FINAL REPORT

Prepared For

The Colorado Water Conservation Board

January 2018

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

In fulfillment of WSRF Contract POGG1 2015-145

PREWITT RESERVOIR WETLAND PARTNERSHIP

DUCKS UNLIMITED, INC.
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FORT COLLINS, CO 80525

IN COOPERATION WITH:

COLORADO WATER CONSERVATION BOARD
AND
SOUTH PLATTE ROUNDTABLE

Report Submission Date: January 5, 2018 Report Due Date: January 31, 2017 for reporting period September 21, 2013 through December 31, 2017	Prepared by: Martin Grenier Manager of Conservation Programs Ducks Unlimited, Inc.

INTRODUCTION AND BACKGROUND

The goal of the Prewitt Reservoir Wetland Partnership was the enhancement of over 450 acres of wetland habitat associated with Prewitt Reservoir. The Prewitt Partnership included private landowners, Colorado Open Lands, Colorado Parks and Wildlife, Colorado Water Conservation Board, and Ducks Unlimited. The marshes and ponds located along the margins of the reservoir historically provided some of the highest-quality foraging and roosting sites for populations of waterfowl and other migratory birds. These wetlands also provide recreational opportunities for many Coloradoans, including bird watching, fishing, and waterfowl hunting. The activities completed as part of this partnership, will address habitat and recreational needs through the development of passive and active water management on both public and private properties surrounding Prewitt Reservoir. Although some of the area's wetlands are flooded through the normal operation of the reservoir, the installation of water-control structures and suitable excavations, the quality of these areas (or, at least, their persistence) were increased even under normal water management provided by reservoir operators. Similarly, other wetlands in the scope of work were enhanced through active water management which improved both habitat quality and recreational opportunities. Provision of water for wetland wildlife habitat and waterfowl hunting recreation are two important non-consumptive needs identified by the South Platte Basin Roundtable. These important goals were accomplished without any additional diversions on the South Platte River.

OBJECTIVES

This project provides for the attainment of three non-consumptive water supply goals by achieving the following objectives:

1.) The enhancement of existing shallow-water basins associated with Prewitt whose disrupted hydrology has resulted in a shift in plant communities and degradation in habitat quality for wildlife;

2.) The identification of areas marginal to the reservoir that may be enhanced through the careful excavation of material impeding the natural back-flooding of shallow basins providing the best habitats to birds, other wetland wildlife, as well as fish;

3.) The design and installation of small levees placed (sometimes temporarily) on the margins of the reservoir that would serve both to protect existing infrastructure as well as provide additional flooded shallows.

ACREAGE SUMMARY

Table 1. Acreage conserved by the CPW Wetland Wildlife Conservation Program under PO #POGG1 2015-145 through December 31, 2017. All acres have been conserved under this Block Grant.

Task No.	Project No.	Name	Proposal			Delivered			Percent Attained		
			Wetland Acres	Upland Acres	Total Acres	Wetland Acres	Upland Acres	Total Acres	Wetland Acres	Upland Acres	Total Acres
1	CO-222-3	DPG Prewitt	107	0	107	107	0	107	100.00	0	100.00
2	CO-226-3	Prewitt Ranch	210	0	210	150	0	150	71.43	0	71.43
3	CO-251-1	Prewitt SWA	135	0	135	226	0	226	111.11	0	111.11
		Total	**452**	**0**	**452**	**483**	**0**	**483**	**1.07**	**0**	**1.07**

FINANCIAL SUMMARY

Table 2. Financial Summary table for all projects funded by the CPW Wetland Wildlife Conservation Program under PO # POGG1 2015-145 through December 31, 2017. Ducks Unlimited's financial obligations for CO-226-3 Prewitt Ranch were delivered in conjunction with CO-251-1 Prewitt State Wildlife Area projects. Additional activities were completed by the private landowner on Prewitt Ranch and are not reported here.

Task No.	Project No.	Name	Total Project Cost	CWCB Allocation	Match Allocation	CWCB Invoiced to Date	NEW CWCB Expenses Incurred	CWCB Remaining	Federal Match	State Match	Private Match	DU Match	Total Match	Match Yet to Spend	Match %
1	CO-222-3	DPG Prewitt	129,341	16,720	117,767	16,720	0	0	8,713	50,000	25,000	28,908	112,621	5,146	96
2	CO-226-3	Prewitt Ranch	12,420	30,475	97,663	0	0	30,475	166	9,754	2,500	0	12,420	85,243	13
3	CO-251-1	Prewitt SWA	283,028	43,633	58,012	21,778	52,330	21,855	29,000	186,842	22,500	22,908	261,250	-203,238	450
		Total	**424,789**	**90,828**	**273,442**	**38,498**	**52,330**	**52,330**	**37,879**	**246,596**	**50,000**	**51,816**	**386,291**	**-112,849**	**186**

TASK 1: DPG Prewitt Wetland Enhancements

Shallow depression wetland habitats located on DPG Farms property below Prewitt Reservoir were colonized by monotypic stands of robust, emergent vegetation. These homogenous stands of cattail and bulrush have significantly reduced the function of these shallow-water wetlands as habitat for waterfowl and other wetland birds. DU restored 20 acres of wetlands and provided onsite managers the ability to control hydrology and develop preferred wetland plant communities to replace the monotipic vegetation at the site.

The project restored site conditions to those observed early last century. Restoration of shallow water wetlands with heterogeneous emergent plant communities will benefit waterbirds and improve foraging at the site which was extremely limited due to the extent and vigor of cattail and bulrush communities. The project resulted in the reduction of cattail and bulrush biomass resulting in more open wetland habitats with annual plants. By manipulating water-levels and utilizing habitat management techniques (e.g., burning, disking, grazing) to push back ecological succession we were able to increase the availability of mudflats and very shallow water with are beneficial to shorebirds during their spring and fall migrations.

