FINAL
MAINTENANCE OF EROSION CONTROL FEATURES AND VEGETATION LETTER REPORT OF ACTIVITIES, YEAR 4, EVENT 1

FORMER 81MM MORTAR RANGE, BAINS GAP ROAD RANGES, FORMER CHOCCOLOCCO CORRIDOR RANGES, AND RANGES NEAR TRAINING AREA T-24A

ENVIRONMENTAL REMEDIATION SERVICES AT FOUR SITES, FORT MCCLELLAN, ANNISTON, ALABAMA

Prepared for:

U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602

Contract No. W912DY-10-D-0023
Task Order No: CK01

Prepared by:

HydroGeoLogic, Inc.
85 NE Loop 410, Suite 605
San Antonio, Texas 78216

February 2019

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February 13, 2019

Melissa L. Shirley, P.E.
Contracting Officer Representative
U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, AL 36602

Re: Maintenance of Erosion Control Features and Vegetation Letter Report of Activities (FINAL), Year 4, Event 1, *Former 81MM Mortar Range*, Environmental Remediation Services at Four Sites, Fort McClellan, Anniston, AL
Contract: W912DY-10-D-0023, Task Order No. CK01
HGL Project Number: H10501

Dear Ms. Shirley:

HydroGeoLogic, Inc. (HGL) is pleased to submit this letter report documenting the activities associated with maintenance of erosion control features and vegetation at the Former 81mm Mortar Range (81MM) at the former Fort McClellan (FTMC) in Anniston, Alabama. This report covers Year 4, Event 1, and documents erosion control and vegetation maintenance efforts undertaken since the previous maintenance event for the site under the above-referenced project. This documentation supports Project Milestone 422.01 as described in the PMP/QASP and project schedule and will serve as backup for invoicing purposes.

BACKGROUND AND OBJECTIVES

The former FTMC occupied 45,679 acres in the foothills of the Appalachian Mountains of northeastern Alabama, near the City of Anniston in Calhoun County. FTMC is approximately 74 miles (119 km) north-northeast of Birmingham, Alabama, and consists of three tracts of land: The Main Post, the Choccolocco Corridor, and Pelham Range. The former FTMC is not a National Priorities List site under the Comprehensive Environmental Response, Compensation, and Liability Act, 42 United States Code Annotated §9605.

81MM is in the northeast corner of the former FTMC main post. The site is currently owned by the U.S. Fish and Wildlife Service (USFWS) and located within the boundaries of the Mountain Longleaf National Wildlife Refuge. The range first appears on a 1958 range map, but by 1967, the range had been abandoned. The history of ordnance used at 81MM is unknown; however, an expended 81-mm high explosive mortar round was found on the range. Site reconnaissance and previous studies have shown historical evidence of former small arms range activities, trenches, and other features; however, no evidence was uncovered that this area was ever used as an 81-mm mortar range (CB&I, 2013). 81MM consists of a single parcel.

A Remedial Action (RA) consisting of site preparation; XRF screening and analysis for contaminant delineation; excavation of metals-contaminated soil and soil stabilization as necessary; post-excavation confirmation sampling and analysis; waste characterization sampling and analysis; transportation and disposal of waste soil; backfilling and re-grading; and site re-vegetation was undertaken from October 2015 through June 2016, with follow-up planting of permanent vegetation in Fall 2016.

This event is one of six events for follow-up inspection and maintenance of erosion controls and vegetation ("maintenance phase"). The objective of the maintenance phase is to ensure that the areas of the site impacted by the RA construction are controlled to prevent erosion and sediment runoff from the site to the maximum extent practicable through inspection of vegetation and remaining engineered erosion control features, with corrective maintenance as necessary. The six events include:

- Year 3, Event 1 – completed July 2017
- Year 3, Event 2 – completed April 2018
- Year 4, Event 1 – completed from August 2018 to November 2018
- Year 4, Event 2 – on or about December 12, 2018
- Year 5, Event 1 – on or about March 16, 2019
- Year 5, Event 2 - on or about August 18, 2019

This letter report incorporates routine maintenance activities at 81MM occurring for Year 4, Event 1.

SUMMARY OF ACTIVITIES AND OPERATIONS PERFORMED

Erosion Controls:

Attachment 1 shows the configuration of erosion controls remaining at the site. Each of the remaining controls was inspected during Year 4, Event 1 on 11 September 2018 and found to be in good working order, except for the following maintenance activities performed by APTIM during the maintenance cycle in November 2018:

- Replaced the sediment logs along the haul road with a low rock wall to drop out sediment from road runoff before flowing into the natural forest (i.e., buffer area).

Vegetation:

Temporary Vegetation:

No longer applicable. The vegetation at the site was inspected during the event and all areas were observed to be completely or sufficiently covered with permanent vegetation except as described below for the Lower Laydown Area.

Permanent Vegetation:

Inspections of 81MM were conducted on 8 August 2018. The objective of these inspections was to identify any eroded areas which required repair and to identify areas where permanent vegetation did not cover 100% of the soil surface with a density of 85% or greater as defined by the Construction Best Management Practices Plan (CBMPP). A site plan showing the inspected areas and vegetation progress is included as Attachment 2.

Vegetation progressed nicely in many areas since the previous maintenance event, including Areas 1, 2, and 10, which were determined to meet the requirements for completeness. Area 4 was observed to have a good stand of vegetation and close to complete but was contaminated with non-native Johnson Grass. The Johnson Grass was treated with a glyphosate herbicide on 20 August, with a follow-up inspection indicating a favorable response. Area 7/8/9 was observed to be completely covered with vegetation, but not completely filled in at the full density. No action was deemed necessary, as it is expected to continue filling in after a natural reseeding cycle. The lower laydown area continues to struggle with approximately 50 percent coverage. It is believed that the combination of weathering and compacted soil there

is inhibiting vegetation growth. Based on the results of longleaf pine inspection at Bains Gap Road Ranges, HGL will be replanting the lower laydown area with longleaf pines.

Turbidity Monitoring:

HGL continued to inspect the site and monitor turbidity during the maintenance period in accordance with the CBMPP at each of the primary turbidity sampling points identified in Attachment 1. No turbidity issues were noted during the maintenance period. HGL will continue monitoring turbidity until the site is fully vegetated at the specified requirements.

FINDINGS SUMMARY

Year 4, Event 1 inspections of 81MM identified no active erosion, and all areas are completely covered with a mixture of active and dormant permanent vegetation. Turbidity measurements for applicable rainfall events have shown no issues that exceed State of Alabama Construction General Permit requirements (delta of 50 NTUs between background and turbidity monitoring points).

As noted above, multiple areas reached completion, while several others will require further observation or activity. A synopsis of 81MM sub-areas, vegetation date, and percent vegetation completion is included as Attachment 3.

Major activities/findings are summarized below:

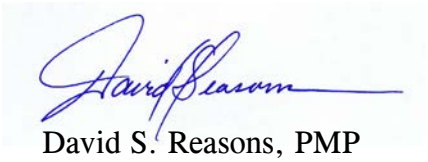
- Permanent vegetation now uniformly covers 100% of the soil surface with a density of 85% or greater at Areas 1, 2, 3, and 10 at the site. These areas have been inspected and approved by U.S. Army Corps of Engineers as well, and no additional action was required.
- Areas 4 and 7/8/9 were observed to have a high survival rate of current permanent vegetation and are expected to continue to fill in naturally. No action was required in these areas.
- The Lower Laydown area was observed to continue to lag in vegetation growth and the next maintenance event will replant this area with longleaf pines.
- No work was performed at the Upper Laydown area, as it was determined to be the responsibility of an outside contractor and removed from the contract.

CONCLUSIONS

The erosion controls at the site continue to perform as intended and the site is protected from erosion with a cover of permanent vegetation in all areas with the exception of the Lower Laydown Area as described, which is being replanted with longleaf pines. HGL will continue to monitor progress of vegetation growth at the site and will address any erosion issues or vegetation of remediated areas in accordance with the previously noted maintenance schedule.

Please call or email me at (210) 477-2215, dreasons@hgl.com should you have any questions or comments concerning this document.

Sincerely,



David S. Reasons, PMP
Project Manager

Attachments:

1. Final Restoration Figure
2. Vegetation Inspection Areas Figure (Annotated)
3. 81MM Permanent Vegetation Tracking Table

cc: Jeffrey Tarr, APTIM
James O'Quinn, HydroGeoLogic, Inc.
Linda Bookout, USACE Mobile
Owen Nuttall, FTMC Army Transition Force
Lisa Holstein, FTMC Army Transition Force
Bill Shanks, FTMC Army Transition Force

ATTACHMENTS

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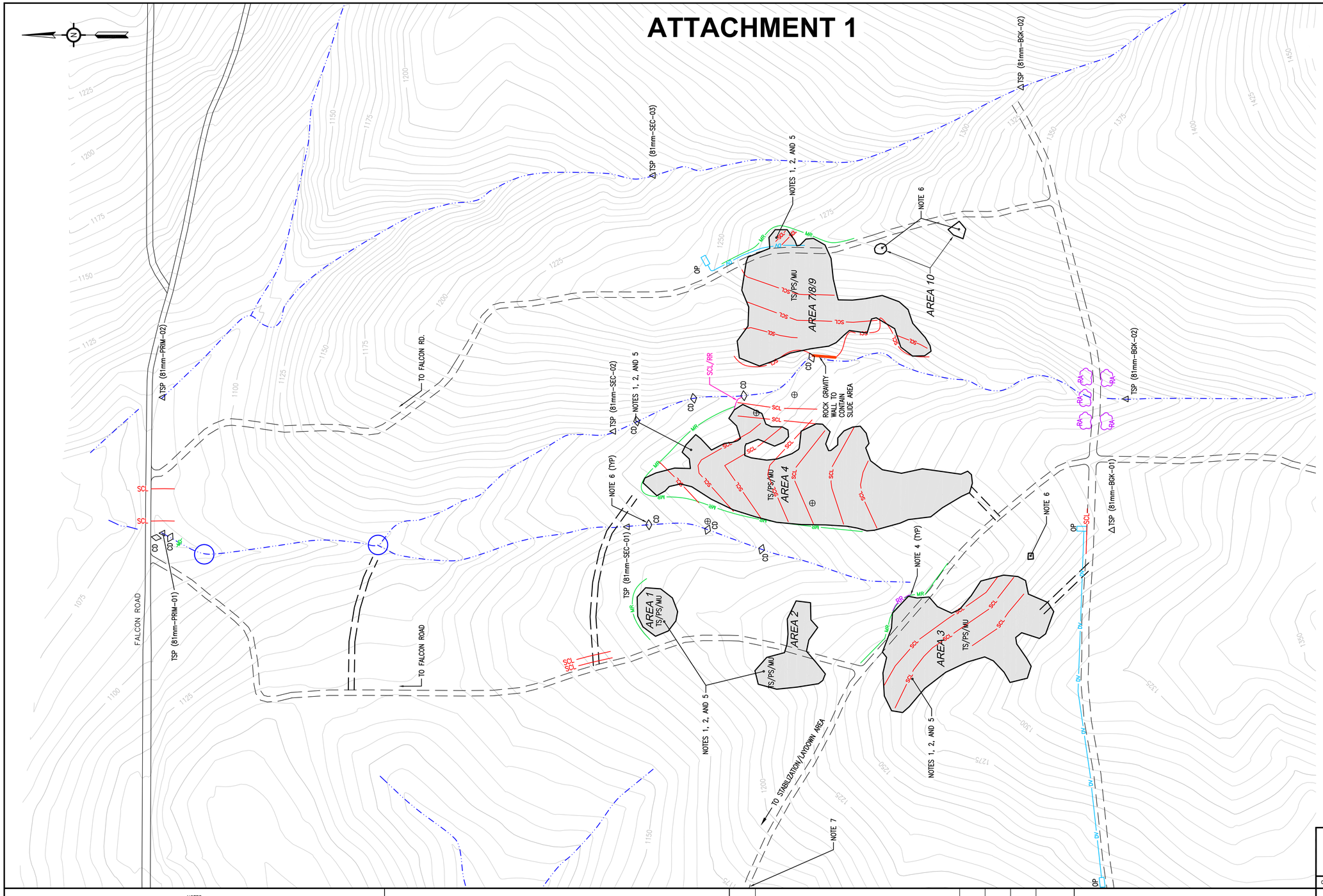
ATTACHMENT 1



LEGEND:

- EXISTING IMPROVED ROAD
- EXISTING UNIMPROVED ROAD
- TEMPORARY ROAD
- EXCAVATION BOUNDARY
- HYDROMULCH WITH TENSAR™ HYDRA CX EXTREME SLOPE MATRIX OR EQUAL.
- 1150 — TOPOGRAPHIC CONTOUR
- STREAM
- MR — SEDIMENT BARRIER (MULCH ROW)
- MD — SEDIMENT BARRIER (MULCH DAM)
- SCL — SEDIMENT BARRIER (SEDIMENT CONTROL LOG)
- RR/SCL — SEDIMENT BARRIER (SEDIMENT CONTROL LOG/ROCK ROW)
- RR — SEDIMENT BARRIER (ROCK ROW)
- RA — SEDIMENT BARRIER (ROCK ARMORING)
- DV — DIVERSION
- ◊ — ROCK CHECK DAM (CD)
- □ — OUTLET PROTECTION (OP)
- ⊕ — MONITORING WELL
- △ — TURBIDITY SAMPLING POINT (TSP)
- (MU) — MULCHING
- ◯ — PLUNGE POOL
-][— TEMPORARY STREAM CROSSING (TSC)
- TS/PS/MU — TEMPORARY SEEDING/PERMANENT SEEDING/MULCHING

NOTES:

1. TEMPORARY AND PERMANENT SEED MIX.
2. HYDROMULCH WITH TENSAR™ HYDRA GX EXTREME SLOPE MULCH BLEND OR EQUAL.
3. SEDIMENT BARRIERS TO REMAIN IN PLACE DURING RESTORATION. REMOVE AFTER ARMY APPROVAL OF FINAL STABILIZATION IF REQUESTED BY USFWS.
4. IRRIGATE AND MAINTAIN SEEDED AREAS UNTIL ESTABLISHING A HEALTHY STAND OF VEGETATION.
5. CHECK DAMS, DIVERSION AND OUTLET PROTECTION, AND CONSTRUCTION EXIT PADS TO REMAIN IN PLACE OR MODIFIED AND/OR REMOVED AS DIRECTED BY USFWS.
6. MULCH AND TEMPORARY SEED MIX.
7. IN NOVEMBER 2018, SEDIMENT LOGS ALONG THE FORMER HAUL ROAD WERE REPLACED WITH A LOW ROCK ROW USING RIP-RAP AND NO. 57 STONE TO DROP OUT SEDIMENT FROM RUNOFF PRIOR TO FLOWING INTO THE NATURAL FOREST (I.E., BUFFER AREA).

0 20 60 100 150 200ft
ORIGINAL SCALE 1"=100'-0"

FORT McCLELLAN, ANNISTON, AL
DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS

CLIENT DWG NO:

NOTES

DETAIL CALLOUT KEY

DETAIL NUMBER

DRAWING NUMBER WHERE DETAIL CAN BE FOUND

NOTE: TYPICAL (TYP) – IDENTIFIES A DETAIL CALLOUT FOR A PARTICULAR SYMBOL AS APPLICABLE FOR THAT SAME SYMBOL REPEATED ELSEWHERE ON THE DRAWING.

REFERENCE DRAWINGS

NO.	REVISION	DRAWN	CK'D	APPD	DATE
4	UPDATE FOR OPTION YR4 EVENT 1 REPORT	SAB	KJH	KJH	01/22/19
3	UPDATE FOR OPTION YR3 EVENT 1 REPORT	SAB	GDS	GDS	11/06/17
2	REVISED WITH ACTUAL EXCAVATION LIMITS. REVISED NOTES.	SAB	GDS	JT	01/13/17
1	RESTORATION REVISED BASED ON REVISED CONTAMINATION DELINEATION	CFB	GDS	GDS	03/15/16

APTIM

DRAWN: CFB | CK'D: GDS | APPD: GDS | DATE: 03/26/15 | SCALE: 1" = 100'

FORMER 81MM RANGE

FINAL RESTORATION

FOR: REMEDIAL ACTION WORK PLAN APPENDIX F

PROJECT NO: 500290 | DWG NO: F-8 | REV: 4

Form: CMS-830-00-FM-02104 CBI ANSI D.dwg

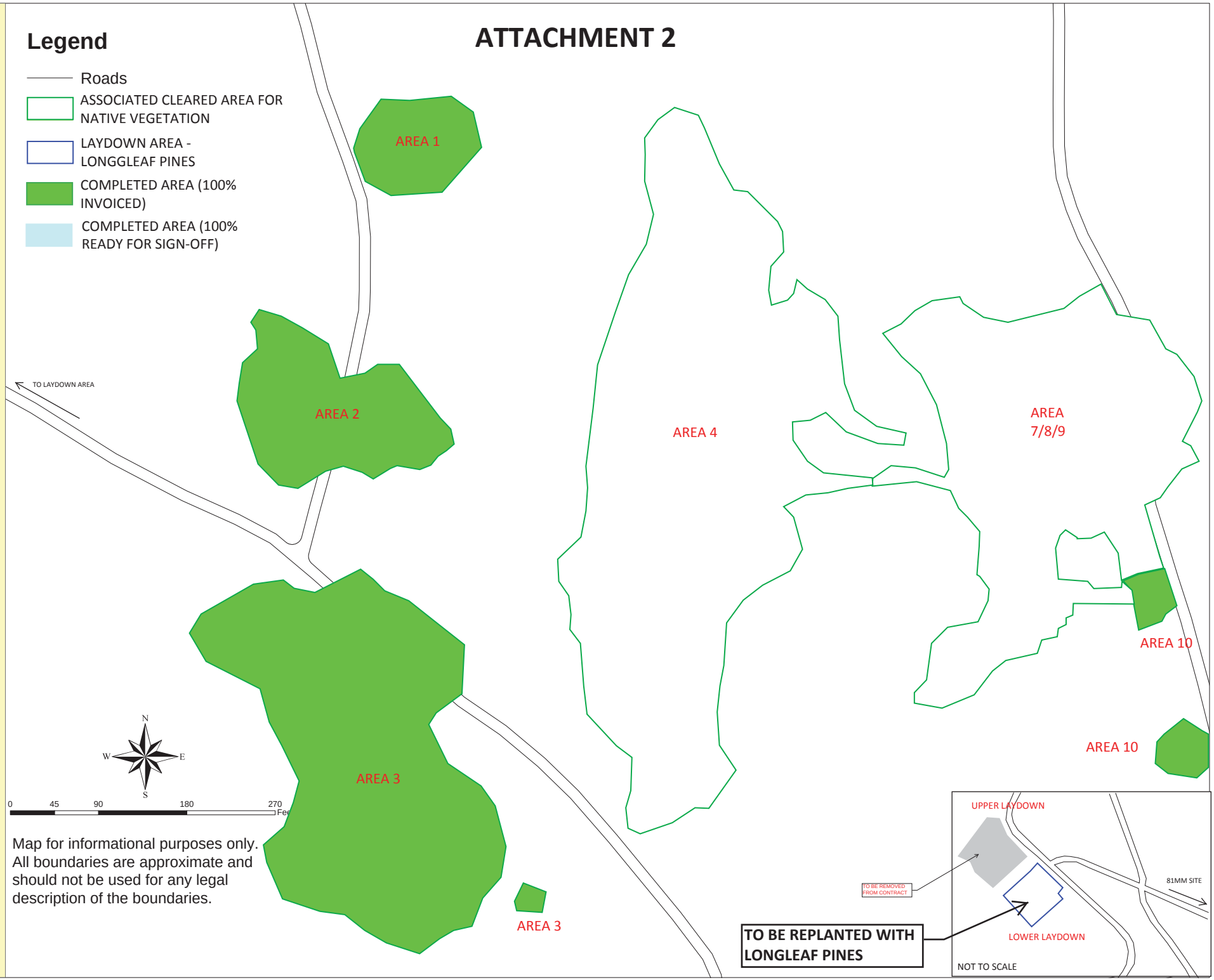
File: 500290-001-CH-08-F1_F8.dwg
Plot Date/Time: Jan 30, 2019 - 12:59pm
Plotted By: samantha.bentley

ATTACHMENT 2

Permanent Vegetation Establishment
Former 81mm Mortar Range

Legend

- Roads
- ASSOCIATED CLEARED AREA FOR NATIVE VEGETATION
- LAYDOWN AREA - LONGGLEAF PINES
- COMPLETED AREA (100% INVOICED)
- COMPLETED AREA (100% READY FOR SIGN-OFF)



Map for informational purposes only. All boundaries are approximate and should not be used for any legal description of the boundaries.

