During this time, the public will be notified by publication in the statewide newspaper. The public will be given an opportunity to review the TMDLs and submit comments. MDEQ also distributes all TMDLs at the beginning of the public notice to those members of the public who have requested to be included on a TMDL mailing list. Anyone wishing to become a member of the TMDL mailing list should contact Greg Jackson at gjackson@deq.state.ms.us.

All comments should be directed to Greg Jackson at gjackson@deq.state.ms.us or Greg Jackson, MDEQ, PO Box 2261, Jackson, MS 39225. All comments received during the public notice period and at any public hearings become a part of the record of this TMDL and will be considered in the submission of this TMDL to EPA Region 4 for final approval.

DEFINITIONS

Ambient stations: a network of fixed monitoring stations established for systematic water quality sampling at regular intervals, and for uniform parametric coverage over a long-term period.

Assimilative capacity: the capacity of a natural body of water to receive wastewaters or toxic materials without deleterious effects and without damage to aquatic life or humans who use the water.

Background: the condition of waters in the absence of man-induced alterations based on the best scientific information available to MDEQ. The establishment of natural background for an altered water body may be based upon a similar, unaltered or least impaired, water body or on historical pre-alteration data.

Calibrated model: a model in which reaction rates and inputs are significantly based on actual measurements using data from surveys on the receiving water body.

Critical Condition: hydrologic and atmospheric conditions in which the pollutants causing impairment of a water body have their greatest potential for adverse effects.

Daily discharge: the discharge of a pollutant measured during a 24-hour period that reasonably represents the day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day.

Designated Uses: (1) those uses specified in the water quality standards for each water body or segment whether or not they are being attained. (2) those water uses identified in state water quality standards which must be achieved and maintained as required under the Clean Water Act. Uses can include public water supply, recreation, etc.

Discharge monitoring report (DMR): the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees.

Effluent: wastewater – treated or untreated – that flows out of a treatment plant or industrial outfall. Generally refers to wastes discharged into surface waters.

Effluent limitation: (1) any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance. (2) restrictions established by a State or EPA on quantities, rates, and concentrations in wastewater discharges.

Effluent standard: any effluent standard or limitation, which may include a prohibition of any discharge, established or proposed to be established for any toxic pollutant under section 307(a) of the Act.

Fecal Coliform Bacteria: (1) those organisms associated with the intestines of warm-blooded animals that are commonly used to indicate the presence of fecal material and the potential presence of organisms capable of causing human disease. (2) bacteria found in the intestinal tracts of mammals. Their presence in water or sludge is an indicator of pollution and possible contamination by pathogens.

Geometric mean: the *n*th root of the production of n factors. A 30-day geometric mean is the 30^{th} root of the product of 30 numbers.

Impaired Water Body: any water body that does not attain water quality standards due to an individual pollutant, multiple pollutants, pollution, or an unknown cause of impairment.

Land Surface Runoff: water that flows into the receiving stream after application by rainfall or irrigation. It is a transport method for nonpoint source pollution from the land surface to the receiving stream.

Load allocation (LA): the portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loads should be distinguished.

Loading: the introduction of waste into a waste management unit but not necessarily to complete capacity.

Mass Balance: a concept based on a fundamental law of physical science (conservation of mass) which says that matter can not be created or destroyed. It is used to calculate all input and output streams of a given substance in a system.

Model: a quantitative or mathematical representation or computer simulation which attempts to describe the characteristics or relationships of physical events.

National pollutant discharge elimination system (NPDES): the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under section 307, 402, 318, and 405 of the Clean Water Act.

Nonpoint Source: the pollution sources which generally are not controlled by establishing effluent limitations under section 301, 302, and 402 of the Clean Water Act. Nonpoint source pollutants are not traceable to a discrete identifiable origin, but generally result from land runoff, precipitation, drainage, or seepage.

Outfall: the point where an effluent is discharges into receiving waters

Point Source: a stationery location or fixed facility from which pollutants are discharges or emitted. Also, any single identifiable source of pollution, e.g., a pipe, ditch, ship, ore pit, factory smokestack.

Pollution: generally, the presence of matter or energy whose nature, location or quantity produces undesired environmental effects. Under the Clean Water Act, for example, the term is defined as the man-made or man-induced alteration of the physical, biological, and radiological integrity of water.

Publicly Owned Treatment Works (POTW): the treatment works treating domestic sewage that is owned by a municipality or State.