The hydrologic control established by the ditching and installing water-control structure resulted in the quick establishment of vegetation communities preferred by priority waterbirds. The conceptual basis for the restoration activities planned on the site are derived from the cattail management section of USGS' Waterfowl Management Handbook (Fish and Wildlife Leaflet 13.4.13). Moist-soil techniques used to develop the seasonally flooded, emergent wetlands and mudflats are derived from the same source.

Specific project objectives accomplished:

1.) Installation of water-control structures: the installation of four water-control structures allows managers to adjust water levels within the targeted basins so preferred wetland plant communities are established and undesirable plant communities are discouraged. These structures are earthen embankments installed across major drain ditches on the property. They are equipped with inline, Agridrain stoplog structures that allow for efficient management of water supplies and fine-scale manipulation of water levels required to increase foraging efficiencies of the priority waterbird species targeted here.

2.) Phase 1 drainage ditch rehabilitation: 3,277 linear feet of existing drainage ditch was rehabilitated to allows managers to move groundwater out of basins to discourage saturated soil conditions preferred by cattail.

3.) Vegetation treatments: Accessible portions of the 20 acres of wetlands were mowed, disked, and, where appropriate, sprayed to reduce the vigor of these established stands of cattails. Similar treatments on managed sites in the region have shown that these

disturbances are critical to “push” the wetland systems away from the semipermanent plant communities to more functional wetland systems.

Figure 1. Pre-treatment wetland at DPG Prewitt, near Merino, Colorado. Wetland is dominated by monotypic cattails, typical of systems that lack control over hydrology.

Figure 2. Post-treatment wetland at DPG Prewitt, near Merino, Colorado. Cattails in this wetland have been mechanically treated to improve vegetative response from annual plants.

Figure 3. Phase I ditch rehabilitation after completion of the DPG Prewitt project near Merino, Colorado.

Figure 4. One of the Agri Drain stoplog inline water control structures installed at DPG Prewitt project near Merino, Colorado. The structure facilitates management of water levels to promote growth of annual wetland plants and preclude monotypic cattail stands.

Project Completion Date:

The project was completed on April 31, 2016

Project Accomplishments:

Project enhanced 107-acres of shallow water wetlands on private lands.

Project Scope, Problems and Recommended Solutions:

No changes.

TASK 2: Prewitt Ranch

The goal of this project is the enhancement of 210 acres of habitats on Prewitt Reservoir. Over four miles of the southern shore of Prewitt Reservoir maintains shallow-water wetlands used by thousands of waterfowl during the spring and fall migration. During the irrigation season, Prewitt Reservoir is drawn down and wetlands along the margins become vulnerable to degradation. The structures installed by this project will protect habitat most likely to be impacted by changes in the management of water levels in Prewitt Reservoir. The purpose of this project was to identify evaluate different reservoir management strategies and to develop enhancements that will maintain overall habitat quality on private lands along the margins of Prewitt Reservoir.

Project Completion Date:

December 22, 2017

Project Accomplishments:

This project enhanced 150 acres and provided the attainment of habitat goals by achieving the following objectives:

1.) The identification of areas marginal to the reservoir that may be enhanced through the careful excavation of material impeding the natural back-flooding of shallow basins providing the best habitats to birds, other wetland wildlife, as well as fish; Several sand dams were removed or breached to allow shallow water basins to be back-flooded by reservoir waters when at full capacity.

2.) The design and installation of small levees placed (sometimes temporarily) on the margins of the reservoir that would serve both to protect existing infrastructure as well as provide additional flooded shallows.

Figure 5. Construction of small embankment on cell 4 of the Prewitt Ranch and Prewitt State Wildlife Area project near Merino, Colorado. The embankment is designed to hold back water creating shallow water wetlands in portions of the reservoir that are normally dry.

Project Scope, Problems and Recommended Solutions:

Construction of levees was delayed until suitable conditions existed on the reservoir. During 2017, Prewitt Reservoir agreed to delay their fill until the project was completed. At the request of Colorado Parks and Wildlife in 2017, to reduce potential confusion with public, we shifted focus of this restoration to include more acres on Prewitt State Wildlife Area. By shifting the focus, this eliminated potential conflicts over access to State Land Board property under private recreational leases. This reduced enhanced acres for the project from 210 to 150.

TASK 3: Prewitt State Wildlife Area (SWA)

The goal of the Prewitt Reservoir SWA Wetlands Project is the conservation of 135 acres of wetlands. The reservoir's wetlands provide high-quality foraging and roosting sites for waterfowl. We improved habitat and recreation by improving water management in wetlands, which are passively flooded through the current operation of the reservoir. The installation of infrastructure will increase forage quality of these areas for waterfowl, even under normal reservoir operations.

The proposed activities will address habitat and recreational opportunities through the development of passive and active water management on the state-controlled parcels surrounding the reservoir. Many of the area's wetlands are flooded through the normal operation of the reservoir. Typically, the reservoir sees two winter fills with a prolonged drawdown through the summer, depending upon climate and administration of the Platte River. These fills and drawdowns are not performed with the intent to preserve habitat quality of the reservoir's associated wetlands. Therefore, the drawdowns are often asynchronous with the habitat needs of migratory populations of birds, plant communities they depend upon, and waterfowl hunting seasons. By installing water-control structures and carefully planned excavations, the quality of these areas for wetland wildlife was increased to coincide with typical water supplies provided by reservoir operators.

Figure 6. Installation of Agri Drain inline stoplog water control structure for the Prewitt State Wildlife Area wetland enhancement project. This structure enhanced approximately 20 acres of shallow water wetlands.

Figure 7. Installed emergency spillway for the Prewitt State Wildlife Area wetland enhancement project near Merino, Colorado. The spillway is located south of the Agri Drain inline stoplog water control structure, represented by the PVC pipe on the right side of the picture.