TO BE REPLANTED WITH LONGLEAF PINES

ATTACHMENT 3 - PERMANENT VEGETATION TRACKING (YEAR 4, EVENT 1)

FORMER 81MM MORTAR RANGE

Area	Acreage	% of Total Site Acreage	Permanent Vegetation Date(s)	% Coverage[a]	% Density[b]	Total % Complete	Coverage/Density Notes/Issues
1	0.26	3.10%	11/11/16	100%	100%	3.10%	*Complete; Invoiced*
2	0.58	6.90%	11/11/16	100%	100%	6.90%	*Complete; Invoiced*
3	1.80	21.43%	11/08/16	100%	90%	21.43%	*Complete; Invoiced*
4	2.98	35.48%	11/11/16	85%	85%	0.00%	Keith Westlake/James O'Quinn inspected on 08/08/18. Area has good stand of native vegetation, but is contaminated in spot areas with non-native Johnson Grass. Keith recommended an immediate spot treatment of Johnson Grass with a broad spectrum herbicide (glyphosate). James O'Quinn spot treated the Johnson Grass the week of 8/20, and followup inspection indicates it responded favorably.
7/8/9	1.87	22.26%	11/08/16	100%	80%	0.00%	Keith Westlake/James O'Quinn inspected on 08/08/18. Previous hand-seeding of extreme slope had positive results, but did not completely fill the central area with vegetation. No action recommended. Expect area to continue filling in after natural reseeding/burn cycle. Reinspect again at next event to determine if overseeding in Spring is merited.
10	0.14	1.67%	11/09/16	100%	100%	1.67%	*Complete; Invoiced*
UPPER LAYDOWN	0.98	11.67%	11/12/16	30%	90%	0.00%	No work performed. To be removed from contract.
LOWER LAYDOWN	0.77	9.17%	11/12/16	50%	90%	0.00%	Keith Westlake/James O'Quinn inspected on 08/08/18. Area continues to struggle. The area will be replanted with longleaf pines at next maintenance event.
TOTALS	**8.40**	**111.67%**				**33.10%**	

[a] *% Coverage* indicated for areas vegetated with native grass. Requirement is 100% coverage.

[b] *% Density* indicated for areas vegetated with native grass. Requirement is >=85% Density.

February 13, 2019

Melissa L. Shirley, P.E.
Contracting Officer Representative
U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, AL 36602

Re: Maintenance of Erosion Control Features and Vegetation Letter Report of Activities (FINAL), Year 4, Event 1, *Bains Gap Road Ranges*, Environmental Remediation Services at Four Sites, Fort McClellan, Anniston, AL
Contract: W912DY-10-D-0023, Task Order No. CK01
HGL Project Number: H10501

Dear Ms. Shirley:

HydroGeoLogic, Inc. (HGL) is pleased to submit this letter report documenting the activities associated with maintenance of erosion control features and vegetation at the Bains Gap Road Ranges (BGRR) at the former Fort McClellan (FTMC) in Anniston, Alabama. This report covers Year 4, Event 1, and documents erosion control and vegetation maintenance efforts undertaken since the previous maintenance event for the site under the above-referenced project. This documentation supports Project Milestone 419.01 as described in the PMP/QASP and project schedule and will serve as backup for invoicing purposes.

BACKGROUND AND OBJECTIVES

The former FTMC occupied 45,679 acres in the foothills of the Appalachian Mountains of northeastern Alabama, near the City of Anniston in Calhoun County. FTMC is approximately 74 miles (119 km) north-northeast of Birmingham, Alabama, and consists of three tracts of land: The Main Post, the Choccolocco Corridor, and Pelham Range. The former FTMC is not a National Priorities List site under the Comprehensive Environmental Response, Compensation, and Liability Act, 42 United States Code Annotated §9605.

BGRR is located directly south of Bain's Gap Road in the central-eastern section of the former FTMC Main Post area. The site is currently owned by U.S. Fish and Wildlife Service (USFWS) and located within the boundaries of Mountain Longleaf National Wildlife Refuge. BGRR consists of a series of former weapons firing ranges located adjacent to one another immediately south of Bain's Gap Road and were used primarily for small arms training. The site includes the following historical ranges/parcels:

- Range 24 Upper, Parcel 80Q;
- Range 21, Parcel 77Q;
- Range 22, Parcel 78Q and Former Mortar Range (Firing Line), Parcel 109Q; and
- Range 27, Parcel 85Q [CB&I Federal Services LLC (CB&I), 2013].

A Remedial Action (RA) consisting of site preparation; XRF screening and analysis for contaminant delineation; excavation of metals-contaminated soil and soil stabilization as necessary; post-excavation confirmation sampling and analysis; waste characterization sampling and analysis; transportation and disposal of waste soil; backfilling and re-grading; and site re-vegetation was undertaken from August 2015 through August 2017.

This event is one of six events for follow-up inspection and maintenance of erosion controls and vegetation ("maintenance phase"). The objective of the maintenance phase is to ensure that the areas of the site impacted by the RA construction are controlled to prevent erosion and sediment runoff from the site to the maximum extent practicable through inspection of vegetation and remaining engineered erosion control features, with corrective maintenance as necessary. The six events include:

- Year 3, Event 1 – completed July 2017
- Year 3, Event 2 – completed April 2018
- Year 4, Event 1 – completed from August 2018 to November 2018
- Year 4, Event 2 – on or about December 12, 2018
- Year 5, Event 1 – on or about March 16, 2019
- Year 5, Event 2 - on or about August 18, 2019

This letter report incorporates routine maintenance activities at BGRR occurring for Year 4, Event 1.

SUMMARY OF ACTIVITIES AND OPERATIONS PERFORMED

Erosion Controls:

Attachment 1 shows the configuration of erosion controls remaining at the site. Each of the remaining controls was inspected during Year 4, Event 1 on 12 September 2018 and found to be in good working order. The following activities were performed by APTIM during the maintenance cycle:

- Removed and disposed of residual silt fence in Area 3-1.
- Removed the mulch berm on the upslope side of Laydown Area A by spreading and flattening the mulch to allow uniform runoff to Laydown Area A and Area 6-5 rather than concentrating upgradient runoff with the mulch row.

The maintenance activities were primarily for improvements at the site, and all erosion control features were observed to be of an integrity suitable for performing their intended function going forward.

Vegetation:

Temporary Vegetation:

No longer applicable. The vegetation at the site was inspected during the event and all areas were observed to be predominantly permanent vegetation as described below.

Permanent Vegetation:

Inspections for permanent vegetation were conducted to identify any eroded areas which required repair and to identify areas where permanent vegetation did not cover 100% of the soil surface with a density of 85% or greater as defined by the Construction Best Management Practices Plan (CBMPP). A site plan showing the inspected areas and vegetation progress is included as Attachment 2.

Permanent vegetation was observed to be dominant at the site. Areas 3-1, 6-1, 6-6 and 6-8 were determined to meet the requirements for completeness, along with Areas 1, 2, 4, 6-3, 6-4 and 8/9, which were determined to be complete in previous inspections. As noted above, Areas 3-2, 6-5, 6-7, Laydown Area A, and Laydown Area B are predominantly covered with permanent vegetation and expected to fill in through natural reseeding over the next cycle. The flat portions of Area 6-2 to the west of the central berm should also continue to fill-in

naturally; however, the steep slope challenge area was observed to be only slowly filling in. The upper reaches of this area are targeted as an alternate location for longleaf pine planting for the next maintenance event (see below), and the remainder of the area will be overseeded with native vegetation in Spring 2019 during the planting cycle. In addition, Area 6-7 was noted to have a small seep (less than 1/8 acre) that will need some additional wetland plants and will be replanted with anticipated fire-adapted wetland species (such as pitcher plants) in the next planting cycle.

Longleaf Pines:

Approximately ten acres of the site in Areas 6-1, 6-2, 6-7, and 8/9 were permanently re-vegetated with longleaf pines on January 25, 2018. The areas were planted by hand at a density of 600 trees per acre across the 10 acres using a multi-person crew to accomplish the planting in the span of one morning. The trees were given an initial cursory inspection during the routine vegetation inspection in September 2018 with no major signs of distress in most areas. Area 8/9 PINES were observed to be shaded under adjacent and encroaching native partridge peas (over 6 feet tall).

A tree seedling survival survey was performed from 22 through 26 October 2018 to get a more accurate account of tree density and determine which areas may require remedial planting to achieve the minimum density of 350 trees per acre. The approach, location of survey plots, and survey results are included as Attachment 4. The results of the survey indicate that areas 6-1 PINES, 6-2 PINES and 6-7 PINES all have live seedling densities above the requirement and require no further planting.

Area 8/9 PINES, as noted previously, was confirmed visually through walking the area to have only a bare minimum of surviving pines (well less than the required density) due to the abundance of native vegetation crowding the area. After further discussions with the USFWS Refuge Manager, Area 8/9 PINES will be left with the current native vegetation cover, and additional longleaf pines will be planted in three alternate areas: 1) the upper reach of the steep slope challenge area (approximately 0.5 acres); 2) the location of the former mulch strip along the northern edge of Laydown Area A (approximately 0.25 acres), and 3) the lower laydown area at site 81MM (approximately 0.77 acres). The first two areas are shown in the figures in Attachment 2. The lower laydown area at site 81MM is shown in the 81MM Maintenance Letter Report.

Turbidity Monitoring:

HGL continued to inspect the site and monitor turbidity during the maintenance period in accordance with the CBMPP at the primary turbidity sampling point identified in Attachment 1. No turbidity issues were noted during the maintenance period. HGL will continue monitoring turbidity until the site is fully vegetated at the specified requirements.

FINDINGS SUMMARY

Year 4, Event 1 inspections of BGRR identified no active erosion, and all areas are completely covered with a mixture of active and dormant annual and permanent vegetation. Turbidity measurements for applicable rainfall events have shown no issues that exceed State of Alabama Construction General Permit requirements (delta of 50 NTUs between background and turbidity monitoring points).

As noted above, multiple areas at the site should continue to fill in with permanent vegetation naturally, while others will require additional seeding or planting to progress. A synopsis of

BGRR sub-areas, vegetation date, and percent vegetation completion is included as Attachment 3.

Major activities/findings are summarized below:

- Permanent vegetation uniformly covers 100% of the soil surface with a density of 85% or greater at Areas 1, 2, 3-1, 4, 6-1, 6-3, 6-4, 6-6, 6-8 and the vegetated portions of 8/9. These areas have been inspected and approved by U.S. Army Corps of Engineers as well, and no additional action is required.
- Areas 3-2, 6-5, 6-7, Laydown Area A and Laydown Area B should continue to fill in through the natural reseeding cycle. No additional action is required at this time.
- Area 6-2 continues to be protected with temporary and permanent vegetation, but the steep slope area will be replanted with longleaf pines in the upper slope area, with overseeding of native vegetation the remainder of the area in Spring 2019.
- Area 6-7 seep area will require planting of wetland vegetation in Spring 2019.
- Areas 6-1 PINES, 6-2 PINES, 6-7 PINES have greater than minimum density of longleaf pines and require no additional action.
- Area 8/9 PINES has only a trace of surviving longleaf pines and will be left in its current state of dominant native vegetation. Additional longleaf pines will be planted in three alternate areas as previously noted.

CONCLUSIONS

The erosion controls at the site continue to perform as intended and the site is protected from erosion with a cover of annual and/or permanent vegetation and/or trees in all areas. HGL will continue to monitor progress of vegetation growth at the site and will address any erosion issues or vegetation of remediated areas in accordance with the previously-noted maintenance schedule.

Please call or email me at (210) 477-2215, dreasons@hgl.com should you have any questions or comments concerning this document.

Sincerely,

David S. Reasons, PMP
Project Manager

Attachments:

1. Final Restoration Figure
2. Vegetation Inspection Areas Figure (Annotated)
3. BGRR Permanent Vegetation Tracking Table
4. BGRR Longleaf Pine Survey Plan and Results

cc: Jeffrey Tarr, APTIM
James O'Quinn, HydroGeoLogic, Inc.
Linda Bookout, USACE Mobile
Owen Nuttall, FTMC Army Transition Force
Lisa Holstein, FTMC Army Transition Force
Bill Shanks, FTMC Army Transition Force

ATTACHMENTS

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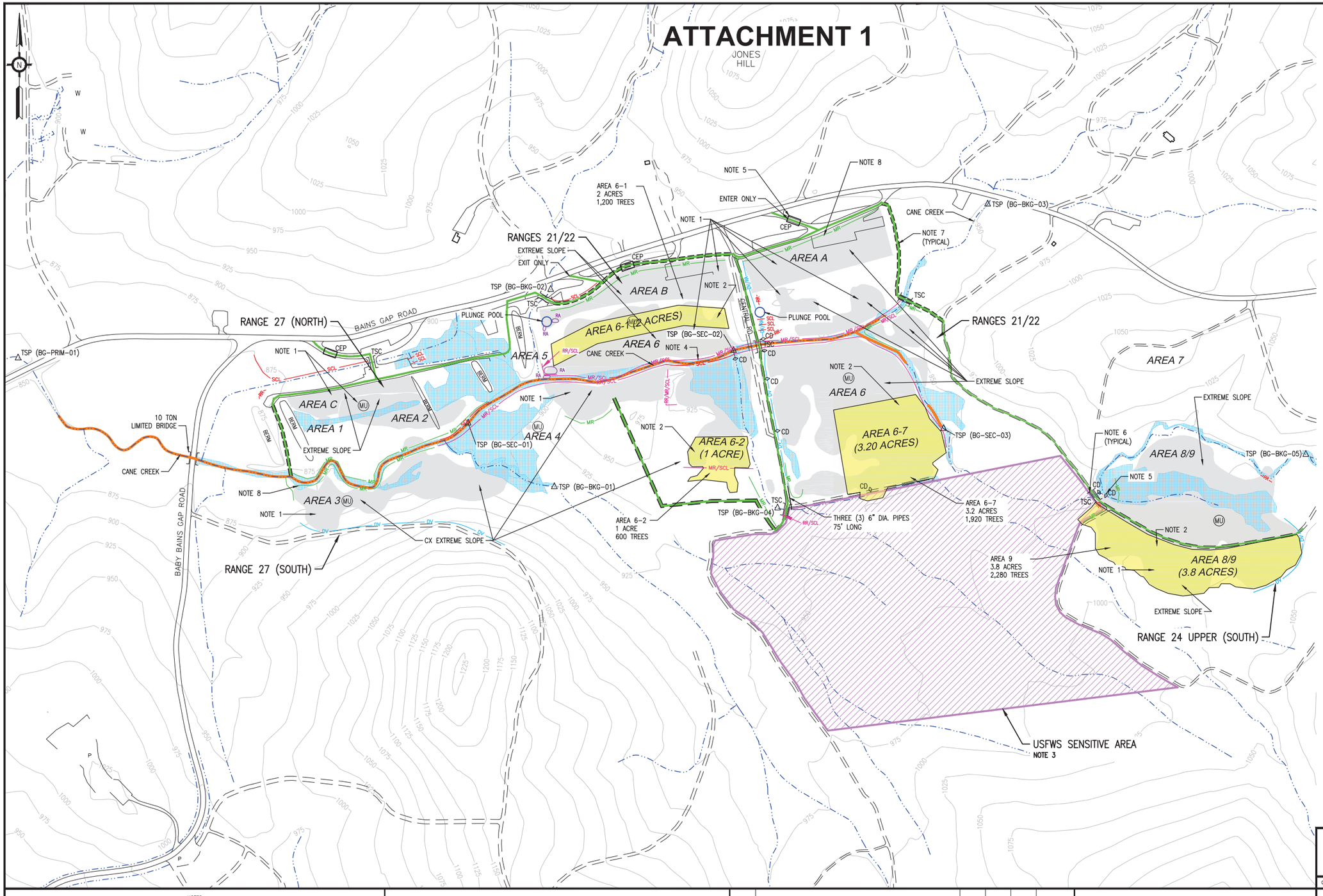
ATTACHMENT 1



LEGEND:

- EXISTING IMPROVED ROAD
- EXISTING UNIMPROVED ROAD (TO BE IMPROVED AS NEEDED)
- TEMPORARY ROAD
- HAUL ROAD
- EXCAVATION BOUNDARY
- HYDROMULCH WITH TENSAR HYDRA CX EXTREME SLOPE MATRIX
- WETLANDS
- 1150 TOPOGRAPHIC CONTOUR
- STREAM
- DV DIVERSION
- DV/RA DIVERSION WITH ROCK ARMORING
- RR/SCL SEDIMENT BARRIER (ROCK ROW/SEDIMENT CONTROL LOGS)
- MR/SCL SEDIMENT BARRIER (MULCH ROW/SEDIMENT CONTROL LOGS)
- SCL SEDIMENT BARRIER (SEDIMENT CONTROL LOGS)
- RR SEDIMENT BARRIER (ROCK ROW)
- RA ROCK ARMORING
- MR SEDIMENT BARRIER (MULCH ROW)
- MD SEDIMENT BARRIER (MULCH DAM)
- STREAM SEDIMENT REMOVAL
- ◊ ROCK CHECK DAM (CD)
- CONSTRUCTION EXIT PAD (CEP)
- TEMPORARY STREAM CROSSING (TSC)
- △ TURBIDITY SAMPLING POINT (TSP)
- (MU) MULCHING
- ○ PLUNGE POOL
- AREA FOR PLANTING MONTANE LONGLEAF PINE

NOTES:

1. HYDROMULCH WITH TENSAR HYDRA CX EXTREME SLOPE MATRIX OR EQUAL. ALL AREAS ARE PERMANENT SEED.
2. VEGETATE WITH MONTANE LONGLEAF PINE AT APPROXIMATELY ONE SEEDLING PER 8 FOOT BY 8 FOOT GRID, 600 SEEDLINGS PER ACRE. PLANT SEEDLINGS BETWEEN NOVEMBER 1 AND FEBRUARY 28.
3. USFWS SENSITIVE AREA NOT TO BE DISTURBED.
4. SEDIMENT BARRIERS TO REMAIN IN PLACE DURING RESTORATION. REMOVE AFTER ARMY APPROVAL OF FINAL STABILIZATION.
5. CHECK DAMS, DIVERSION AND OUTLET PROTECTION, AND CONSTRUCTION EXIT PADS TO REMAIN IN PLACE OR MODIFIED AND/OR REMOVED AS DIRECTED BY USFWS.
6. REMOVE TEMPORARY STREAM CROSSINGS AT AS DIRECTED BY USFWS AND ARMY.
7. TEMPORARY ROADS TO REMAIN IN PLACE.
8. THE FOLLOWING MAINTENANCE ACTIVITIES WERE PERFORMED IN NOVEMBER 2018:
   - REMOVED AND DISPOSED OF RESIDUAL SILT FENCE IN AREA 3-1.
   - REMOVED THE MULCH BERM ON THE UPSLOPE OF LAYDOWN AREA A BY SPREADING AND FLATTENING THE MULCH ROW TO ALLOW UNIFORM RUNOFF TO LAYDOWN AREA A SO THAT NATURAL RAINWATER COULD ENTER THE REVEGETATED AREA.