Regression: a relationship of y and x in a function of y = f(x), where: y is the expected value of an independent random variable x. The parameters in the function f(x) are determined by the method of least squares. When f(x) is a linear function of x, the term linear regression is used.

Regression Coefficient: a quantity that describes the slope and intercept of a regression line.

Scientific Notation (Exponential Notation): mathematical method in which very large numbers or very small numbers are expressed in a more concise form. The notation is based on powers of ten. Numbers in scientific notation are expressed as the following: *4.16 x 10^(+b)* and *4.16 x 10^(-b) [same as 4.16E4 or4.16E-4]*. In this case, *b* is always a positive, real number. The *10^(+b)* tells us that the decimal point is *b* places to the right of where it is shown. The *10^(-b)* tells us that the decimal point is *b* places to the left of where it is shown.

For example: $2.7X10^{4} = 2.7E+4 = 27000$ and $2.7X10^{-4} = 2.7E-4 = 0.00027$.

Sigma (Σ): shorthand way to express taking the sum of a series of numbers. For example, the sum or total of three amounts 24, 123, 16, ($\mathbf{d}_1$, $\mathbf{d}_2$, $\mathbf{d}_3$) respectively could be shown as:

$$\sum_{i=1}^{3} d_i = d_1+d_2+d_3 = 24+123+16 = 163$$

Total Maximum Daily Load or TMDL: (1) the calculated maximum permissible pollutant loading introduced to a water body such that any additional loading will produce a violation of water quality standards. (2) the sum of the individual wasteload allocations and load allocations. A margin of safety is included with the two types of allocations so that any additional loading, regardless of source, would not produce a violation of water quality standards.

Waste: (1) useless, unwanted or discarded material resulting form (agricultural, commercial, community and industrial) activities. Wastes include solids, liquids, and gases. (2) any liquid resulting from industrial, commercial, mining, or agricultural operations, or from community activities that is discarded or is being accumulated, stored, or physically, chemically, or biologically treated prior to being discarded or recycled.

Wasteload allocation (WLA): (1) the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality based effluent limitation. (2) the portion of a receiving water's total maximum daily load that is allocated to one of its existing or future point source of pollution. (3) the maximum load of pollutants each discharger of waste is allowed to release into a particular waterway. Discharge limits are usually required for each specific water quality criterion being, or expected to be, violated. The portion of a stream's total assimilative capacity assigned to an individual discharge.

Water Quality Standards: State-adopted and EPA-approved regulations mandated by the Clean Water Act and specified in 40 CFR 131 that describe the designated uses of a water body, the numeric and narrative water quality criteria designed to protect those uses, and an antidegredation statement to protect existing levels of water quality. Standards are designed to safeguard the public health and welfare, enhance the quality of water and serve the purposes of the Clean Water Act.

Water quality criteria: numeric water quality values and narrative statements which are derived to protect designated uses. Numeric criteria are scientifically-derived ambient concentrations developed by EPA or States for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal. Ambient waters that meet applicable water quality criteria are considered to support their designated uses.

Waters of the State: all waters within the jurisdiction of this State, including all streams, lakes, ponds, wetlands, impounding reservoirs, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, situated wholly or partly within or bordering upon the State, and such coastal waters as are within the jurisdiction of the State, except lakes, ponds, or other surface waters which are wholly landlocked and privately owned, and which are not regulated under the Federal Clean Water Act (33 U.S.C.1252 et seq.).

Watershed: (1) the land area that drains (contributes runoff) into a stream. (2) the land area that drains into a stream; the watershed for a major river may encompass a number of smaller watersheds that ultimately combine at a common delivery point.

ABBREVIATIONS

BMP ..... Best Management Practice

CAFO ..... Concentrated Animal Feeding Operation

CWA ..... Clean Water Act

DMR..... Discharge Monitoring Report

EPA ..... Environmental Protection Agency

GIS ..... Geographic Information System

HCR..... Hydrograph Controlled Release

HUC ..... Hydrologic Unit Code

LA ..... Load Allocation

MARIS ..... Mississippi Automated Resource Information System

MDEQ ..... Mississippi Department of Environmental Quality

MOS ..... Margin of Safety

NRCS ..... National Resource Conservation Service

NPDES ..... National Pollution Discharge Elimination System

UNT..... Unnamed Tributary

USGS..... United States Geological Survey

WLA..... Wasteload Allocation

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