Figure 8. Installed Parshall flume below the water control structure for the Prewitt State Wildlife Area wetland enhancement project near Merino, Colorado.

Figure 9. One of the embankments and Agri Drain inline stoplog water control structures installed as part of the Prewitt State Wildlife Reservoir Enhancement Project near Merino, Colorado. The embankment will help retain water during normal operation of the reservoir thereby providing suitable habitat to migratory birds.

Figure 10. Completed embankment for one of the cells at Prewitt State Wildlife Reservoir Enhancement Project near Merino, Colorado. The picture shows the shallow water wetlands that will be exposed under normal drawdowns of the reservoir. This picture was taken following the annual fill of Prewitt Reservoir in late December.

Project Completion Date:

The first part of the project, restoration of wetland north of the reservoir, was completed on June 30, 2016; The second part, installation of embankments and water control structure was completed on December 22, 2017.

Project Accomplishments:

Project enhanced 226-acres of shallow water wetlands on private lands.

Project Scope, Problems and Recommended Solutions:

Construction of levees was delayed until suitable conditions existed on the reservoir. Unusually highwater conditions prevented the delivery of the project until 2017. During 2017, Prewitt Reservoir agreed to delay their fill until the project was completed. At the

request of Colorado Parks and Wildlife in 2017, to reduce potential confusion with public, we shifted focus of this restoration to include more acres on Prewitt State Wildlife Area. By shifting the focus, this eliminated potential conflicts over access to State Land Board property increased recreational opportunities on Prewitt State Wildlife Area. This change increased enhanced acres for the project from 135 to 226.

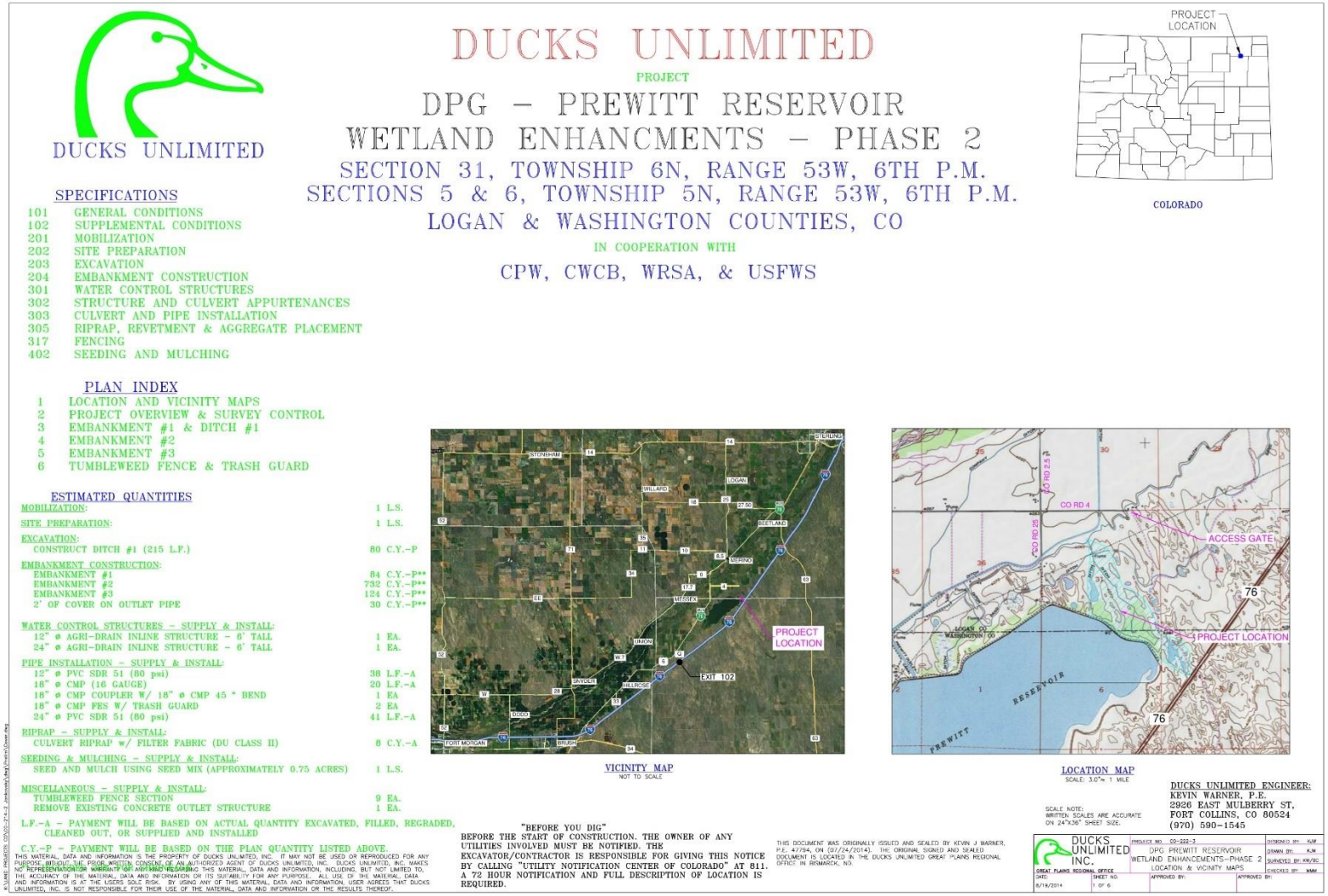

Figure 11. Final design plan set, page 1, for DPG Prewitt (CO-222-3). The project enhanced 107 acres of emergent wetlands near Merino, Colorado.

Figure 12. Final design plan set, page 2, for DPG Prewitt (CO-222-3). The project enhanced 107 acres of emergent wetlands near Merino, Colorado. Plan set depicts location of embankments and water control structures.