0 1 2 3 4 500ft

ORIGINAL SCALE 1"=200'-0"

FORT McCLELLAN, ANNISTON, AL
DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS

CLIENT DWG NO:

NOTES

REFERENCE DRAWINGS

NO.	REVISION	DRAWN	CK'D	APPD	DATE
3	UPDATE FOR OPTION YR4 EVENT 1 REPORT	SAB	KJH	KJH	01/18/2019
2	UPDATE FOR OPTION YR3 EVENT 1 REPORT	SAB	GDS	GDS	11/06/17
1	UPDATED	SAB	GS	JT	5/17/17

APTIM

DRAWN: CFB | CK'D: GDS | APPD: GDS | DATE: 03/26/15 | SCALE: 1" = 200'

BAINS GAP ROAD RANGES

FINAL RESTORATION

FOR: REMEDIAL ACTION WORK PLAN APPENDIX F

PROJECT NO: 500290 | DWG NO: F-2 | REV: 3

Form: CMS-830-00-FM-02104 CBI ANSI D.dwg

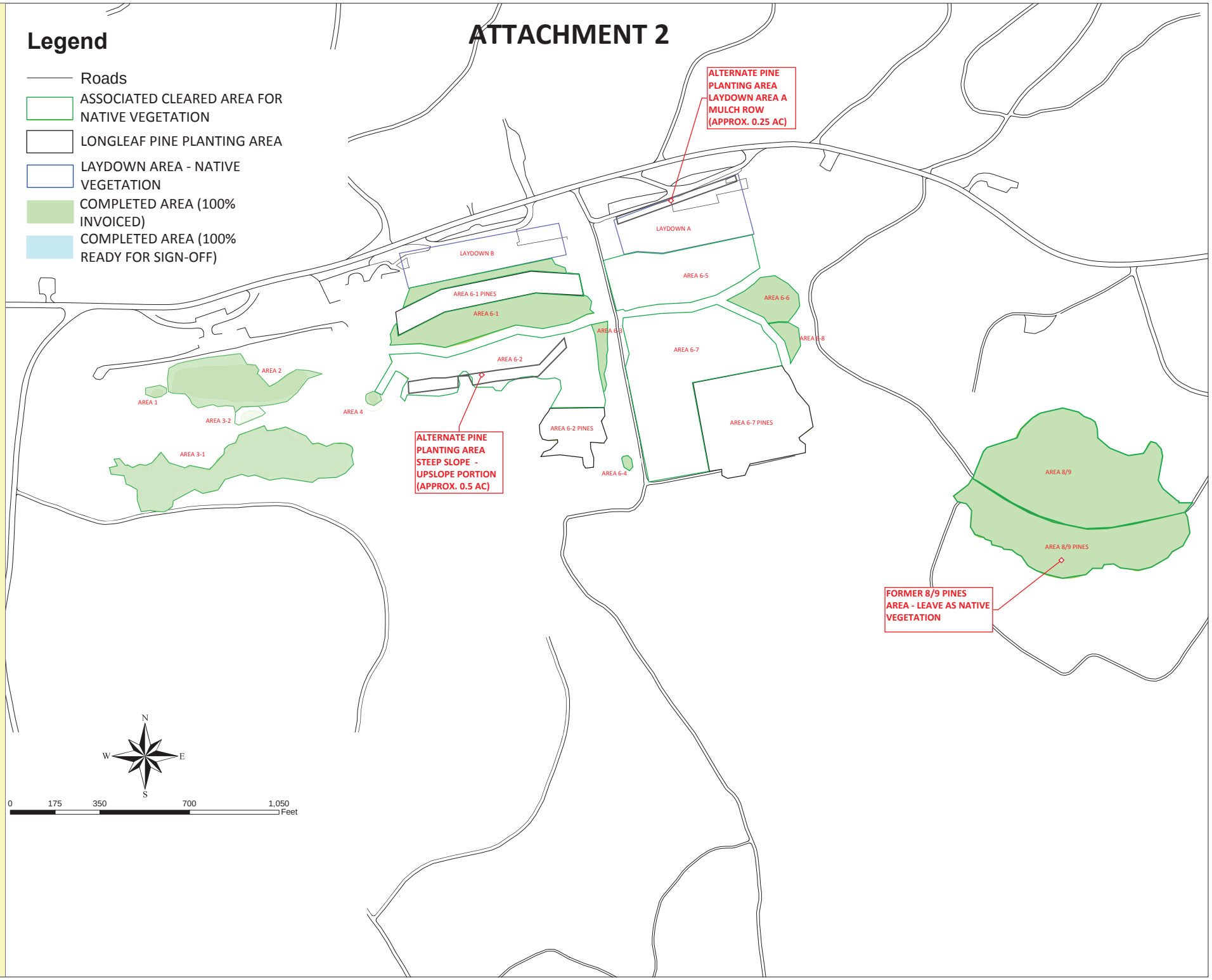
File: 500290-001-GV-08-F1_F8.dwg
Plot Date/Time: Jan 31, 2019 - 1:59pm
Plotted By: samantha.bentley

ATTACHMENT 2

Permanent Vegetation Establishment
Bains Gap Road Ranges

Legend

- Roads
- ASSOCIATED CLEARED AREA FOR NATIVE VEGETATION
- LONGLEAF PINE PLANTING AREA
- LAYDOWN AREA - NATIVE VEGETATION
- COMPLETED AREA (100% INVOICED)
- COMPLETED AREA (100% READY FOR SIGN-OFF)



ATTACHMENT 3 - PERMANENT VEGETATION TRACKING (YEAR 4, EVENT 1)

BAINS GAP ROAD RANGES

Area	Acreage	% of Total Site Acreage	Permanent Vegetation Date(s)	% Coverage or Survival[a]	% Density[b]	Total % Complete	Coverage/Density Notes/Issues
1	0.02	0.05%	12/10/16	100%	100%	0.05%	*Complete; Invoiced*
2	2.07	5.16%	12/11/16	100%	100%	5.16%	*Complete; Invoiced*
3-1	3.09	7.70%	12/11/16	100%	100%	7.70%	*Complete; Invoiced*
3-2	0.11	0.27%	12/11/16	85%	85%	0.00%	Inspected on 08/08/18. The area where stone was previously stockpiled is still to thin to consider complete. No action. Expect area to continue filling in after natural reseeding.
4	0.01	0.03%	12/11/16	100%	100%	0.03%	*Complete; Invoiced*
6-1	2.13	5.31%	11/09/16	100%	100%	5.31%	*Complete; Invoiced*
6-1 PINES	2.00	4.98%	01/25/18	80%	N/A	4.98%	Seedling survey completed 10/26/18. % survival > target.
6-2	3.65	9.10%	12/19/16	70%	70%	0.00%	Inspected on 08/08/18. Challenge area slope not completely vegetated. Planted/encroaching native vegetation slowly filling in. Recommend overseeding in Spring 2019 similar to Spring 2018. Flat areas to the west of central berm that were tilled and planted are responding well and should continue to fill in naturally.
6-2 PINES	1.00	2.49%	01/25/18	67%	N/A	2.49%	Seedling survey completed 10/26/18. % survival > target.
6-3	0.28	0.70%	11/19/16	100%	100%	0.70%	*Complete; Invoiced*
6-4	0.06	0.15%	12/11/16	100%	100%	0.15%	*Complete; Invoiced*
6-5	2.52	6.28%	12/11/16	100%	80%	0.00%	Inspected on 08/08/18. Eastern end of area has not completely filled in from a density standpoint. Western end of area is complete. No action recommended. Expect area to continue filling in after natural reseeding/burn.
6-6	0.80	1.99%	12/11/16	100%	100%	1.99%	*Complete; Invoiced*
6-7	5.46	13.61%	12/11/16	97%	97%	0.00%	Inspected on 08/08/18. With the exception of the spring/seep adjacent to the longleaf planting area, the area is very close to 100%. The spring/seep is small (less than 1/8th acre) but will need some wetland plants to achieve completion.
6-7 PINES	3.20	7.97%	01/25/18	67%	N/A	7.97%	Seedling survey completed 10/26/18. % survival > target.
6-8	0.23	0.57%	12/11/16	100%	100%	0.57%	*Complete; Invoiced*
8/9	5.32	13.26%	04/11/17	100%	85%	13.26%	*Complete; Invoiced*
8/9 PINES	3.80	9.47%	01/25/18	0%	N/A	0.00%	Seedling survey completed 10/26/18. Pine trees are shaded under partridge peas 6+ feet tall. Alternate locations for pines: upper reach of steep slope challenge area, former mulch row strip north of Laydown A, and Lower Laydown at 81MM.
LAYDOWN A	2.40	5.98%	12/11/16	90%	85%	0.00%	Inspected on 08/08/18. No action recommended. Expect area to continue filling in after natural reseeding/burn cycle.
LAYDOWN B	1.98	4.93%	04/14/17	90%	85%	0.00%	Inspected on 08/08/18. No action recommended. Expect area to continue filling in after natural reseeding/burn cycle.
TOTALS	**40.13**	**100.00%**				**50.36%**	

[a] *% Coverage* indicated for areas vegetated with native grass. Requirement is 100% coverage.
% Survival indicated for areas with PINES planted. Required to be >=350/600 trees/acre or 58.33%

[b] *% Density* indicated for areas vegetated with native grass. Requirement is >=85% Density. Not applicable for PINE areas.

ATTACHMENT 4 – LONGLEAF PINE SURVIVAL SURVEY PROCEDURE AND RESULTS

The procedure to evaluate Longleaf Pine Seedling survival at the former Ft. McClellan was established through evaluation of the literature and subsequent conversations with Keith Westlake (USFWS) and Paul Williams (Alabama Forestry Commission) to establish their typical and preferred methodologies for evaluating timber growth. The following documents from the literature were consulted:

- Southern Regional Extension Forestry "Measuring Survival and Planting Quality in New Pine Plantations"
- Natural Resources Conservation Service Texas Forestry Technical Note, TX-FS-12-4 (How to Quickly Check Behind a Plating Operation section)
- Woodland Technical Note OK-12 "Determining Tree Survivability Following Tree Planting

These documents have a generally consistent process for measuring pine survivability that is also what USFWS and AFC recommend based on conversations with them. Keith Westlake, manager of the Mountain Longleaf NWR, requested a 5% survey density of the pines planted at the Bain's Gap Road Ranges within the Refuge. HGL decided to continue the 5% sample density when surveying the plantings at the Choccolocco Corridor Ranges on Alabama State Forest land. The Alabama Forestry Commission requested a 2% sample density of the areas planted at CCR. HGL will adhere to the survival numbers described in the RAWP (350 per acre).

The survey procedure is as follows:

Step 1 – Randomly select the location of the correct number of survey plots for each sample area using the center of established sample grids as the sample location. For example, the BGRR Area 6-1 Pines section covers two acres, and would require 10 sample plots (at 1/100th of an acre each – see below) to yield a 5% per acre survey.

Step 2 – Locate selected survey plots using GPS.

Step 3 – Mark center of sample location with labeled wood stake so that stakeholders can replicate/QC work if they so desire.

Step 4 – Place a pin or nail in the stake, pull a steel tape 11.775 feet from the pin and establish a circle approximately 1/100th of an acre in area.

Step 5 – Count all live seedlings inside the circle and record results.

Step 6 – Average the survey data for each area by tallying the number of surviving seedlings identified in each plot and dividing the tally by the number of survey plots utilized to survey the area.

Step 7 – Multiply the result of the calculation in Step 6 by 100 to determine the estimated seedling survival for the given Area.

If the result of Step 7 is less than 350. Subtract the result of Step 7 from 600 and divide the result by 2. The quotient of this calculation yields the number of seedlings that will need to be replanted to meet the requirements outlined in the RAWP.

Note: The 1/100th acre plot size will be maintained in all sample areas. The 1/100th acre sample will exceed 5% of the total acreage of Area 2 and Area 7 at CCR but will still be used for consistency in approach.

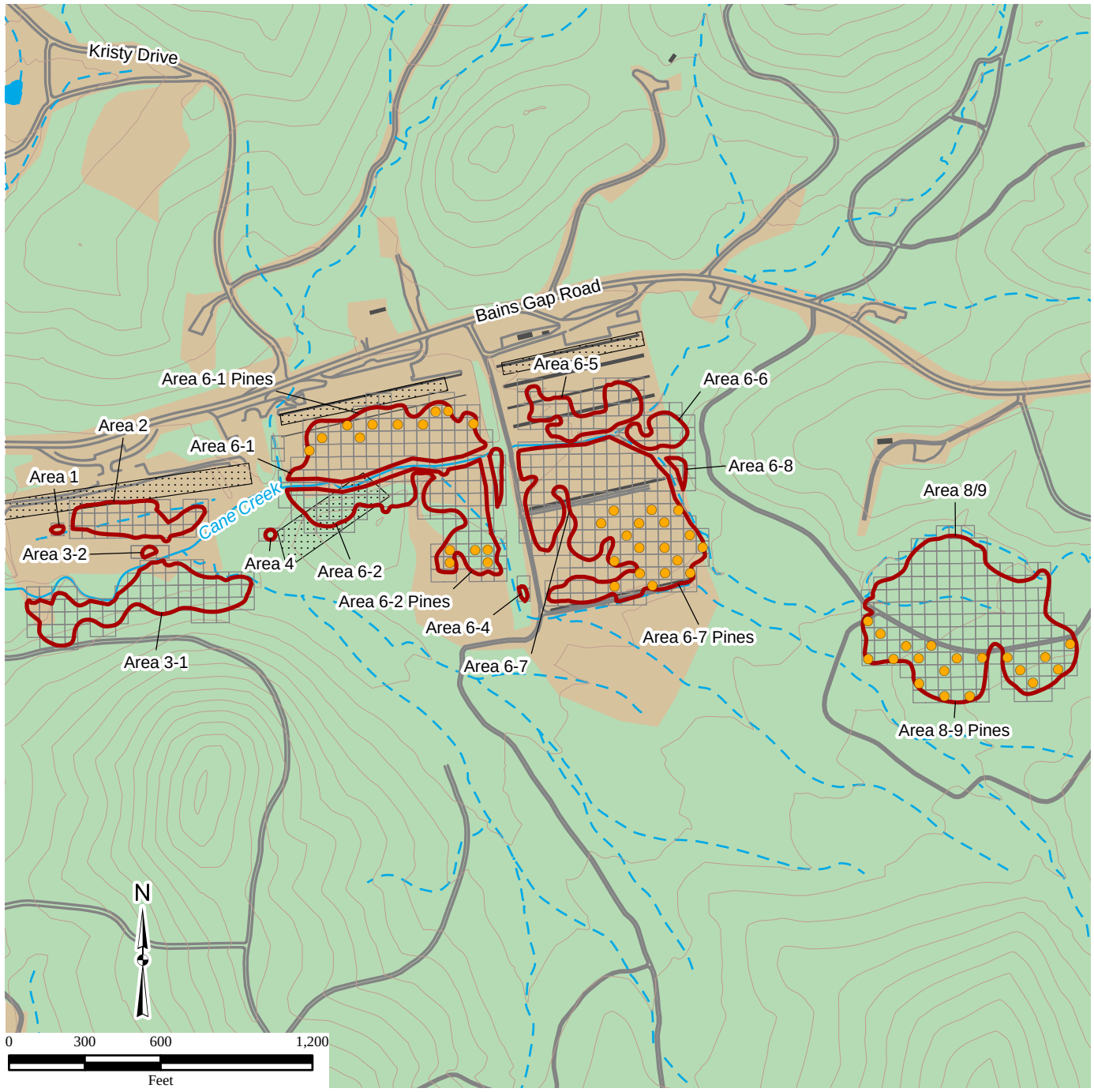


Figure 1
Longleaf Pine Seedling Sample Plot Map

Legend

- Sample Location
- Grid Cell
- Exceedance Contour (Original Delineation)
- Surface Drainage Feature (dashed where intermittent)
- Topographic Contour (25 foot interval)
- Road
- Firing Line
- Concrete Slab
- Wooded
- Not Wooded

\\gst-srv-01\HGLGIS\Ft_McClellan_MSIW\Longleaf_Pine_Seedling\(1)Longleaf Pine Seedling Samp Bains Gap.mxd
10/18/2018 TB
Source: HGL, Shaw

HydroGeoLogic, Inc

HGL—Longleaf Pine Seedling Sample Plot Map—Fort McClellan, Anniston, Alabama

Longleaf Pine Seedling Survey Results
Bains Gap Road Ranges

Area	Acreage	Plot Number	Grid Cell	Sample Plot Coordinates *		Surveyed Seedling Count
				UTM_X	UTM_Y	
6-1 PINES	2	1	116	615317.5445	3731251.544	4
		2	117	615332.7805	3731251.716	4
		3	123	615211.0643	3731235.102	5
		4	125	615241.5365	3731235.447	6
		5	127	615272.0086	3731235.791	7
		6	129	615302.4807	3731236.135	4
		7	133	615363.4249	3731236.824	3
		8	135	615180.7644	3731219.522	4
		9	138	615226.4726	3731220.038	7
		10	149	615165.7006	3731204.113	4
					Total Live Seedlings by Actual Count	48
					Estimated Live Seedlings per Acre	480
					Estimated Live Seedlings in Area	960
					Seedlings Planted in Area on 01/25/18	1200
					Estimated Seedling Survival Rate	**80%**
6-2 PINES	1	1	261	615334.6751	3731084.119	4
		2	263	615365.1472	3731084.464	4
		3	264	615380.3832	3731084.636	6
		4	267	615334.8473	3731068.883	3
		5	270	615380.5555	3731069.4	3
					Total Live Seedlings by Actual Count	20
					Estimated Live Seedlings per Acre	400
					Estimated Live Seedlings in Area	400
					Seedlings Planted in Area on 01/25/18	600
					Estimated Seedling Survival Rate	**67%**
6-7 PINES	3.2	1	409	615532.2272	3731132.066	4
		2	412	615577.9354	3731132.583	0
		3	414	615610.3738	3731132.351	4
		4	421	615517.1634	3731116.658	3
		5	424	615562.8716	3731117.175	4
		6	426	615593.3437	3731117.519	1
		7	437	615547.8078	3731101.767	4
		8	442	615623.9881	3731102.628	4
		9	452	615563.216	3731086.703	5
		10	454	615593.6882	3731087.047	5
		11	457	615639.3964	3731087.564	6
		12	461	615532.9161	3731071.122	5
		13	466	615609.0965	3731071.983	4
		14	475	615563.5605	3731056.231	5
		15	477	615594.0326	3731056.575	5
		16	479	615624.5048	3731056.919	3
		17	485	615533.2606	3731040.65	6
		18	488	615578.9688	3731041.167	4
					Total Live Seedlings by Actual Count	72
					Estimated Live Seedlings per Acre	400
					Estimated Live Seedlings in Area	1280
					Seedlings Planted in Area on 01/25/18	1920
					Estimated Seedling Survival Rate	**67%**

Area	Acreage	Plot Number	Grid Cell	Sample Plot Coordinates *		Surveyed Seedling Count
				UTM_X	UTM_Y	
8/9 PINES	3.8		572	615838.4987	3730998.386	
			589	615853.907	3730983.322	
			608	615884.5513	3730968.431	
			610	615915.0236	3730968.775	
			621	616082.6205	3730970.67	
			622	615839.0154	3730952.678	
			624	615869.4875	3730953.022	
			626	615899.9597	3730953.367	
			629	615945.668	3730953.883	
			631	615976.1401	3730954.228	
			633	616006.6123	3730954.572	
			636	616052.3206	3730955.089	
			642	615930.6041	3730938.475	
			647	616022.0206	3730939.508	
			650	616067.7289	3730940.025	
			652	615900.3041	3730922.895	
			660	616037.4289	3730924.445	
			665	615930.9485	3730908.003	
			667	615961.4207	3730908.347	
		Survey process could not be used accurately due to density of native vegetation. Walking transects indicate that only a single, broken, line of trees along the southern boundary of the area survived.				
					Estimated Seedling Survival Rate	**0%**

* Coordinate System: NAD 1983 UTM Zone 16N

February 13, 2019

Melissa L. Shirley, P.E.
Contracting Officer Representative
U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, AL 36602

Re: Maintenance of Erosion Control Features and Vegetation Letter Report of Activities (FINAL), Year 4, Event 1, *Former Choccolocco Corridor Ranges*, Environmental Remediation Services at Four Sites, Fort McClellan, Anniston, AL
Contract: W912DY-10-D-0023, Task Order No. CK01
HGL Project Number: H10501

Dear Ms. Shirley:

HydroGeoLogic, Inc. (HGL) is pleased to submit this letter report documenting the activities associated with maintenance of erosion control features and vegetation at the Former Choccolocco Corridor Ranges (CCR) at the former Fort McClellan (FTMC) in Anniston, Alabama. This report covers Year 4, Event 1, and documents erosion control and vegetation maintenance efforts undertaken since the previous maintenance event for the site under the above-referenced project. This documentation supports Project Milestone 421.01 as described in the PMP/QASP and project schedule and will serve as backup for invoicing purposes.