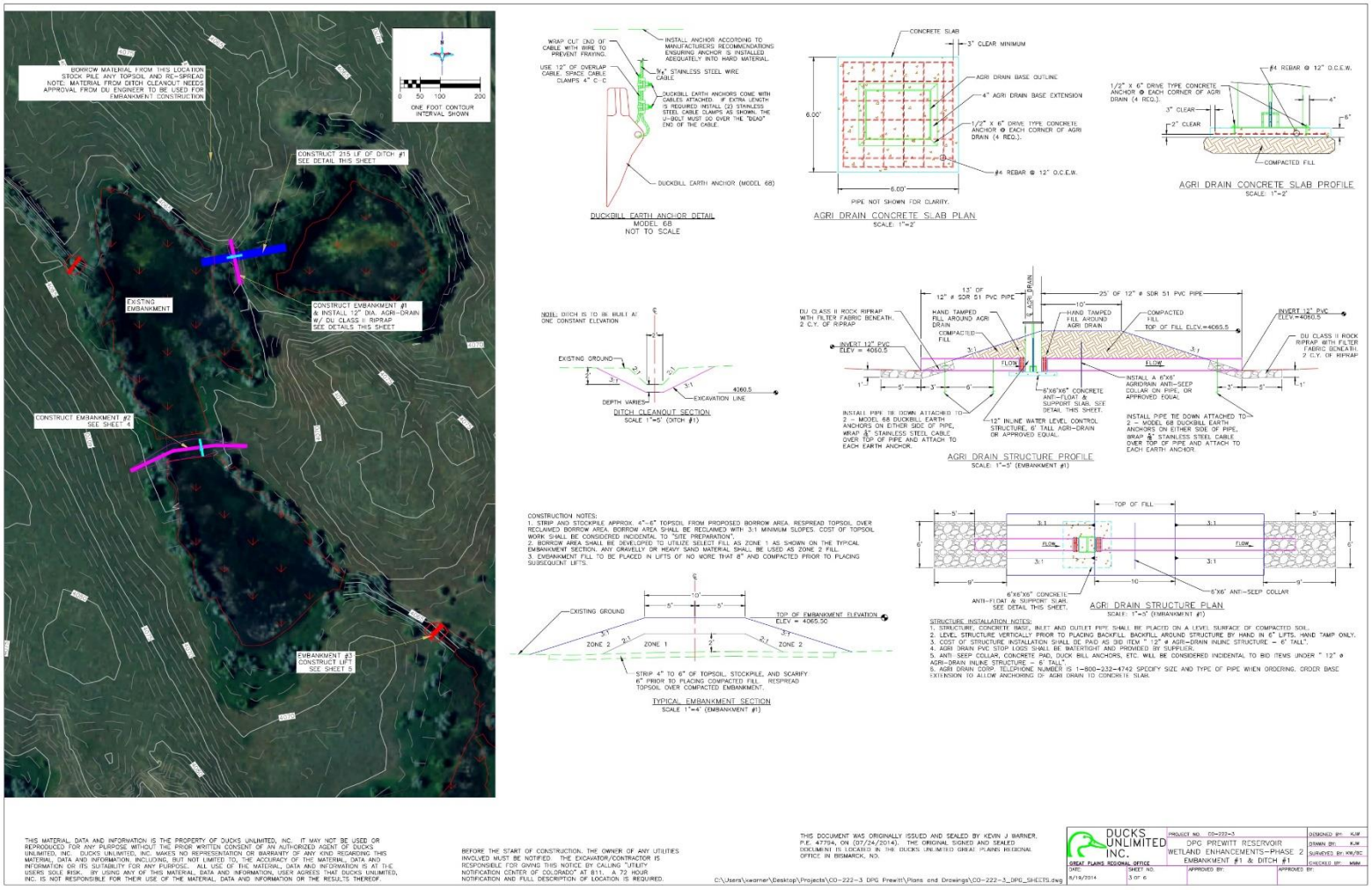

Figure 13. Final design plan set, page 3, for DPG Prewitt (CO-222-3). The project enhanced 107 acres of emergent wetlands near Merino, Colorado. Plan set depicts location of embankments and water control structures.