BACKGROUND AND OBJECTIVES

The former FTMC occupied 45,679 acres in the foothills of the Appalachian Mountains of northeastern Alabama, near the City of Anniston in Calhoun County. FTMC is approximately 74 miles (119 km) north-northeast of Birmingham, Alabama, and consists of three tracts of land: The Main Post, the Choccolocco Corridor, and Pelham Range. The former FTMC is not a National Priorities List site under the Comprehensive Environmental Response, Compensation, and Liability Act, 42 United States Code Annotated §9605.

CCR is located east of the Choccolocco Mountains in Choccolocco Corridor, near the eastern boundary of the FTMC Main Post. The site is owned by the State of Alabama, is managed by the Alabama Forestry Commission (AFC), and is part of the Choccolocco Wildlife Management Area. The CCR ranges were weapons firing ranges (primarily small arms) and impact areas that were used during the 1960s and 1970s, although there are accounts that some of the ranges were used as far back as the 1940s and 1950s. Bullet fragments, shell casings, and other evidence of small arms training (e.g., targets, firing positions or target pits, berms) are present at most of the sites. The former CCR consists of ten parcels grouped in four adjacent areas:

- Former Range 40, Parcel 94Q, and Range, Choccolocco Corridor, Parcel 146Q;
- Former Range 41, Parcel 95Q, and Impact Area, Parcel 131Q-X;
- Former Range 42, Parcel 96Q; Range, Choccolocco Corridor, Parcel 145Q-X; and Impact Area, Choccolocco Corridor, Parcel 148Q-X; and
- Former Range 43, Parcel 97Q; Range, Choccolocco Corridor, Parcel 144Q-X; and Impact Area, Choccolocco Corridor, Parcel 147Q-X.

A Remedial Action (RA) consisting of site preparation; XRF screening and analysis for contaminant delineation; excavation of metals-contaminated soil and soil stabilization as necessary; post-excavation confirmation sampling and analysis; waste characterization sampling and analysis; transportation and disposal of waste soil; backfilling and re-grading; and site re-vegetation was undertaken from May 2015 through September 2017.

This event is one of six events for follow-up inspection and maintenance of erosion controls and vegetation ("maintenance phase"). The objective of the maintenance phase is to ensure that the areas of the site impacted by the RA construction are controlled to prevent erosion and sediment runoff from the site to the maximum extent practicable through inspection of vegetation and remaining engineered erosion control features, with corrective maintenance as necessary. The six events include:

- Year 3, Event 1 – completed July 2017
- Year 3, Event 2 – completed April 2018
- Year 4, Event 1 – completed from September 2018 to November 2018
- Year 4, Event 2 – on or about December 12, 2018
- Year 5, Event 1 – on or about March 16, 2019
- Year 5, Event 2 - on or about August 18, 2019

This letter report incorporates routine maintenance activities at CCR occurring for Year 4, Event 1.

SUMMARY OF ACTIVITIES AND OPERATIONS PERFORMED

Erosion Controls:

Attachment 1 shows the configuration of erosion controls remaining at the site. Each of the remaining controls was inspected during Year 4, Event 1 on 12 September 2018 and found to be in good working order, except for the following maintenance activities performed by APTIM during the maintenance cycle in November 2018 (photographs in Attachment 5):

- Repaired typical road erosion along the Upper Road adjacent to Areas 1/3 and 4/5 by reworking and track compacting the roads to provide a smooth surface and knocking down the berms along the east side of the Upper Road to allow down slope drainage off the roadway. The repairs extend approximately 1,200 feet along the Upper Road from Area 7 past the forebay/plunge pool adjacent to Area 1/3. Revitalization included the use of stone and riprap.
- Repaired two areas of surface erosion along two abandoned temporary roads cut into Area 1/3 by rock armoring the existing gully, providing rock rows perpendicular to the flow at approximately 25-foot intervals, constructing a small rock wall at the bottom of the gully to trap sediment, and knocking down the existing berms to allow water kickout.
- Repaired an approximate 450-foot section of Central Road starting from Area 18 and extending eastward by compacting the road and revitalizing the road with riprap and stone.

HGL and APTIM met with AFC on November 29 to inspect the maintenance results, and AFC was pleased with and approved the improvements.

Vegetation:

Temporary Vegetation:

No longer applicable. The vegetation at the site was inspected during the event and all areas were observed to be completely or sufficiently covered with permanent vegetation or longleaf pines as described below.

Permanent Vegetation:

Inspections for permanent vegetation were conducted to identify any eroded areas which required repair and to identify areas where permanent vegetation did not cover 100% of the soil surface with a density of 85% or greater as defined by the Construction Best Management Practices Plan (CBMPP). A site plan showing the inspected areas and vegetation progress is included as Attachment 2.

The only area at CCR requiring permanent vegetation other than longleaf pines is the South Laydown area. This area was planted previously with an AFC-specified blend of permanent vegetation and was observed to meet the requirements for completeness. This area has not yet been approved, but no further action is required.

Longleaf Pines:

Approximately 25 acres of the site in Areas 1/3, 2, 4/5, 7, 8/9/10, 12, 13, 14, 16/Central Laydown, 18, 19, 20, 21, 22, 23, 24, 25, and 26 were permanently re-vegetated with longleaf pines in January 2018. The areas were planted by hand at a density of 600 trees per acre across the 25 acres using a multi-person crew to accomplish the planting in the span of one afternoon. The trees were given an initial cursory inspection during the routine vegetation inspection in September 2018 with no major signs of distress in most areas. Areas 16 and 18 appeared to have competition present with native vegetation, primarily partridge pea.

A longleaf pine seedling survival survey was performed from 22 through 26 October 2018 to obtain a more accurate account of tree density and determine which areas may require remedial planting to achieve the minimum density of 350 trees per acre. The approach, location of survey plots, and survey results are included as Attachment 4. The results of the survey indicate that areas 1/3, 2, 4/5, 6, 8/9/10, 12, 13, 14, 19, 20, 21, 22, 23, 24, 25 and 26 all have seedling densities above the target requirement and require no further planting. Areas 16/Central Laydown and 18 were confirmed to have less than the minimum required density due to an abundance of native vegetation crowding these areas. After consultation with Alabama Forestry Commission, these two areas will be mowed to cut down native vegetation followed by remedial planting of longleaf pines to achieve the minimum density during the next maintenance event.

Turbidity Monitoring:

HGL continued to inspect the site and monitor turbidity during the maintenance period in accordance with the CBMPP at each of the primary turbidity sampling points identified in Attachment 1. No turbidity issues were noted during the maintenance period.

FINDINGS SUMMARY

Year 4, Event 1 inspections of CCR identified some erosion in limited areas as noted above, but none impacting runoff from the site. All areas are completely covered with a mixture of active and dormant annual and permanent vegetation and trees in applicable areas. Turbidity measurements for applicable rainfall events have shown no issues that exceed State of Alabama

Construction General Permit requirements (delta of 50 NTUs between background and turbidity monitoring points).

As noted above, multiple areas at the site are complete, while others will require additional planting to progress. A synopsis of CCR sub-areas, vegetation date, and percent vegetation completion is included as Attachment 3.

Major activities/findings are summarized below:

- Permanent vegetation uniformly covers 100% of the soil surface with a density of 85% or greater in the South Laydown area. Approval of this area by the U.S. Army Corps of Engineers will be requested.
- Areas 1/3, 2, 4/5, 6, 8/9/10, 12, 13, 14, 19, 20, 21, 22, 23, 24, 25 and 26 all have longleaf pine densities above the minimum requirement and are expected to maintain that survival rate. No further action is required. Approval of these areas by the U.S. Army Corps of Engineers will be requested.
- Areas 16/Central Laydown and 18 have live longleaf pine densities below the minimum requirement due to encroaching native vegetation. HGL will prepare the areas by mowing to control native vegetation and replant longleaf pines during the next maintenance event.

CONCLUSIONS

The erosion controls at the site continue to perform as intended and the site is protected from erosion with a cover of annual and/or permanent vegetation and trees in all areas. HGL will continue to monitor progress of vegetation growth at the site and will address any erosion issues or vegetation of remediated areas in accordance with the previously-noted maintenance schedule.

Please call or email me at (210) 477-2215, dreasons@hgl.com should you have any questions or comments concerning this document.

Sincerely,

David S. Reasons, PMP
Project Manager

Attachments:

1. Final Restoration Figure
2. Vegetation Inspection Areas Figure (Annotated)
3. CCR Permanent Vegetation Tracking Table
4. CCR Longleaf Pine Survey Procedure and Results
5. Photographs

cc: Jeffrey Tarr, APTIM
James O'Quinn, HydroGeoLogic, Inc.
Linda Bookout, USACE Mobile

Owen Nuttall, FTMC Army Transition Force
Lisa Holstein, FTMC Army Transition Force
Bill Shanks, FTMC Army Transition Force

ATTACHMENTS

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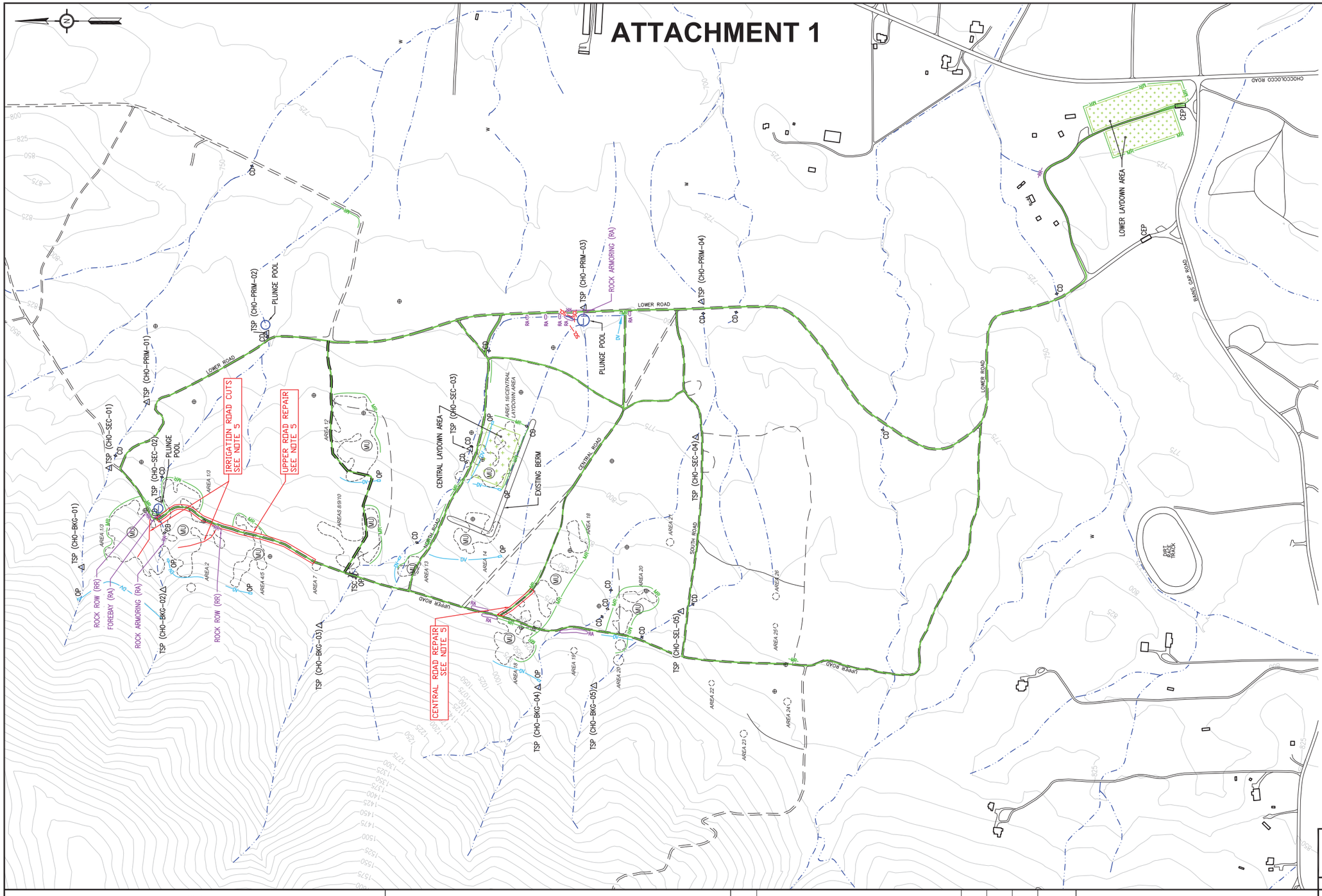
ATTACHMENT 1



LEGEND:

- EXISTING IMPROVED ROAD
- EXISTING UNIMPROVED ROAD
- HAUL ROAD
- EXCAVATION BOUNDARY
- HYDROMULCH WITH TENSAR HYDRA CX EXTREME SLOPE MATRIX OR EQUAL.
- 1150 TOPOGRAPHIC CONTOUR
- STREAM
- DV DIVERSION
- MR MULCH ROW
- RA ROCK ARMORING (RA)
- SCL SOIL CONTAINMENT LOG (SCL)
- RR ROCK ROW
- PROPOSED SOIL STABILIZATION AND LAYDOWN AREA
- ROCK CHECK DAM (CD)
- CONSTRUCTION EXIT PAD (CEP)
- TEMPORARY STREAM CROSSING (TSC)
- MONITORING WELL
- MU MULCHING
- PLUNGE POOL
- OUTLET PROTECTION (OP)
- TURBIDITY SAMPLING POINT (TSP)

NOTES:

1. TEMPORARY SEED BY HYDROSEEDING PRIOR TO HYDROMULCHING. TEMPORARY SEED FROM SEPTEMBER 1 TO NOVEMBER 1. PERMANENT VEGETATE WITH MONTANE LONGLEAF PINE AT APPROXIMATELY ONE SEEDLING PER 8-FOOT BY 8-FOOT GRID, 600 SEEDLINGS PER ACRE. PLANT SEEDLINGS BETWEEN NOVEMBER 1 AND APRIL 1. DISTURBED AREAS TO BE PLANTED WITH MONTANE LONGLEAF PINE EXCEPT LOWER LAYDOWN AREA.
2. HYDROMULCH WITH TENSAR™ HYDRA CX EXTREME SLOPE MATRIX OR EQUAL.
3. SEDIMENT BARRIERS TO REMAIN IN PLACE EXCEPT SILT FENCE.
4. CHECK DAMS, DIVERSION, OUTLET PROTECTION, ROCK ARMORING, PLUNGE POOLS, TEMPORARY STREAM CROSSINGS, OUTLET PROTECTION, AND CONSTRUCTION EXIT PADS TO REMAIN IN PLACE.
5. THE FOLLOWING MAINTENANCE ACTIVITIES WERE PERFORMED IN NOVEMBER 2018:
   - REPAIRED TYPICAL ROAD EROSION ALONG UPPER ROAD ADJACENT TO AREAS 1/3 THROUGH 4/5 BY REWORKING AND TRACK COMPACTING THE ROADS TO PROVIDE A SMOOTH SURFACE AND KNOCKING DOWN THE BERMS ALONG THE EAST SIDE OF THE UPPER ROAD TO ALLOW DOWNSLOPE DRAINAGE OFF THE ROADWAY. THESE REPAIRS EXTEND APPROXIMATE 1,200 FEET ALONG UPPER ROAD FROM AREA 7 PAST THE FOREBAY/PLUNGE POOL ADJACENT TO AREA 1/3. REVITALIZATION INCLUDED THE USE OF #57 STONE AND IN SOME CASES RIP RAP.
   - REPAIRED TWO AREAS OF SURFACE EROSION ALONG TWO ABANDONED TEMPORARY ROAD CUTS INTO AREA 1/3 BY ROCK ARMORING THE EXISTING GULLY, PROVIDING ROCK ROWS PERPENDICULAR TO THE FLOW AT APPROXIMATELY 25 FOOT INTERVALS, AND CONSTRUCTING A SMALL ROCK ROW AT THE BOTTOM OF THE GULLY TO TRAP SEDIMENT.
   - REPAIRED AN APPROXIMATE 450 FOOT SECTION OF CENTRAL ROAD STARTING FROM AREA 18 AND EXTENDING EASTWARD BY COMPACTING THE ROAD AND REVITALIZING THE ROAD WITH RIP RAP AND #57 STONE.

0 200 400 600 800 1000ft

ORIGINAL SCALE 1"=300'-0"

FORT McCLELLAN, ANNISTON, AL
DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS

CLIENT DWG NO:

NOTES

DETAIL CALLOUT KEY

DETAIL NUMBER

DRAWING NUMBER WHERE DETAIL CAN BE FOUND

NOTE: TYPICAL (TYP) – IDENTIFIES A DETAIL CALLOUT FOR A PARTICULAR SYMBOL AS APPLICABLE FOR THAT SAME SYMBOL REPEATED ELSEWHERE ON THE DRAWING.