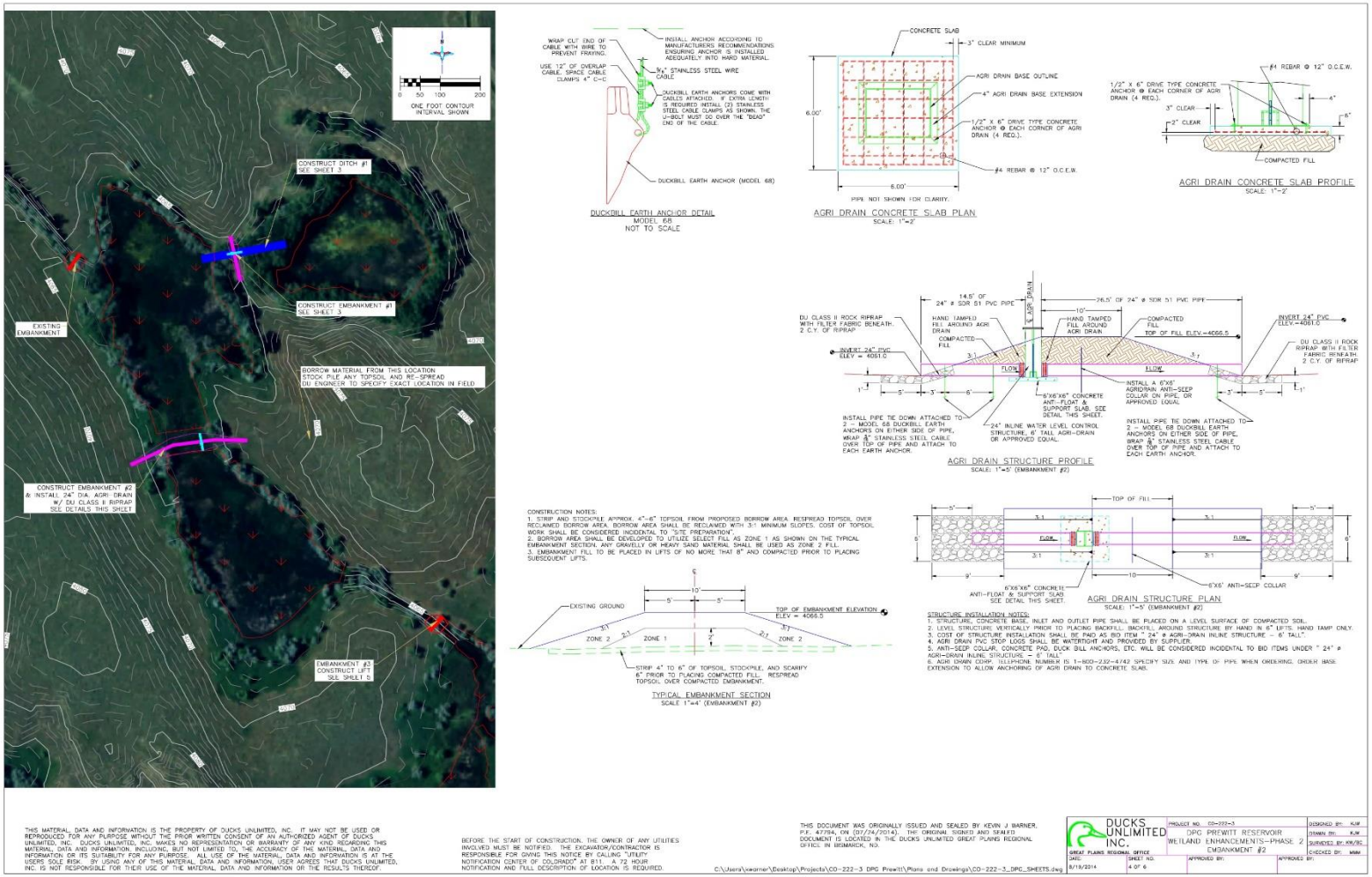

Figure 14. Final design plan set, page 3, for DPG Prewitt (CO-222-3). The project enhanced 107 acres of emergent wetlands near Merino, Colorado. Plan set depicts location of embankments and water control structures.

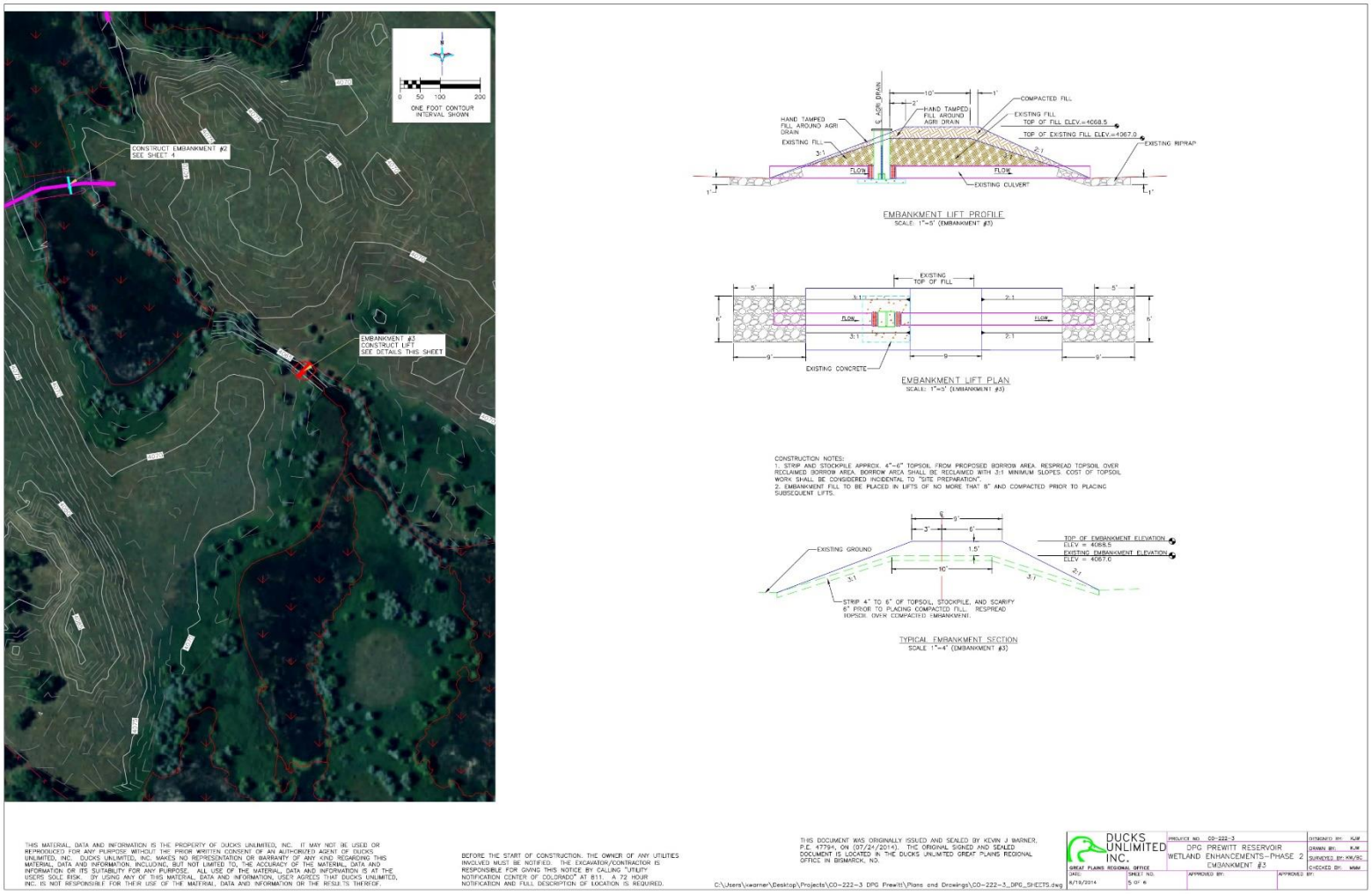

Figure 15. Final design plan set, page 4, for DPG Prewitt (CO-222-3). The project enhanced 107 acres of emergent wetlands near Merino, Colorado. Plan set depicts location of embankments and water control structures.

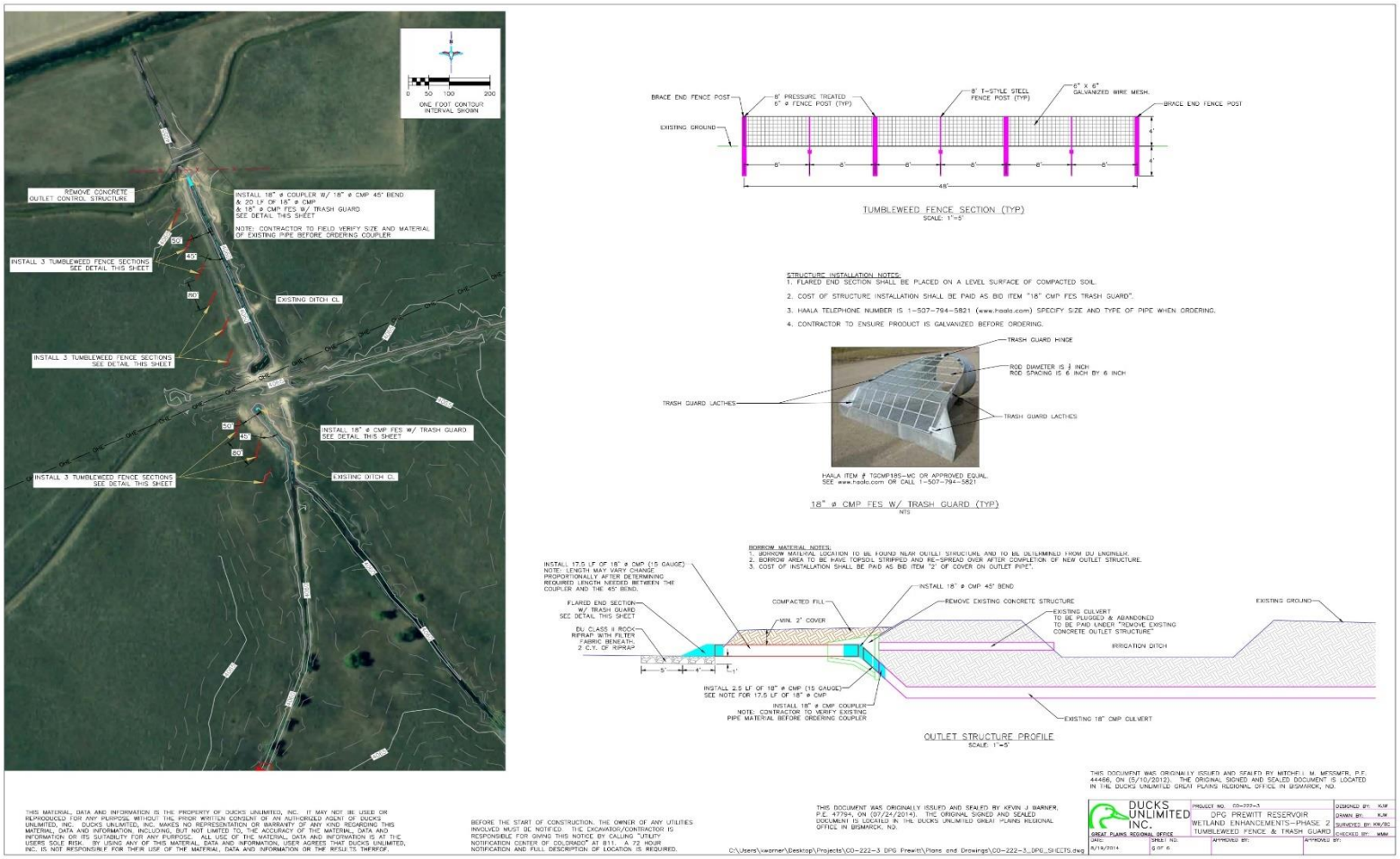

Figure 16. Final design plan set, page 5, for DPG Prewitt (CO-222-3). The project enhanced 107 acres of emergent wetlands near Merino, Colorado. Plan set depicts location of embankments and water control structures.