REFERENCE DRAWINGS

NO.	REVISION	DRAWN	CK'D	APPD	DATE
2	UPDATE FOR OPTION YR4 EVENT 1 REPORT	SAB	KJH	KJH	01/18/2019
1	FINAL	SAB	GDS	GDS	09/06/17

APTIM

DRAWN: CFB | CK'D: GDS | APPD: GDS | DATE: 03/26/15 | SCALE: SAB

FORMER CHOCCOLOCCO CORRIDOR RANGES
FINAL EROSION AND SEDIMENT CONTROLS

FOR: REMEDIAL ACTION WORK PLAN APPENDIX F

PROJECT NO: 500290 | DWG NO: F-6 | REV: 2

File: 500290-001-01-08-F1_F8.dwg
Plot Date/Time: Jan 30, 2019 - 12:56pm
Plotted By: samantha.bentley

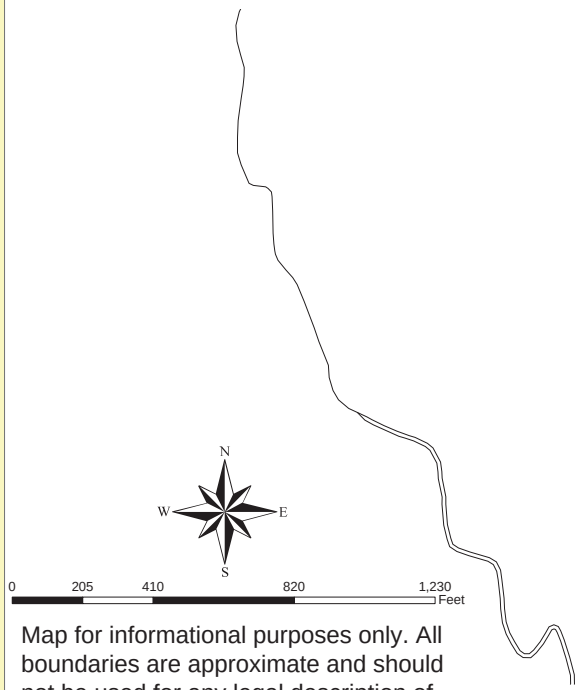
Form: CMS-830-00-FM-02104 CBI ANSI D.dwg

Permanent Vegetation Establishment
Former Choccolocco Corridor Ranges

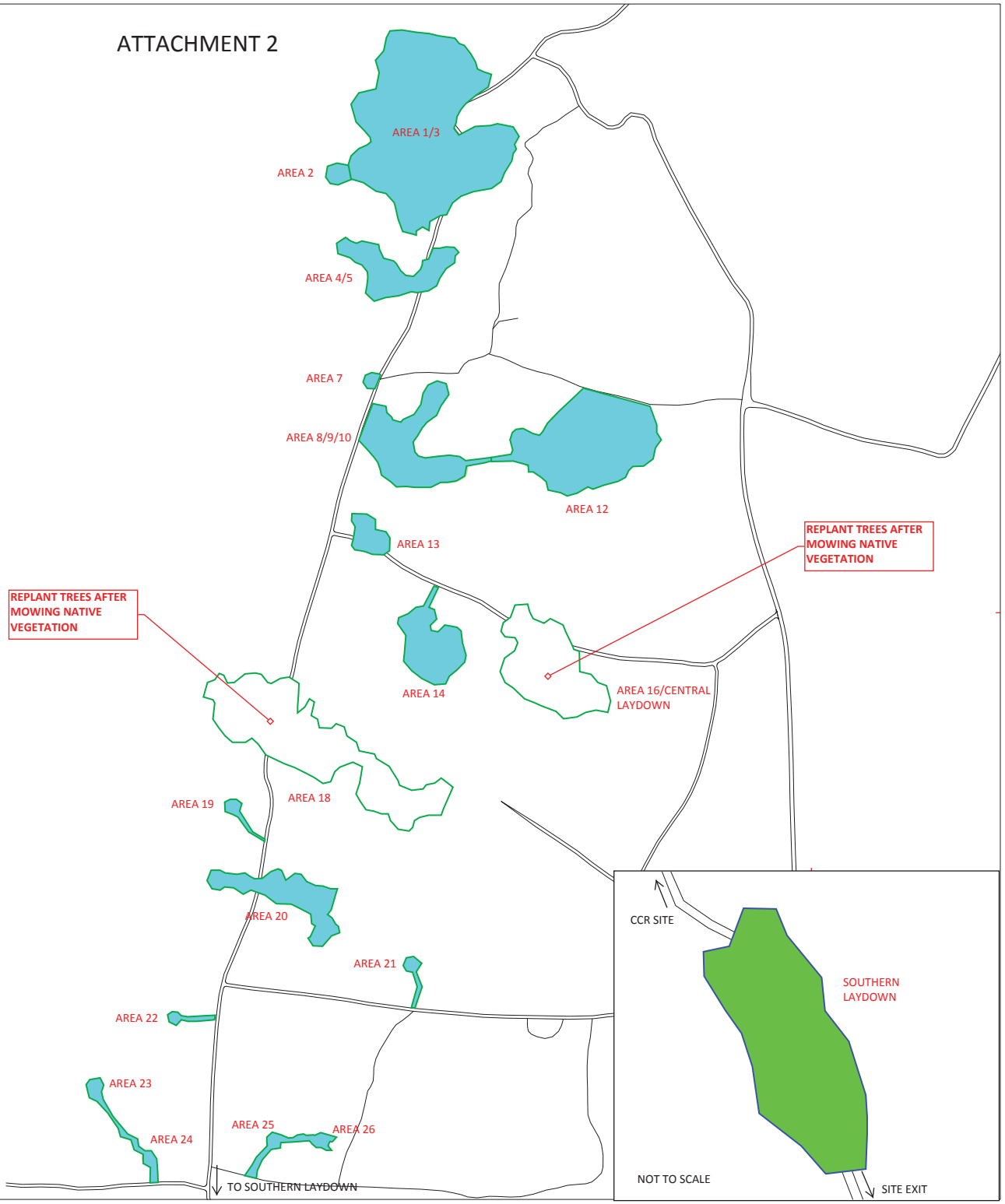
ATTACHMENT 2

Legend

- Roads
- ASSOCIATED CLEARED AREA FOR LONGLEAF PINE PLANTING
- LAYDOWN AREA - NATIVE VEGETATION
- COMPLETED AREA WITH TREES > 58.3% SURVIVAL
- COMPLETED AREA - NATIVE VEGETATION (READY FOR INSPECTION)



Map for informational purposes only. All boundaries are approximate and should not be used for any legal description of the boundaries.



ATTACHMENT 3 - PERMANENT VEGETATION TRACKING (YEAR 4, EVENT 1)

CHOCCOLOCCO CORRIDOR RANGES

Area	Acreage	% of Total Site Acreage	Permanent Vegetation Date(s)	% Coverage or Survival[a]	% Density[b]	Total % Complete	Coverage/Density Notes/Issues
SOUTH LAYDOWN	2.00	7.46%	08/01/17	100%	86%	7.46%	Area continues to fill in. High survival of permanent vegetation. No action needed.
1 PINES	3.26	12.16%	01/25/18	96%	N/A	12.16%	Seedling survey completed 10/26/18. % survival > target.
2 PINES	0.19	0.71%	01/25/18	100%	N/A	0.71%	Seedling survey completed 10/26/18. % survival > target.
3 PINES	3.47	12.95%	01/25/18	96%	N/A	12.95%	Seedling survey completed 10/26/18. % survival > target.
4/5 PINES	1.43	5.34%	01/25/18	79%	N/A	5.34%	Seedling survey completed 10/26/18. % survival > target.
7 PINES	0.07	0.26%	01/25/18	67%	N/A	0.26%	Seedling survey completed 10/26/18. % survival > target.
8/9/10 PINES	1.85	6.90%	01/25/18	78%	N/A	6.90%	Seedling survey completed 10/26/18. % survival > target.
12 PINES	3.57	13.32%	01/25/18	89%	N/A	13.32%	Seedling survey completed 10/26/18. % survival > target.
13 PINES	0.40	1.49%	01/25/18	100%	N/A	1.49%	Seedling survey completed 10/26/18. % survival > target. % survival estimated > 100% due to scaling, round down to 100%.
14 PINES	1.23	4.59%	01/25/18	79%	N/A	4.59%	Seedling survey completed 10/26/18. % survival > target.
16/ CENTRAL LAYDOWN PINES	2.34	8.73%	01/25/18	53%	N/A	0.00%	Seedline survey completed 10/26/18. % coverage below target. Impacted by native partridge pea in the area. Replant to get above target.
18 PINES	4.43	16.53%	01/25/18	9%	N/A	0.00%	Seedline survey completed 10/26/18. % coverage below target. Impacted by native partridge pea in the area. Replant to get above target.
19 PINES	0.16	0.60%	01/25/18	100%	N/A	0.60%	Seedling survey completed 10/26/18. % survival > target. % survival estimated > 100% due to scaling, round down to 100%.
20 PINES	1.26	4.70%	01/25/18	81%	N/A	4.70%	Seedling survey completed 10/26/18. % survival > target.
21 PINES	0.16	0.60%	01/25/18	67%	N/A	0.60%	Seedling survey completed 10/26/18. % survival > target.
22 PINES	0.16	0.60%	01/25/18	100%	N/A	0.60%	Seedling survey completed 10/26/18. % survival > target.
23 PINES	0.25	0.93%	01/25/18	83%	N/A	0.93%	Seedling survey completed 10/26/18. % survival > target.
24 PINES	0.16	0.60%	01/25/18	67%	N/A	0.60%	Seedling survey completed 10/26/18. % survival > target.
25 PINES	0.25	0.93%	01/25/18	83%	N/A	0.93%	Seedling survey completed 10/26/18. % survival > target.
26 PINES	0.16	0.60%	01/25/18	67%	N/A	0.60%	Seedling survey completed 10/26/18. % survival > target.
TOTALS	**26.80**	**100.00%**				**74.74%**	

[a] *% Coverage* indicated for areas vegetated with native grass. Requirement is 100% coverage.
% Survival indicated for areas with PINES planted. Required to be >=350/600 trees/acre or 58.33%

[b] *% Density* indicated for areas vegetated with native grass. Requirement is >=85% Density. Not applicable for PINE areas.

ATTACHMENT 4 – LONGLEAF PINE SURVIVAL

SURVEY PROCEDURE AND RESULTS

The procedure to evaluate Longleaf Pine Seedling survival at the former Ft. McClellan was established through evaluation of the literature and subsequent conversations with Keith Westlake (USFWS) and Paul Williams (Alabama Forestry Commission) to establish their typical and preferred methodologies for evaluating timber growth. The following documents from the literature were consulted:

- Southern Regional Extension Forestry "Measuring Survival and Planting Quality in New Pine Plantations"
- Natural Resources Conservation Service Texas Forestry Technical Note, TX-FS-12-4 (How to Quickly Check Behind a Plating Operation section)
- Woodland Technical Note OK-12 "Determining Tree Survivability Following Tree Planting

These documents have a generally consistent process for measuring pine survivability that is also what USFWS and AFC recommend based on conversations with them. Keith Westlake, manager of the Mountain Longleaf NWR, requested a 5% survey density of the pines planted at the Bain's Gap Road Ranges within the Refuge. HGL decided to continue the 5% sample density when surveying the plantings at the Choccolocco Corridor Ranges on Alabama State Forest land. The Alabama Forestry Commission requested a 2% sample density of the areas planted at CCR. HGL will adhere to the survival numbers described in the RAWP (350 per acre).

The survey procedure is as follows:

Step 1 – Randomly select the location of the correct number of survey plots for each sample area using the center of established sample grids as the sample location. For example, the BGRR Area 6-1 Pines section covers two acres, and would require 10 sample plots (at 1/100th of an acre each – see below) to yield a 5% per acre survey.

Step 2 – Locate selected survey plots using GPS.

Step 3 – Mark center of sample location with labeled wood stake so that stakeholders can replicate/QC work if they so desire.

Step 4 – Place a pin or nail in the stake, pull a steel tape 11.775 feet from the pin and establish a circle approximately 1/100th of an acre in area.

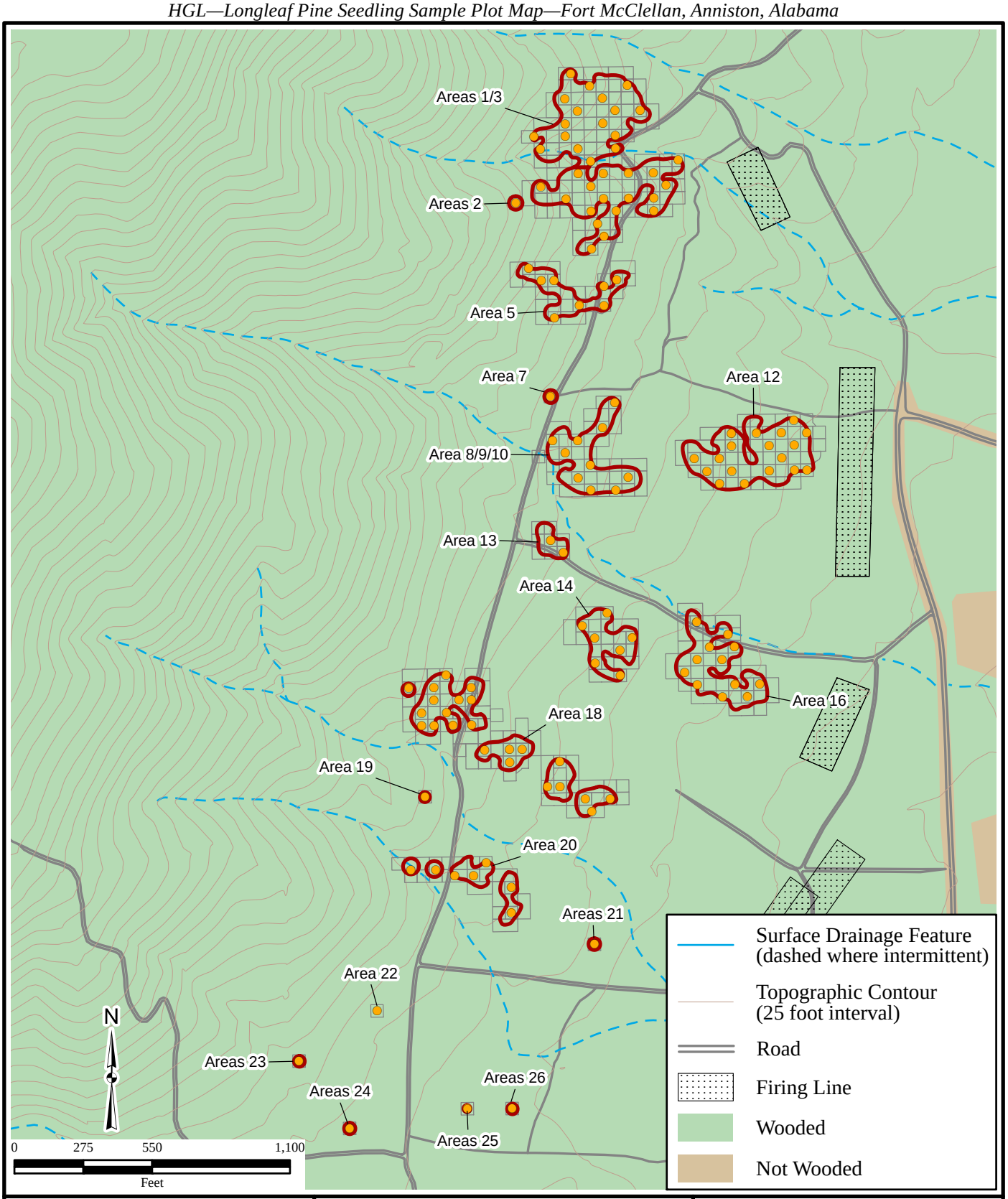
Step 5 – Count all live seedlings inside the circle and record results.

Step 6 – Average the survey data for each area by tallying the number of surviving seedlings identified in each plot and dividing the tally by the number of survey plots utilized to survey the area.

Step 7 – Multiply the result of the calculation in Step 6 by 100 to determine the estimated seedling survival for the given Area.

If the result of Step 7 is less than 350. Subtract the result of Step 7 from 600 and divide the result by 2. The quotient of this calculation yields the number of seedlings that will need to be replanted to meet the requirements outlined in the RAWP.

Note: The 1/100th acre plot size will be maintained in all sample areas. The 1/100th acre sample will exceed 5% of the total acreage of Area 2 and Area 7 at CCR but will still be used for consistency in approach.



\\gst-srv-01\HGLGIS\Ft_McClellan_MSIW\Longleaf_Pine_Seedling (2)Longleaf Pine Seedling Samp Choccolocco.mxd
10/18/2018 TB
Source: HGL, Shaw

Legend

- Sample Location
- Grid Cell
- Exceedance Contour (Original Delineation)

Figure 2
Longleaf Pine Seedling Sample Plot Map

Longleaf Pine Seedling Survey Results
Choccolocco Corridor Ranges

Area	Acreage	Plot Number	Grid Cell	Sample Plot Coordinates *		Surveyed Seedling Count
				UTM_X	UTM_Y	
Area 1/3	6.73	1	9	619619.281	3733588.265	5
		2	12	619664.9897	3733588.782	10
		3	15	619588.9809	3733572.684	5
		4	18	619634.6896	3733573.201	9
		5	24	619604.3895	3733557.62	5
		6	27	619650.0981	3733558.137	7
		7	29	619680.5707	3733558.482	5
		8	33	619589.3256	3733542.212	4
		9	36	619635.0343	3733542.729	6
		10	44	619589.4979	3733526.975	4
		11	48	619650.4428	3733527.665	6
		12	50	619559.1978	3733511.394	5
		13	53	619604.9065	3733511.911	3
		14	56	619650.6151	3733512.428	6
		15	61	619620.315	3733496.848	2
		16	67	619726.9687	3733498.054	7
		17	70	619605.2511	3733481.439	7
		18	72	619635.7235	3733481.784	5
		19	74	619666.196	3733482.128	5
		20	76	619696.6685	3733482.473	7
		21	80	619559.7147	3733465.686	6
		22	84	619620.6597	3733466.375	5
		23	90	619712.0771	3733467.409	11
		24	95	619590.3595	3733450.794	5
		25	98	619636.0682	3733451.311	6
		26	100	619666.5407	3733451.656	6
		27	102	619697.0132	3733452	6
		28	109	619621.0043	3733435.903	5
		29	111	619651.4768	3733436.247	5
		30	114	619697.1855	3733436.764	9
		31	122	619636.5852	3733405.602	7
		32	125	619621.5213	3733390.194	3
		33	001/002	619596.2544	3733603.243	6
		34	041/042	619551.4073	3733526.545	2
		35	117/118	619628.7947	3733420.753	6
					Total Live Seedlings by Actual Count	201
					Estimated Live Seedlings per Acre	574
					Estimated Live Seedlings in Area	3865
					Seedlings Planted in Area on 01/25/18	4038
					Estimated Seedling Survival Rate	**96%**
Area 2	0.19	1	126	619529.1529	3733446.183	6
					Total Live Seedlings by Actual Count	6
					Estimated Live Seedlings per Acre	600
					Estimated Live Seedlings in Area	114
					Seedlings Planted in Area on 01/25/18	114
					Estimated Seedling Survival Rate	**100%**

Area	Acreage	Plot Number	Grid Cell	Sample Plot Coordinates *		Surveyed Seedling Count
				UTM_X	UTM_Y	
Area 4/5	1.43	1	128	619545.0621	3733366.838	4
		2	135	619560.4707	3733351.774	6
		3	136	619575.7069	3733351.947	5
		4	138	619651.8881	3733352.808	1
		5	150	619606.524	3733321.819	7
		6	152	619636.6226	3733321.365	6
		7	154	619576.2238	3733306.238	5
		8	137/145	619636.738	3733345.018	4
					Total Live Seedlings by Actual Count	38
					Estimated Live Seedlings per Acre	475
					Estimated Live Seedlings in Area	679
					Seedlings Planted in Area on 01/25/18	858
					Estimated Seedling Survival Rate	**79%**
Area 7	0.7	1	157	619571.3398	3733211.161	4
					Total Live Seedlings by Actual Count	4
					Estimated Live Seedlings per Acre	400
					Estimated Live Seedlings in Area	280
					Seedlings Planted in Area on 01/25/18	420
					Estimated Seedling Survival Rate	**67%**
Area 8/9/10	1.85	1	159	619649.7663	3733204.032	3
		2	166	619634.8747	3733173.388	5
		3	168	619574.102	3733157.462	5
		4	170	619604.5745	3733157.807	5
		5	174	619589.5105	3733142.398	5
		6	180	619620.1554	3733127.507	4
		7	187	619605.0914	3733112.098	6
		8	191	619666.0364	3733112.787	6
		9	195	619620.5	3733097.034	3
		10	197	619650.9724	3733097.379	5
					Total Live Seedlings by Actual Count	47
					Estimated Live Seedlings per Acre	470
					Estimated Live Seedlings in Area	870
					Seedlings Planted in Area on 01/25/18	1110
					Estimated Seedling Survival Rate	**78%**

Area	Acreage	Plot Number	Grid Cell	Sample Plot Coordinates *		Surveyed Seedling Count
				UTM_X	UTM_Y	
Area 12	3.57	1	205	619867.6834	3733182.305	5
		2	209	619791.6745	3733166.207	5
		3	211	619822.1469	3733166.552	4
		4	213	619852.6194	3733166.897	5
		5	215	619883.0919	3733167.241	4
		6	221	619791.8468	3733150.971	5
		7	224	619837.5555	3733151.488	5
		8	226	619868.028	3733151.833	4
		9	230	619746.3104	3733135.218	6
		10	232	619776.7828	3733135.563	6
		11	237	619852.9641	3733136.424	5
		12	241	619761.7189	3733120.154	6
		13	243	619792.1914	3733120.499	6
		14	246	619837.9001	3733121.016	7
		15	248	619868.3726	3733121.36	5
		16	249	619883.6089	3733121.532	7
		17	251	619777.1275	3733105.09	7
		18	253	619807.6	3733105.435	4
					Total Live Seedlings by Actual Count	96
					Estimated Live Seedlings per Acre	533
					Estimated Live Seedlings in Area	1904
					Seedlings Planted in Area on 01/25/18	2142
					Estimated Seedling Survival Rate	**89%**
Area 13	0.4	1	261	619571.7171	3733036.453	5
		2	265	619587.1256	3733021.389	8
					Total Live Seedlings by Actual Count	13
					Estimated Live Seedlings per Acre	650
					Estimated Live Seedlings in Area	260
					Seedlings Planted in Area on 01/25/18	240
					Estimated Seedling Survival Rate	**108%**
Area 14	1.23	1	268	619640.324	3732948.295	4
		2	270	619610.0238	3732932.714	7
		3	277	619625.4324	3732917.65	4
		4	280	619671.1411	3732918.167	5
		5	283	619656.0771	3732902.759	6
		6	285	619625.777	3732887.178	7
		7	291	619656.4217	3732872.286	0
					Total Live Seedlings by Actual Count	33
					Estimated Live Seedlings per Acre	471
					Estimated Live Seedlings in Area	580
					Seedlings Planted in Area on 01/25/18	738
					Estimated Seedling Survival Rate	**79%**

Area	Acreage	Plot Number	Grid Cell	Sample Plot Coordinates *		Surveyed Seedling Count
				UTM_X	UTM_Y	
Area 16	2.34	1	295	619749.2667	3732937.155	0
		2	306	619764.8476	3732906.855	4
		3	308	619795.3201	3732907.199	0
		4	311	619749.7836	3732891.446	5
		5	313	619780.2561	3732891.791	0
		6	316	619734.7197	3732876.038	5
		7	324	619750.1282	3732860.974	4
		8	327	619795.837	3732861.491	6
		9	329	619826.3094	3732861.835	1
		10	333	619780.773	3732846.082	4
		11	335	619811.2455	3732846.427	3
		12	302/303	619787.5296	3732922.349	6
					Total Live Seedlings by Actual Count	38
					Estimated Live Seedlings per Acre	317
					Estimated Live Seedlings in Area	741
					Seedlings Planted in Area on 01/25/18	1404
					Estimated Seedling Survival Rate	**53%**
			Number of Seedlings to be Replanted per Acre			**142**
			Total Number of Seedlings to be Replanted			**332**
Area 18	4.43	1	344	619444.5149	3732872.756	1
		2	347	619398.9785	3732857.003	0
		3	349	619429.451	3732857.347	8
		4	352	619475.1597	3732857.864	0
		5	356	619429.6233	3732842.111	4
		6	358	619460.0957	3732842.456	0
		7	359	619475.332	3732842.628	0
		8	362	619414.5593	3732826.703	0
		9	364	619445.0318	3732827.047	0
		10	370	619414.7316	3732811.466	0
		11	371	619429.9679	3732811.639	0
		12	374	619475.6765	3732812.156	0
		13	388	619491.2574	3732781.855	0
		14	390	619521.7298	3732782.2	0
		15	391	619536.966	3732782.372	0
		16	396	619521.9021	3732766.964	0
		17	401	619582.847	3732767.653	0
		18	406	619567.9554	3732737.008	0
		19	407	619583.1916	3732737.181	0
		20	416	619613.8364	3732722.289	0
		21	418	619644.3088	3732722.633	0
		22	372/373	619452.7728	3732811.679	0
		23	421/422	619621.6268	3732707.139	0
					Total Live Seedlings by Actual Count	13
					Estimated Live Seedlings per Acre	57
					Estimated Live Seedlings in Area	250
					Seedlings Planted in Area on 01/25/18	2658
					Estimated Seedling Survival Rate	**9%**
			Number of Seedlings to be Replanted per Acre			**272**
			Total Number of Seedlings to be Replanted [2]			**2658**

Area	Acreage	Plot Number	Grid Cell	Sample Plot Coordinates *		Surveyed Seedling Count
				UTM_X	UTM_Y	
Area 19	0.16	1	399	619418.9658	3732724.908	8
					Total Live Seedlings by Actual Count	8
					Estimated Live Seedlings per Acre	800
					Estimated Live Seedlings in Area	128
					Seedlings Planted in Area on 01/25/18	96
					Estimated Seedling Survival Rate	**133%**
Area 20	1.26	1	430	619493.2078	3732644.486	4
		2	436	619477.744	3732629.321	4
		3	443	619524.0051	3732614.812	5
		4	448	619523.9696	3732584.129	4
		5	424/431	619401.4767	3732636.078	7
		6	426/433	619431.9492	3732636.422	6
		7	434/435	619454.8897	3732629.062	4
					Total Live Seedlings by Actual Count	34
					Estimated Live Seedlings per Acre	486
					Estimated Live Seedlings in Area	612
					Seedlings Planted in Area on 01/25/18	756
					Estimated Seedling Survival Rate	**81%**
Area 21	0.16	1	452	619624.8849	3732545.885	4
					Total Live Seedlings by Actual Count	4
					Estimated Live Seedlings per Acre	400
					Estimated Live Seedlings in Area	64
					Seedlings Planted in Area on 01/25/18	96
					Estimated Seedling Survival Rate	**67%**
Area 22	0.16	1	453	619360.4725	3732465.001	6
					Total Live Seedlings by Actual Count	6
					Estimated Live Seedlings per Acre	600
					Estimated Live Seedlings in Area	96
					Seedlings Planted in Area on 01/25/18	96
					Estimated Seedling Survival Rate	**100%**
Area 23	0.25	1	454	619265.5707	3732403.901	5
					Total Live Seedlings by Actual Count	5
					Estimated Live Seedlings per Acre	500
					Estimated Live Seedlings in Area	125
					Seedlings Planted in Area on 01/25/18	150
					Estimated Seedling Survival Rate	**83%**
Area 24	0.16	1	455	619326.984	3732322.243	4
					Total Live Seedlings by Actual Count	4
					Estimated Live Seedlings per Acre	400
					Estimated Live Seedlings in Area	64
					Seedlings Planted in Area on 01/25/18	96
					Estimated Seedling Survival Rate	**67%**

Area	Acreage	Plot Number	Grid Cell	Sample Plot Coordinates *		Surveyed Seedling Count
				UTM_X	UTM_Y	
Area 25	0.25	1	456	619470.3339	3732346.16	5
					Total Live Seedlings by Actual Count	5
					Estimated Live Seedlings per Acre	500
					Estimated Live Seedlings in Area	125
					Seedlings Planted in Area on 01/25/18	150
					Estimated Seedling Survival Rate	**83%**
Area 26	0.16	1	457	619524.8077	3732346.342	4
					Total Live Seedlings by Actual Count	4
					Estimated Live Seedlings per Acre	400
					Estimated Live Seedlings in Area	64
					Seedlings Planted in Area on 01/25/18	96
					Estimated Seedling Survival Rate	**67%**

* Coordinate System: NAD 1983 UTM Zone 16N

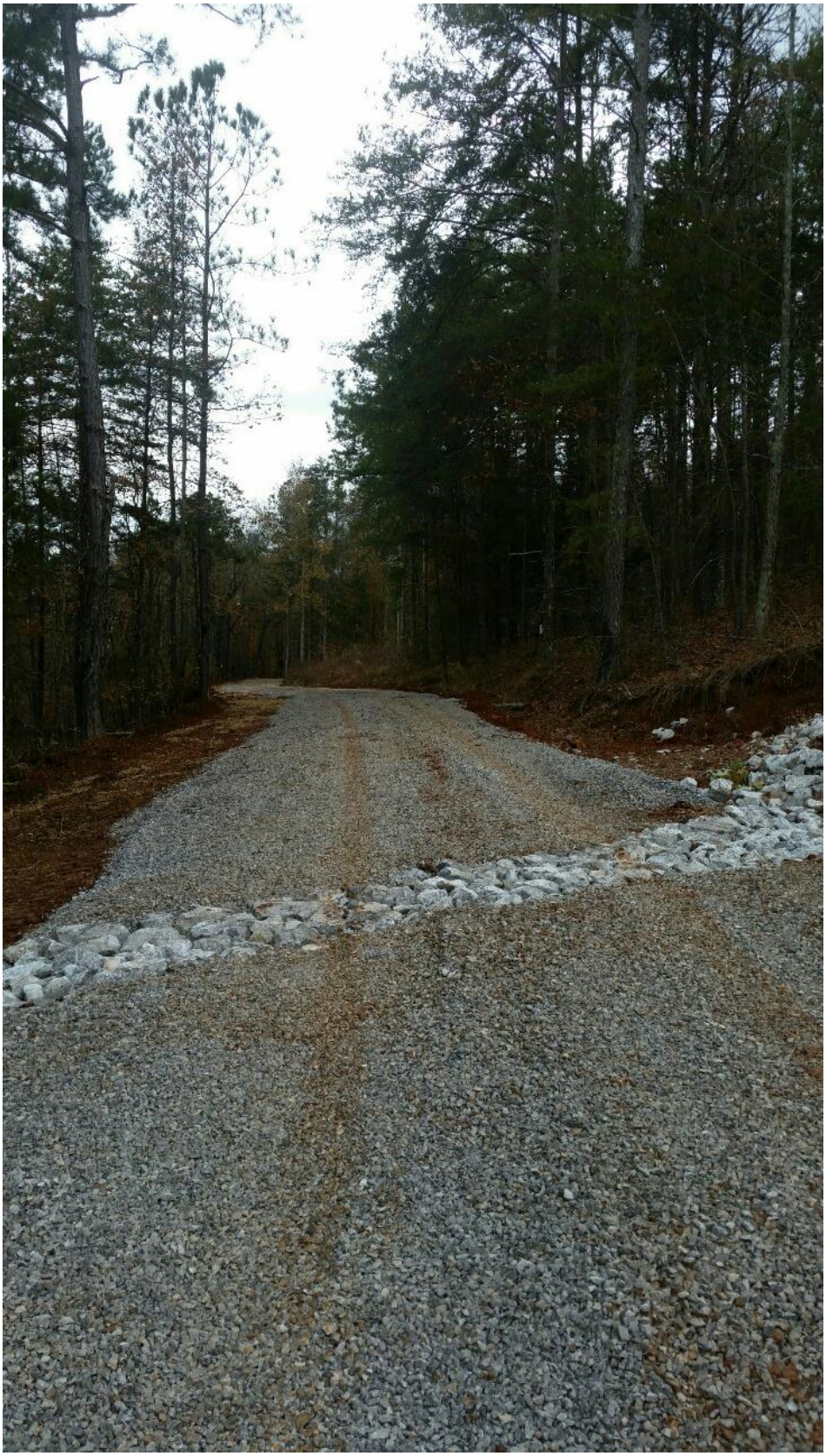
ATTACHMENT 5 – PHOTOGRAPHS

CCR – Repairs at Temporary Road Near Areas 1 and 2

CCR – Riprap on Area 2 Slope

CCR – Repair of Haul Road Near Areas 1/3 and 2

CCR – Repair of Haul Road Near Area 4 with Riprap Drain



CCR – Haul Road from Area 4 to Areas 8/9/10 with Riprap Drain

CCR – Repair of Temporary Roads at Areas 1/2 with Riprap Row at Gully

CCR – Repair of Central Road Downslope of Area 18

February 13, 2019

Melissa L. Shirley, P.E.
Contracting Officer Representative
U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, AL 36602

Re: Maintenance of Erosion Control Features and Vegetation, Letter Report of Activities (FINAL), Year 4, Event 1, *Ranges Near Training Area T-24A*, Environmental Remediation Services at Four Sites, Fort McClellan, Anniston, AL
Contract: W912DY-10-D-0023, Task Order No. CK01
HGL Project Number: H10501

Dear Ms. Shirley:

HydroGeoLogic, Inc. (HGL) is pleased to submit this letter report documenting the activities associated with maintenance of erosion control features and vegetation at the Ranges Near Training Area T-24A (T-24A) at the former Fort McClellan (FTMC) in Anniston, Alabama. This report covers Year 4, Event 1, and documents erosion control and vegetation maintenance efforts undertaken since the previous maintenance event for the site under the above-referenced project. This documentation supports Project Milestone 420.01 as described in the PMP/QASP and project schedule and will serve as backup for invoicing purposes.

BACKGROUND AND OBJECTIVES

The former FTMC occupied 45,679 acres in the foothills of the Appalachian Mountains of northeastern Alabama, near the City of Anniston in Calhoun County. FTMC is approximately 74 miles (119 km) north-northeast of Birmingham, Alabama, and consists of three tracts of land: The Main Post, the Choccolocco Corridor, and Pelham Range. The former FTMC is not a National Priorities List site under the Comprehensive Environmental Response, Compensation, and Liability Act, 42 United States Code Annotated §9605.

T-24A is in the southeastern portion of the former FTMC main post. The site is currently owned by U.S. Fish and Wildlife Service (USFWS) and located within the boundaries of the Mountain Longleaf National Wildlife Refuge. The T-24A ranges were used for various military training activities, including chemical munitions disposal and decontamination, demolition and free-from explosives work, smoke generation and fog oil storage, and small-caliber weapons firing. The site includes all or portions of the following parcels:

- Training Area T-24A, Former Chemical Munitions Disposal Area, Parcel 187(7);
- Range 24A, Former Multi-Purpose Range, Parcel 108(7)/82Q-X;
- Range 24A, Fog Oil Drum Storage, Parcel 88(6);
- Former Machine Gun Range, Parcel 112Q;
- Former Demolition Area, Parcel 113Q-X;
- Former Bandholtz Machine Gun Qualification Range, Parcel 213Q; and
- Former Bandholtz Field Firing Range No. 2, Parcel 214Q.

A Remedial Action (RA) consisting of site preparation; XRF screening and analysis for contaminant delineation; excavation of metals-contaminated soil and soil stabilization as necessary; post-excavation confirmation sampling and analysis; waste characterization sampling and analysis; transportation and disposal of waste soil; backfilling and re-grading; and site re-vegetation was undertaken from April 2015 through December 2015, with follow-up planting of permanent vegetation in Spring 2016.

This event is one of six events for follow-up inspection and maintenance of erosion controls and vegetation ("maintenance phase"). The objective of the maintenance phase is to ensure that the areas of the site impacted by the RA construction are controlled to prevent erosion and sediment runoff from the site to the maximum extent practicable through inspection of vegetation and remaining engineered erosion control features, with corrective maintenance as necessary. The six events include:

- Year 3, Event 1 – completed July 2017
- Year 3, Event 2 – completed April 2018
- Year 4, Event 1 – completed from August 2018 to November 2018
- Year 4, Event 2 – on or about December 12, 2018
- Year 5, Event 1 – on or about March 16, 2019
- Year 5, Event 2 - on or about August 18, 2019

This letter report incorporates routine maintenance activities at T-24A occurring for Year 4, Event 1.

SUMMARY OF ACTIVITIES AND OPERATIONS PERFORMED

Erosion Controls:

Attachment 1 shows the configuration of erosion controls remaining at the site. Each of the remaining controls was inspected during Year 4, Event 1 on 11 September 2018 and found to be in good working order and of an integrity suitable for performing their intended function going forward.

In addition to the site erosion controls, HGL and APTIM inspected the primary stream crossing at the site, which had washed out during a previous rainstorm as a result of high velocity and volume of water. Photographs of the area are provided in Attachment 5. Due to the configuration of the channel in this area, it was determined that it would be more favorable to move the low water crossing approximately 1,000 feet further upstream to the south of the current location. A plan for doing so was discussed with the USFWS Refuge Manager Mr. Keith Westlake on 12 September 2018 and provided to the project stakeholders (Attachment 2).

In accordance with the plan APTIM performed the following maintenance activities at the site in November 2018:

- Repaired/cleared approximately 1,300 feet of back road at the site to provide an access to the new low water crossings including clearing an area of dense native vegetation, removal of two large trees blocking the road, and navigation of a steep eroded slope.
- Utilized riprap, stone and crusher run to improve and repair the back road and create a road deck through the wet features, including two creeks, two seeps/springs, and an existing mudhole/wet area. Developed water bars on the back road to direct water off the back road.

- Utilized riprap to rock armor the steep slope into Area 11 along the back road and diverted stormwater from Area 11 off the steep slope.
- Constructed two new low water crossings by reworking and sloping the approaches to the creek to 1V:10H to accommodate vehicle traffic and prevent water damming, and preparing the crossings with a rock foundation and deck.
- Reshaped the original low water crossing to match the existing channel to provide uninterrupted flow and placed large stone on the main roadway to prevent vehicle access to the creek.

Photographs of completed work are provided in Attachment 5.

Vegetation:

Temporary Vegetation:

No longer applicable. The vegetation at the site was inspected during the event and all areas were observed to be completely or very near completely covered with permanent vegetation as described below.