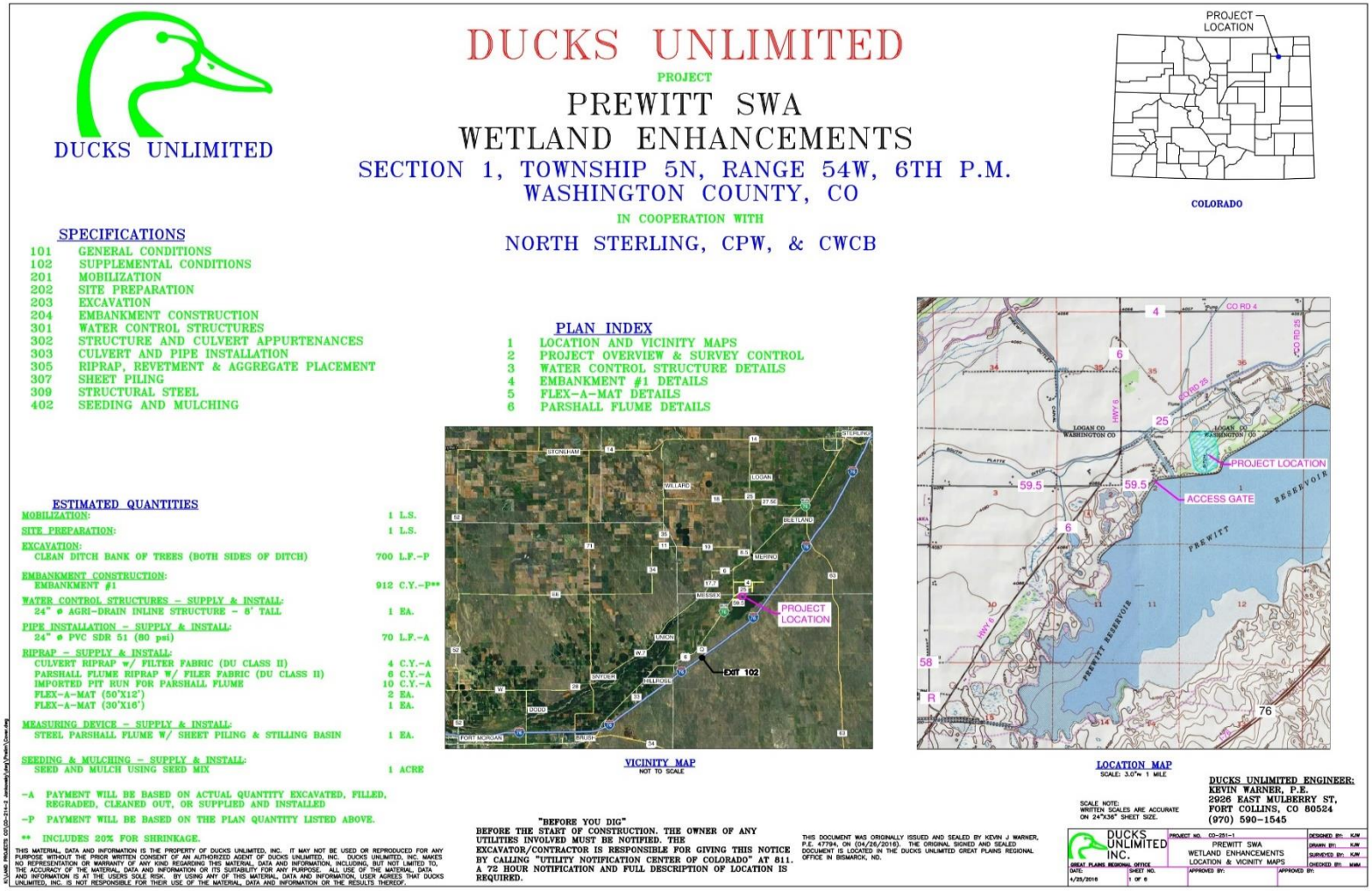

Figure 17. Final design plan set, page 1, for Prewitt State Wildlife Area (CO-251-1). The project enhanced 20 acres of shallow water emergent wetlands near Merino, Colorado.