Permanent Vegetation:

Vegetation inspections of T-24A were conducted during the event in August 2018. The objective of these inspections was to identify any eroded areas which required repair and to identify areas where permanent vegetation did not cover 100% of the soil surface with a density of 85% or greater as defined by the Construction Best Management Practices Plan (CBMPP). A site plan showing the inspected areas and vegetation progress is included as Attachment 3.

Permanent vegetation was observed to be dominant at the site. Areas 1-2, 2-1/2-2, 3, 4/5, 10-1, 10-2, 10-3, 11, 12, North Laydown, South Laydown and the New Well Area were determined to meet the requirements for completeness, along with Areas 1-1, 1-3, 6 and 6/9, which were determined to be complete in inspections for previous events. Areas 7/East Laydown has progressed significantly since the previous inspection and is approximately 5% from being fully covered. This area is expected to fill in through natural reseeding during the next cycle and did not require additional work during this event.

Turbidity Monitoring:

HGL continued to inspect the site and monitor turbidity during the maintenance period in accordance with the CBMPP at the primary turbidity sampling point identified in Attachment 1. No turbidity issues were noted during the maintenance period.

FINDINGS SUMMARY

Year 4, Event 1 inspections of T-24A identified no active erosion, with the exception of the washed-out low water crossing, and all areas are completely or near completely covered with permanent vegetation. Turbidity measurements for applicable rainfall events have shown no issues that exceed State of Alabama Construction General Permit requirements (delta of 50 NTUs between background and turbidity monitoring points).

As noted above, only one area has vegetation not yet complete and should continue to fill in with permanent vegetation naturally. A synopsis of T-24A sub-areas, vegetation date, and percent vegetation completion is included as Attachment 4.

Major activities/findings are summarized below:

- Permanent vegetation uniformly covers 100% of the soil surface with a density of 85% or greater in areas 1-1, 1-2, 1-3, 2-1/2-2, 3, 4/5, 6, 6/9, 10-1, 10-2, 10-3, 11, 12, North Laydown, South Laydown and the New Well Area. These areas have been inspected and approved by U.S. Army Corps of Engineers as well, and no additional action was required.
- Area 7/East Laydown should continue to fill in through the natural reseeding cycle.
- The previous low water crossing was successfully relocated upstream and the previous low water crossing restored to the condition of the surrounding channel.

CONCLUSIONS

The erosion controls at the site continue to perform as intended and the site is protected from erosion with a cover of annual and/or permanent vegetation in all areas. HGL will continue to monitor progress of vegetation growth at the site and will address any erosion issues or vegetation of remediated areas in accordance with the previously noted maintenance schedule.

Please call or email me at (210) 477-2215, dreasons@hgl.com should you have any questions or comments concerning this document.

Sincerely,

David S. Reasons, PMP
Project Manager

Attachments:

1. Final Restoration Figure
2. Plan for Relocation of Lower Water Crossing
3. Vegetation Inspection Areas Figure (Annotated)
4. T-24A Permanent Vegetation Tracking Table
5. Photographs

cc: Jeffrey Tarr, APTIM
James O'Quinn, HydroGeoLogic, Inc.
Linda Bookout, USACE Mobile
Owen Nuttall, FTMC Army Transition Force
Lisa Holstein, FTMC Army Transition Force
Bill Shanks, FTMC Army Transition Force

ATTACHMENTS

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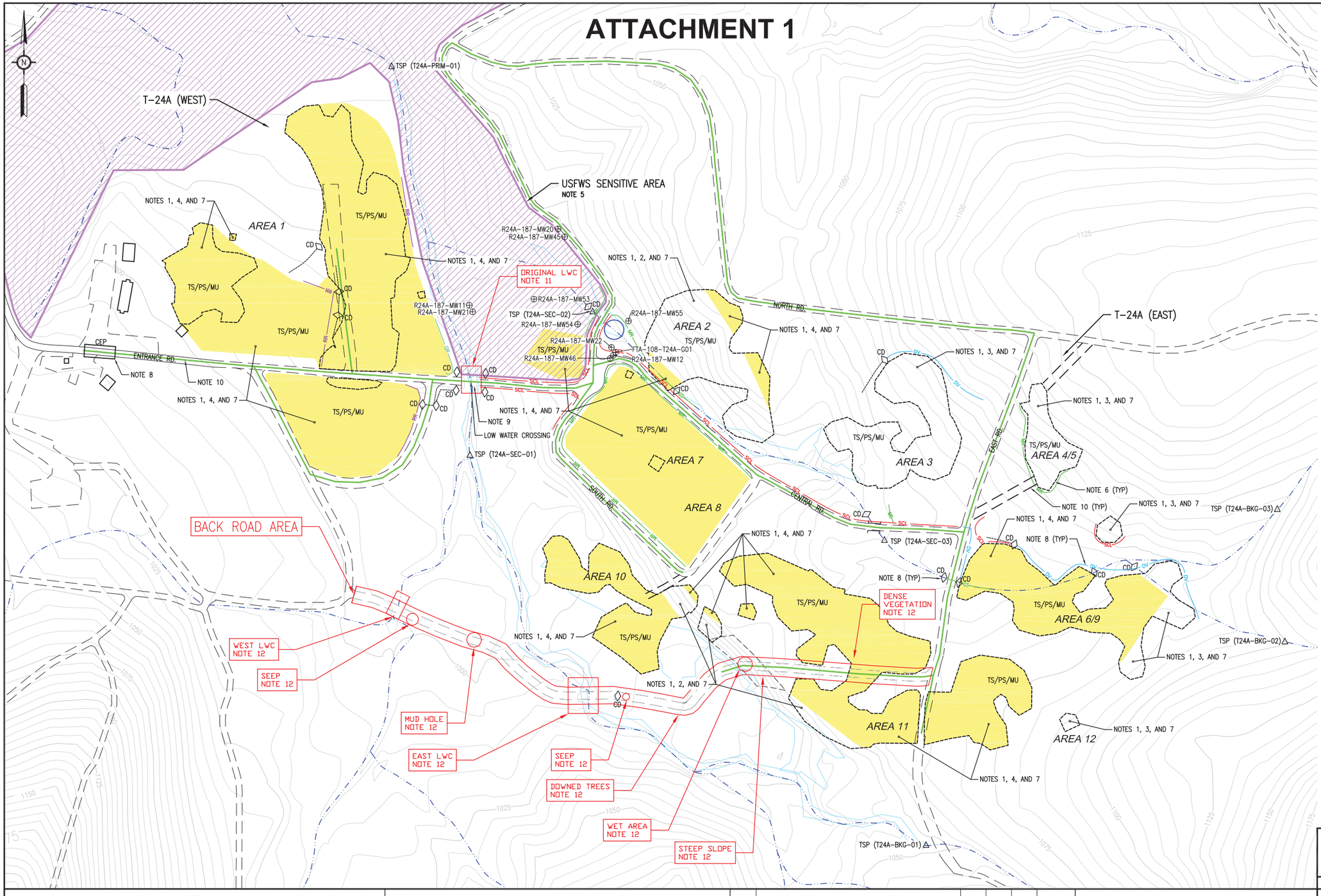
ATTACHMENT 1



LEGEND:

- EXISTING IMPROVED ROAD
- EXISTING UNIMPROVED ROAD
- EXISTING UNIMPROVED ROAD TO BE USED AS HAUL ROAD (TO BE IMPROVED AS NEEDED)
- TEMPORARY ROAD
- EXCAVATION BOUNDARY
- HYDROMULCH WITH TENSAR™ HYDRA CX EXTREME SLOPE MATRIX OR EQUAL.
- HYDROMULCH WITH TENSAR™ HYDRA CM STEEP SLOPE MATRIX OR EQUAL.
- HYDROMULCH WITH TENSAR™ HYDRA GS MILD SLOPE MULCH BLEND OR EQUAL.
- 1150 TOPOGRAPHIC CONTOUR
- STREAM
- DV DIVERSION
- GR GRAVEL ROW
- MR MULCH ROW
- RR ROCK ROW
- SCL SEDIMENT BARRIER (SEDIMENT CONTROL LOGS)
- NATURAL DIVERSION
- ◊ ROCK CHECK DAM (CD)
- CONSTRUCTION EXIT PAD (CEP)
- TEMPORARY STREAM CROSSING (TSC)
- ⊕ MONITORING WELL
- △ TURBIDITY SAMPLING POINT (TSP)
- TS/PS/MU TEMPORARY SEEDING/PERMANENT SEEDING/MULCHING
- ○ PLUNGE POOL

NOTES:

1. SEED BY SEED DRILLING PRIOR TO MULCHING. TEMPORARY SEED FROM SEPTEMBER 1 TO NOVEMBER 1. PERMANENT SEED FROM MARCH 15 TO JULY 15.
2. HYDROMULCH WITH TENSAR™ HYDRA CX EXTREME SLOPE MATRIX OR EQUAL.
3. HYDROMULCH WITH TENSAR™ HYDRA CM STEEP SLOPE MATRIX OR EQUAL.
4. HYDROMULCH WITH TENSAR™ HYDRA GS MILD SLOPE MULCH BLEND OR EQUAL.
5. USFWS SENSITIVE AREA NOT TO BE DISTURBED.
6. SEDIMENT BARRIERS TO REMAIN IN PLACE DURING RESTORATION. REMOVE AFTER ARMY APPROVAL OF FINAL STABILIZATION.
7. IRRIGATE AND MAINTAIN SEEDED AREAS UNTIL ESTABLISHING A HEALTHY STAND OF VEGETATION OR AS DIRECTED BY USFWS.
8. CHECK DAMS, DIVERSION AND OUTLET PROTECTION, AND CONSTRUCTION EXIT PADS TO REMAIN IN PLACE OR MODIFIED AND/OR REMOVED AS DIRECTED BY USFWS.
9. TEMPORARY STREAM CROSSING CONVERTED TO A LOW WATER CROSSING.
10. TEMPORARY ROADS TO REMAIN IN PLACE IF REQUESTED BY USFWS.
11. IN NOVEMBER 2018, THE ORIGINAL LOW WATER CROSSING (LWC) WAS RESHAPED TO MATCH THE EXISTING CHANNEL. LARGE BOULDERS WERE PLACED ON THE MAIN ROADWAY AS A SAFETY PRECAUTION TO PREVENT VEHICLE ACCESS TO THE CREEK.
12. IN NOVEMBER 2018, APPROXIMATELY 1,300 FEET OF THE BACK ROAD WAS REPAIRED BY APPLYING RIP RAP, #57 STONE AND CRUSHER RUN TO CREATE A ROAD DECK THROUGH THE VARIOUS FEATURES.TREES BLOCKING THE ROAD WERE REMOVED AND RIPRAP WAS APPLIED TO ROCK ARMOR THE STEEP SLOPE INTO AREA 11 AND DIVERT STORMWATER. TWO NEW LOW WATER CROSSINGS WERE ALSO CONSTRUCTED BY REWORKING/SLOPING THE APPROACHES TO THE CREEK AT 1V:10H TO ACCOMMODATE VEHICLE TRAFFIC AND PREPARING THE CROSSINGS WITH ROCK FOUNDATIONS AND DECK.

0 20 60 100 150 200ft

ORIGINAL SCALE 1"=100'-0"

FORT McCLELLAN, ANNISTON, AL
DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS

CLIENT DWG NO:

NOTES

DETAIL CALLOUT KEY

DETAIL NUMBER

DRAWING NUMBER WHERE DETAIL CAN BE FOUND

NOTE: TYPICAL (TYP) – IDENTIFIES A DETAIL CALLOUT FOR A PARTICULAR SYMBOL AS APPLICABLE FOR THAT SAME SYMBOL REPEATED ELSEWHERE ON THE DRAWING.

REFERENCE DRAWINGS

NO.	REVISION	DRAWN	CK'D	APPD	DATE
4	UPDATED FOR OPTION YR4 EVENT 1 REPORT	SAB	KJH	KJH	01/21/19
3	UPDATED FOR OPTION YR3 EVENT 1 REPORT	SAB	GDS	GDS	11/02/17
2	RESTORATION REVISED BASED ON POST-EXCAVATION SURVEY	CFB	GDS	GDS	11/03/15
1	RESTORATION REVISED BASED ON REVISED ZINC AND LEAD DELINEATION	CFB	GDS	GDS	06/03/15

APTIM

DRAWN: CFB | CK'D: GDS | APPD: GDS | DATE: 03/26/15 | SCALE: 1" = 100'

RANGES NEAR TRAINING AREA T-24A

FINAL RESTORATION

FOR: REMEDIAL ACTION WORK PLAN APPENDIX F

PROJECT NO: 500290 | DWG NO: F-4 | REV: 4

Form: CMS-830-00-FM-02104 CB ANSI D.dwg

File: 500290-001-CV-08-F1_F8.dwg
Plot Date/Time: Jan 23, 2019 - 5:15pm
Plotted By: charles.bentley

ATTACHMENT 2

"FIX-IT" PLAN FOR ADDRESSING ISSUES AT FTMC SITES DERIVED FROM RECENT INSPECTIONS/MEETINGS

HGL and APTIM (HGL Team) plans to mobilize a work force, equipment, and materials to perform the tasks described below for T24A. One mobilization is planned to complete the work. The HGL Team will provide all necessary construction equipment to complete the work that may include the following:

- Excavator
- Loader
- Dozer
- Off-road dump; and
- Mini-Excavator

The labor effort will include a construction manager, health and safety officer, one to two heavy equipment operators, one truck driver, and one laborer.

Background and description of the "Fix-it" plan are as follows:

T24A "Fix-it" Plan

James O'Quinn (HGL), Keith Westlake (USFWS), Jeff Tarr (APTIM), and Gregory Swanson (APTIM) met Tuesday afternoon, September 11, 2018 at T24A to discuss location and construction of a replacement low water crossing (LWC). Previous storms washed out the original LWC. Keith Westlake of USFWS proposed relocating the LWC approximately 1000 feet upstream, south of the original site. Construction of the new LWC will include repairing approximately 1300 feet of back road from south of the West Laydown Area to Area 11. The "back road" crosses the following natural features:

1. Two creeks
2. Two seeps/springs
3. One mud hole
4. One wet area
5. Steep eroded slope
6. Dense native seed vegetation

During the site visit, two large trees blocked the back road and therefore will be removed to allow easy access for repairs/upgrades to the roadway.

It should be noted rock is located onsite for repairs, constructing wet feature crossings, and armoring areas susceptible to erosion. If additional rock is needed, the HGL Team will have it delivered to the site. Please note rock is located onsite at the following locations:

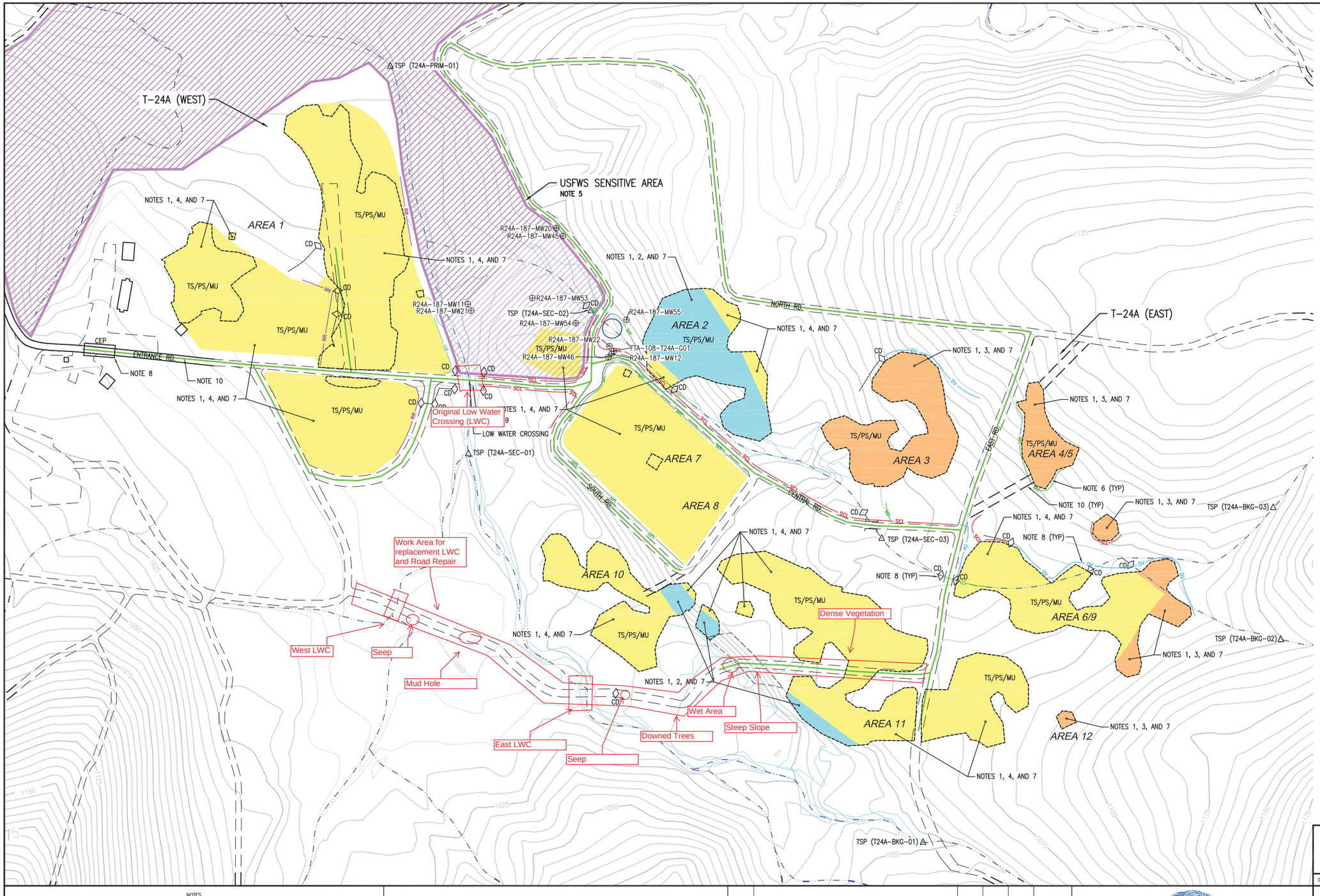
1. Remnant rip rap and stone at the original LWC
2. Two piles of mixed rock northwest of the original LWC in Area 1
3. One pile of rip rap at USFWS laydown yard at entrance to T24A
4. One pile of mixed rock at USFWS laydown yard
5. USFWS crusher run at USFWS laydown yard

The creek channel at the original LWC will be re-shaped to match the existing channel to promote uninterrupted positive flow. To prevent unnecessary vehicle access and as a safety precaution, large stones will be placed on the main roadway leading to the original LWC to prevent vehicle access to the creek.

Both proposed LWC locations are generally at grade, but the approaches will need reworking and sloped back. The banks to the creek crossings shall be cutback approximately 1V:10H to easily accommodate vehicle traffic and prevent water damming. The crossing will be prepared with rock foundation and deck. The HGL Team will provide a rock pile at the newly constructed LWC for future use prior to demobilization. Bank and sidewalls will be armored with rock as needed.

Stone and crusher run will be used to improve and repair the back road and fill gaps between riprap foundation to create road deck through the wet features. Riprap foundation is comprised of riprap compacted into the subsurface to provide a stable armored surface. Riprap and stone will be used for armoring where needed. Water bars on the back road will be developed where appropriate to direct water off the back road.

The HGL Team will rock the steep slope into Area 11. Stormwater from Area 11 will be diverted from the steep slope. The work effort is anticipated to take approximately two weeks to complete. Attached is the most recent site drawing of T24A with various features including the “back road”.



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0 20 60 100 150 200ft
ORIGINAL SCALE 1"=100'-0"

NOTES

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NO.	REVISION	DRAWN	CK'D	APPD	DATE
3	UPDATED FOR OPTION YR3 EVENT 1 REPORT	SAB	GDS	GDS	11/02/17
2	RESTORATION REVISED BASED ON POST-EXCAVATION SURVEY	CFB	GDS	GDS	11/03/15
1	RESTORATION REVISED BASED ON REVISED ZINC AND LEAD DELINEATION	CFB	GDS	GDS	06/03/15

REFERENCE DRAWINGS

DRAWN: CFB | CK'D: GDS | APPD: GDS | DATE: 03/26/15 | SCALE: 1" = 100'

FORT McCLELLAN, ANNISTON, AL
DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS

CLIENT DWG NO:

RANGES NEAR TRAINING AREA T-24A
FINAL RESTORATION

FOR: REMEDIAL ACTION WORK PLAN APPENDIX F

PROJECT NO: 500290 | DWG NO: F-4 | REV: 3

File: 500290-001-GY-08-F1_F8.dwg
Plot Date/Time: Nov 02, 2017 - 10:46am
Plotted By: samantha.Bentley

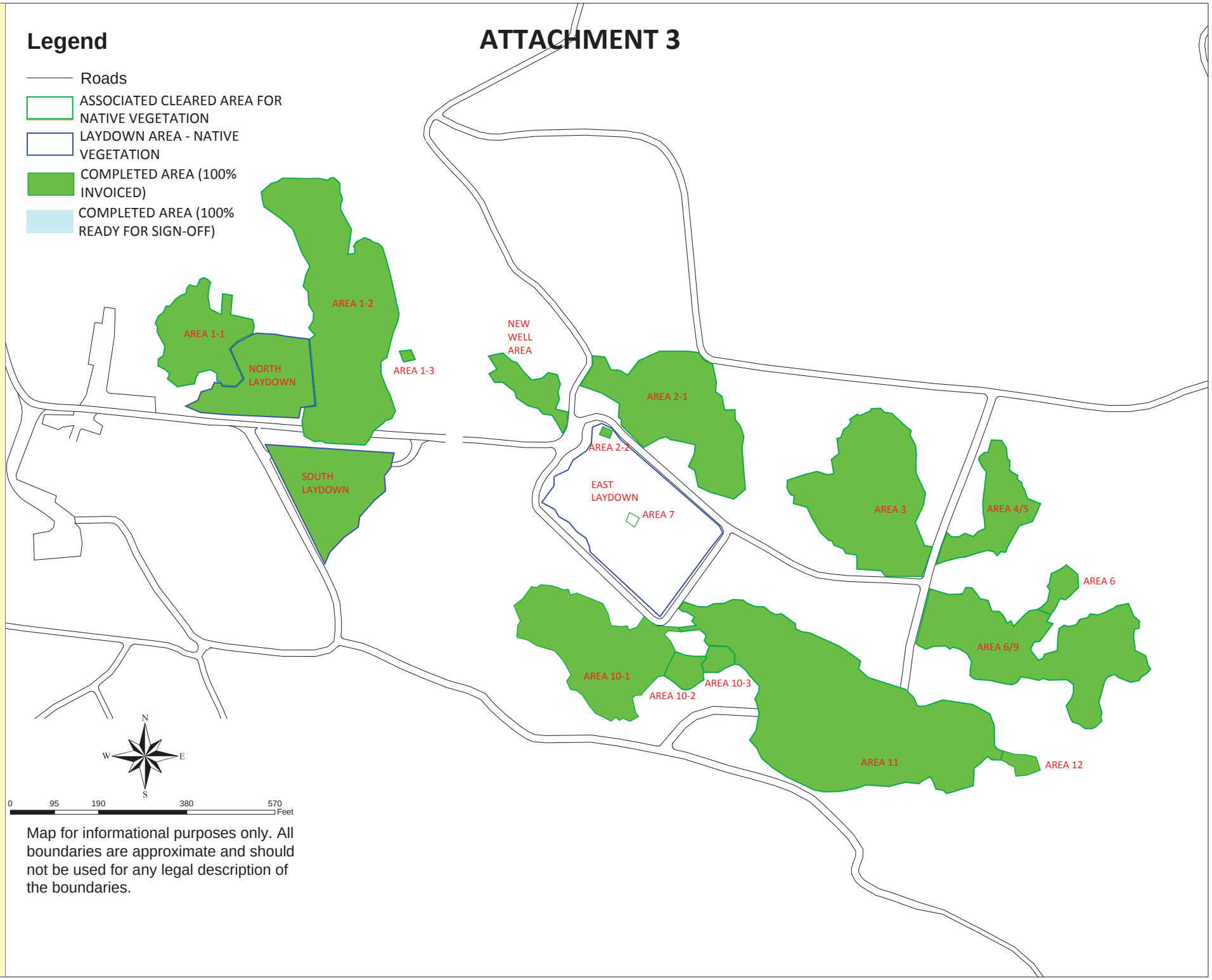
Form: CMS-830-00-FM-02104 CBI ANSI D.dwg

ATTACHMENT 3

Permanent Vegetation Establishment
Ranges near Training Area T-24A

Legend

- Roads
- ASSOCIATED CLEARED AREA FOR NATIVE VEGETATION
- LAYDOWN AREA - NATIVE VEGETATION
- COMPLETED AREA (100% INVOICED)
- COMPLETED AREA (100% READY FOR SIGN-OFF)



Map for informational purposes only. All boundaries are approximate and should not be used for any legal description of the boundaries.

ATTACHMENT 4 - VEGETATION TRACKING

RANGES NEAR TRAINING AREA T-24A

Area	Acreage	% of Total Site Acreage	Permanent Vegetation Date(s)	% Coverage[a]	% Density[b]	Total % Complete	Coverage/Density Notes/Issues
1-1	0.64	3.85%	01/16/17	100%	100%	3.85%	*Complete; Invoiced*
1-2	2.07	12.44%	01/17/17	100%	100%	12.44%	*Complete; Invoiced*
1-3	0.02	0.12%	01/17/17	100%	100%	0.12%	*Complete; Invoiced*
2-1/2-2	1.36	8.17%	01/17/17	100%	100%	8.17%	*Complete; Invoiced*
3	1.59	9.56%	01/17/17	100%	100%	9.56%	*Complete; Invoiced*
4/5	0.49	2.94%	01/17/17	100%	100%	2.94%	*Complete; Invoiced*
6	0.12	0.72%	04/14/17	100%	100%	0.72%	*Complete; Invoiced*
6/9	1.75	10.52%	04/14/17	100%	100%	10.52%	*Complete; Invoiced*
7/ EAST LAYDOWN	1.75	10.52%	01/16/17	95%	100%	0.00%	Keith Westlake/James O'Quinn inspected on 08/08/18. One small area not completely covered with planted/encroaching native vegetation. No action recommended. Expect area to continue filling in after natural reseeding/burn cycle.
10-1	1.28	7.69%	01/17/17	100%	100%	7.69%	*Complete; Invoiced*
10-2	0.14	0.84%	01/17/17	100%	100%	0.84%	*Complete; Invoiced*
10-3	0.08	0.48%	01/17/17	100%	100%	0.48%	*Complete; Invoiced*
11	3.36	20.19%	01/17/17	100%	100%	20.19%	*Complete; Invoiced*
12	0.12	0.72%	01/17/17	100%	100%	0.72%	*Complete; Invoiced*
NORTH LAYDOWN	0.76	4.57%	01/16/17	100%	100%	4.57%	*Complete; Invoiced*
SOUTH LAYDOWN	0.78	4.69%	01/16/17	100%	100%	4.69%	*Complete; Invoiced*
NEW WELL AREA	0.33	1.98%	01/16/17	100%	100%	1.98%	*Complete; Invoiced*
TOTALS	**16.64**	**100.00%**				**89.48%**	

[a] *% Coverage* indicated for areas vegetated with native grass. Requirement is 100% coverage.

[b] *% Density* indicated for areas vegetated with native grass. Requirement is >=85% Density.

ATTACHMENT 5 – PHOTOGRAPHS

T24A - Washout of Original Low Water Crossing

T24A - Washout of Original Low Water Crossing

T24A - Washout of Original Low Water Crossing

T24A - Washout of Original Low Water Crossing

T24A - Inspection of Back Road to Alternate Low Water Crossing

T24A – Inspection of Alternate Location for Low Water Crossing

T24A – Inspection of Alternate Location for LWC

T24A – Clearing Debris from Original LWC

T24A – Clearing Original LWC

T24A – Cleared Original LWC

T24A – Cleared Original LWC

T24A – Placing Barriers at Original LWC

T24A – Barriers at Original LWC

T24A – Clearing and Reinforcing Back Road to Alternate LWC

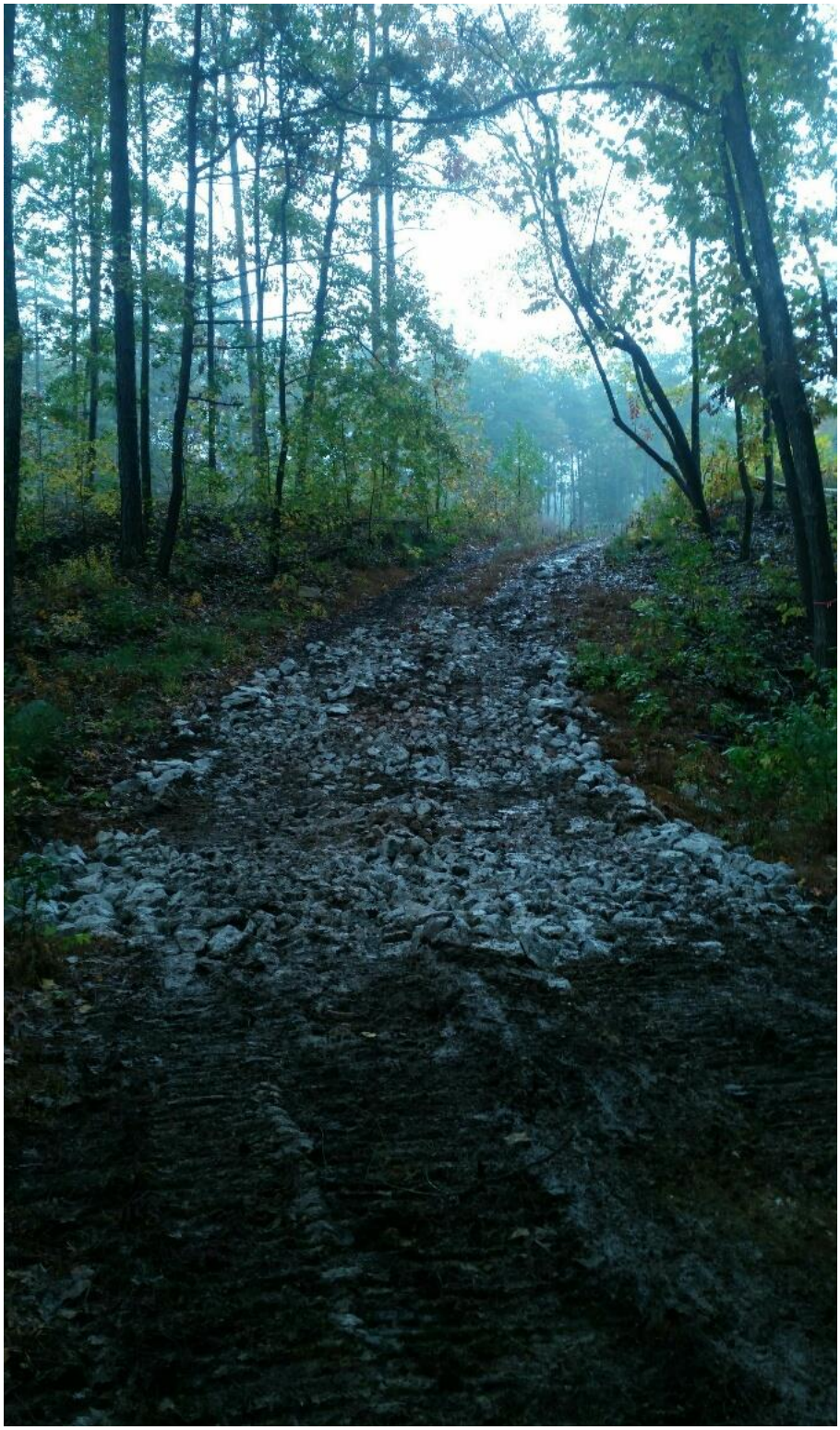
T24A – Clearing and Reinforcing Back Road to Alternate LWC

T24A - Clearing and Reinforcing Back Road to Alternate LWC

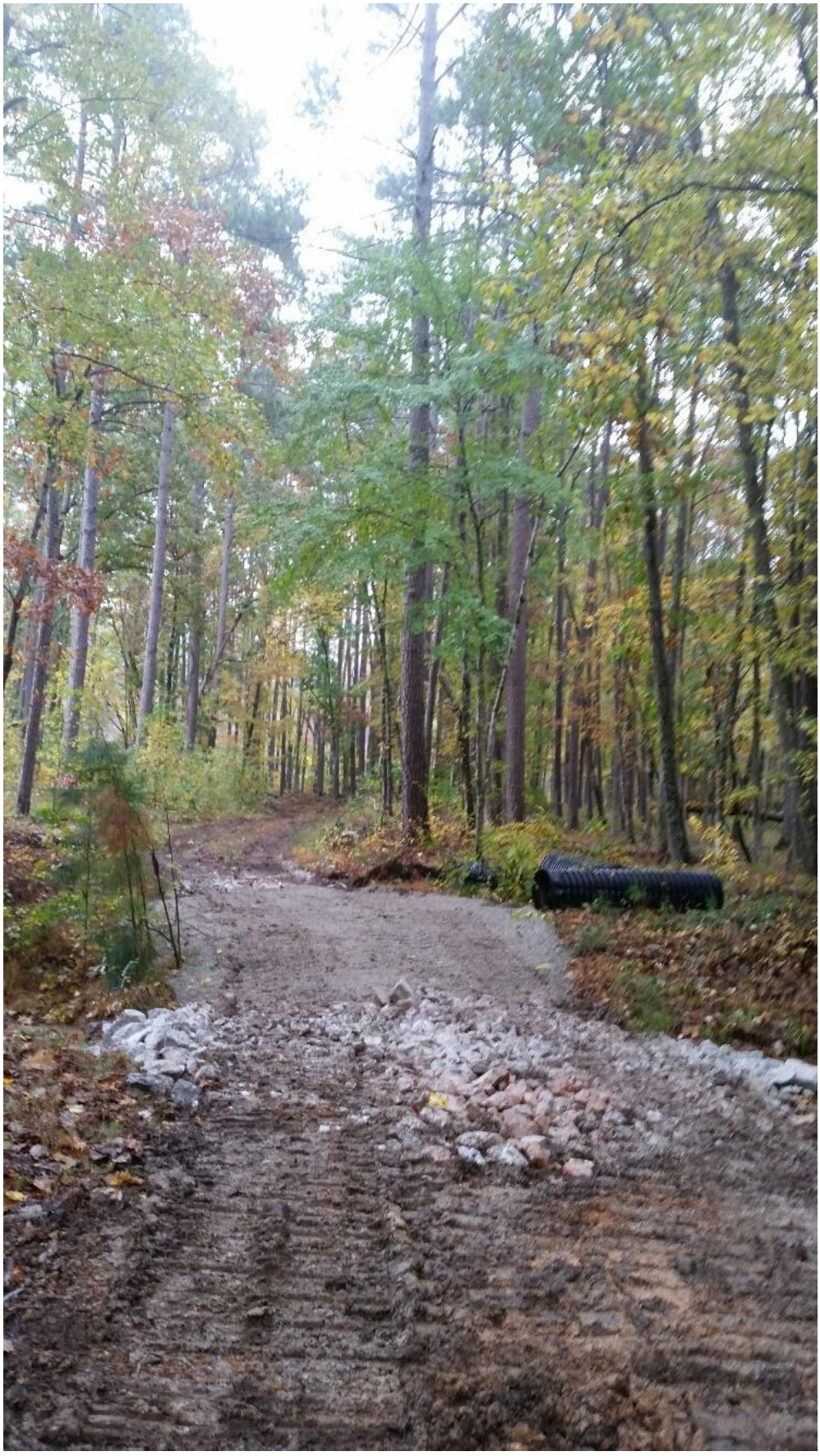
T24A - Clearing and Reinforcing Back Road to Alternate LWC

T24A - Clearing and Reinforcing Back Road to Alternate LWC

T24A - Reinforcing Steep Slope at Area 11 to Alternate LWC

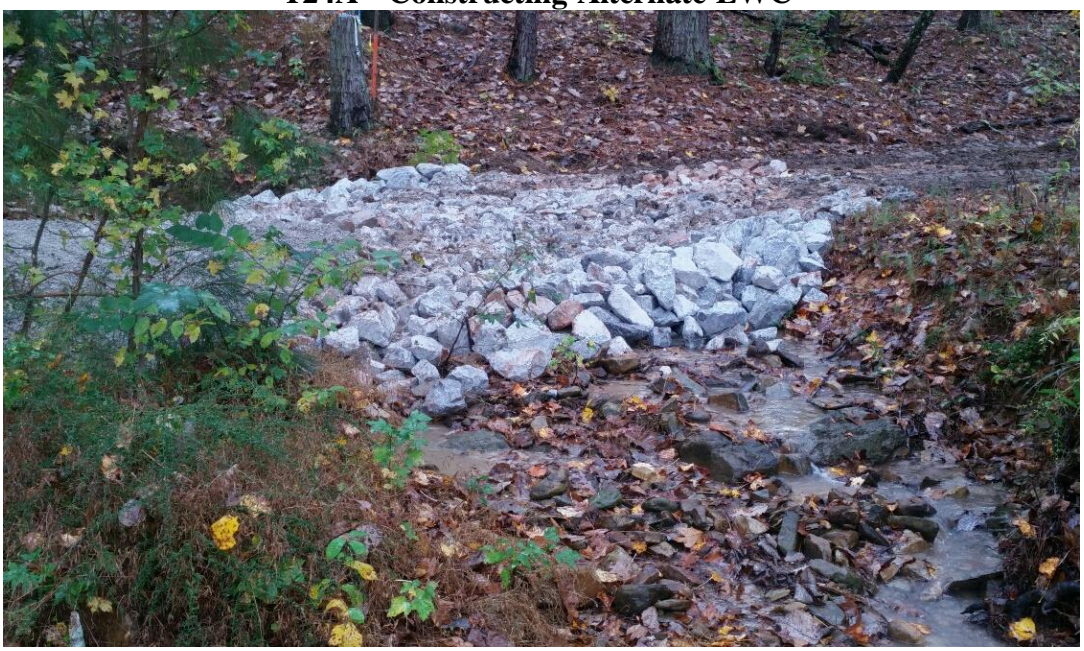


T24A - Reinforcing Steep Slope at Area 11 to Alternate LWC



T24A - Constructing Alternate LWC

T24A - Constructing Alternate LWC



T24A - Alternate LWC