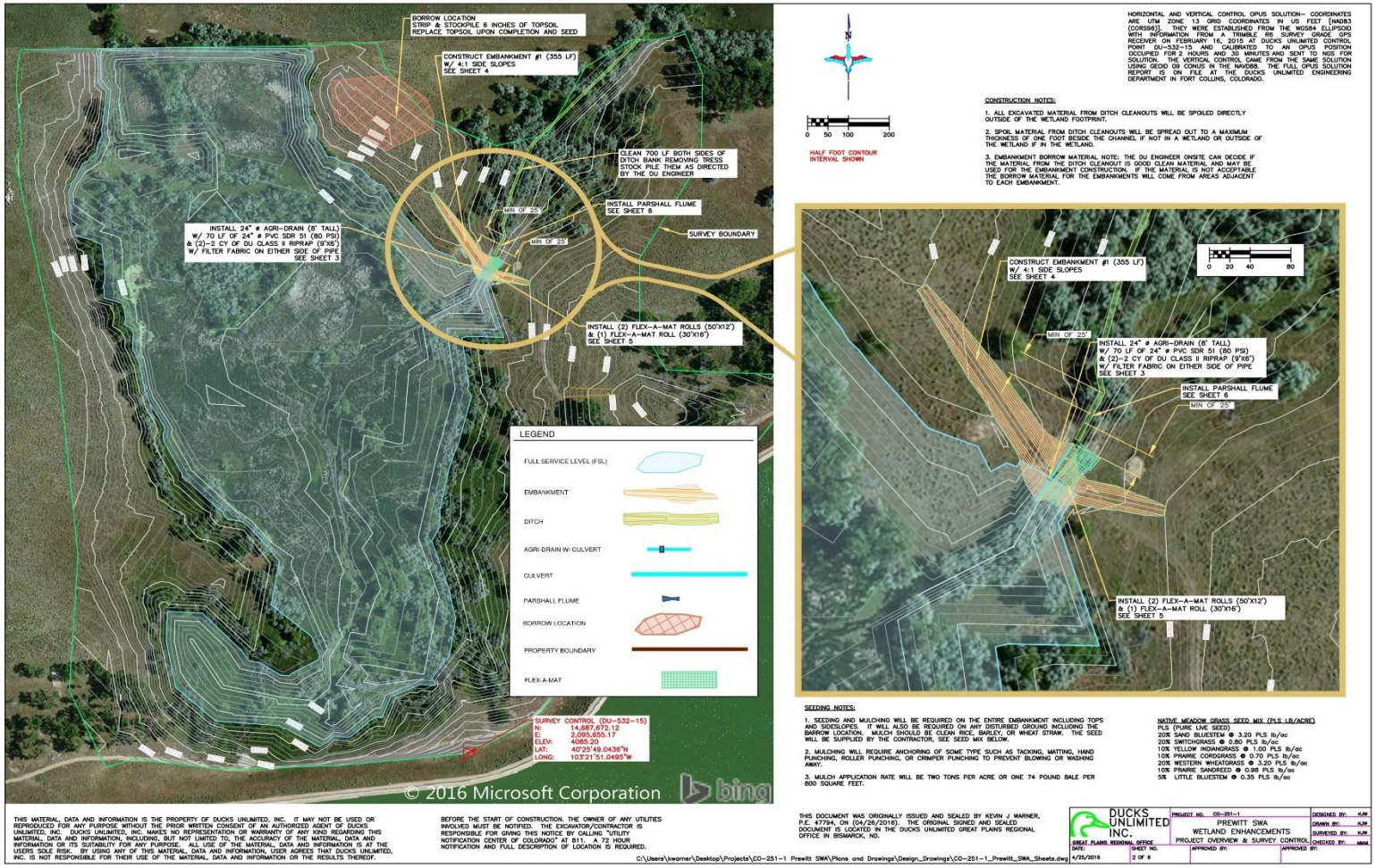

Figure 18. Final design plan set, page 2, for Prewitt State Wildlife Area (CO-251-1). The project enhanced 20 acres of shallow water emergent wetlands near Merino, Colorado. Plan set depicts location of embankments, spillway, and water control structures.

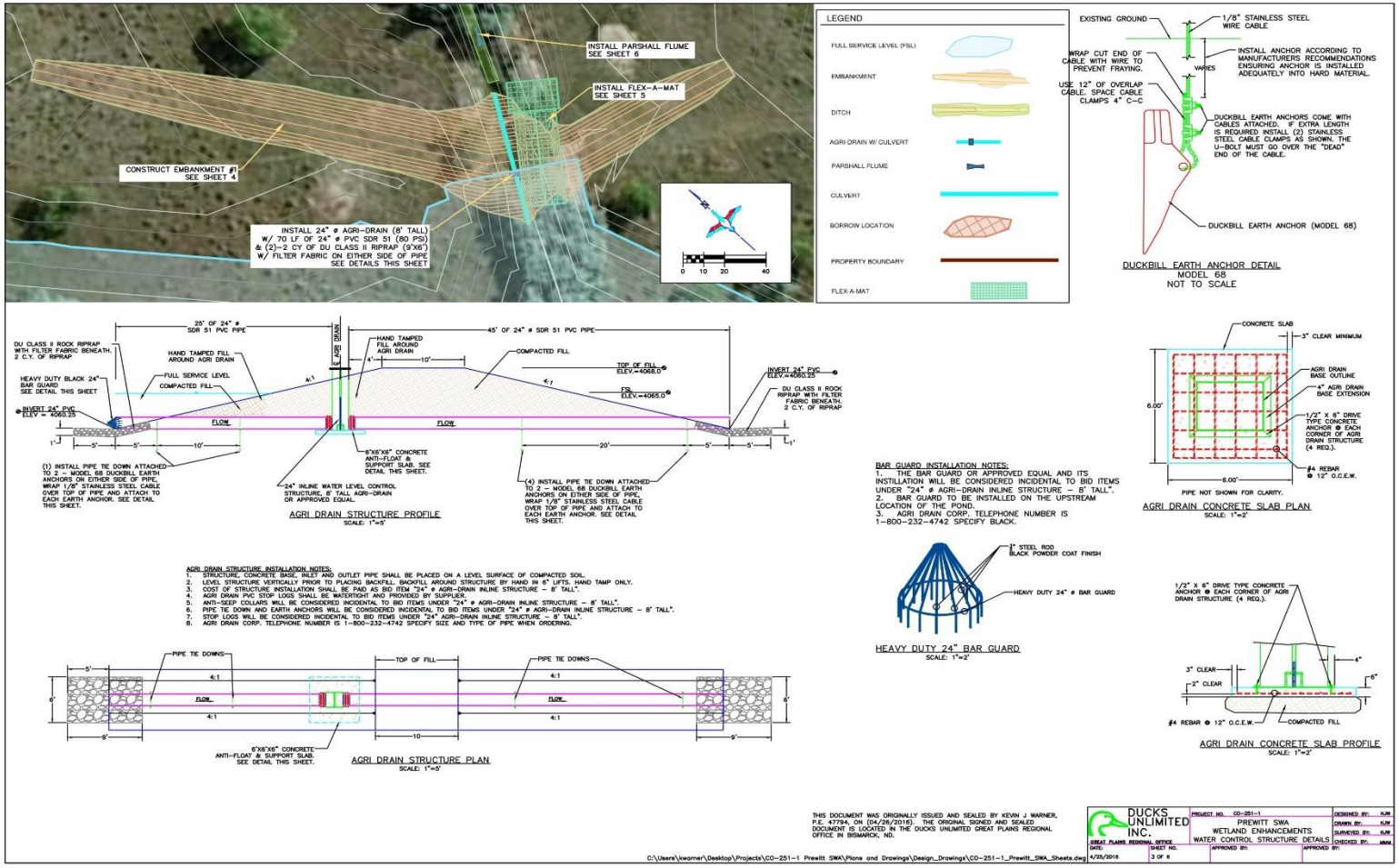

Figure 19. Final design plan set, page 3, for Prewitt State Wildlife Area (CO-251-1). The project enhanced 20 acres of shallow water emergent wetlands near Merino, Colorado. Plan set depicts location of embankments, spillway, and water control structures.

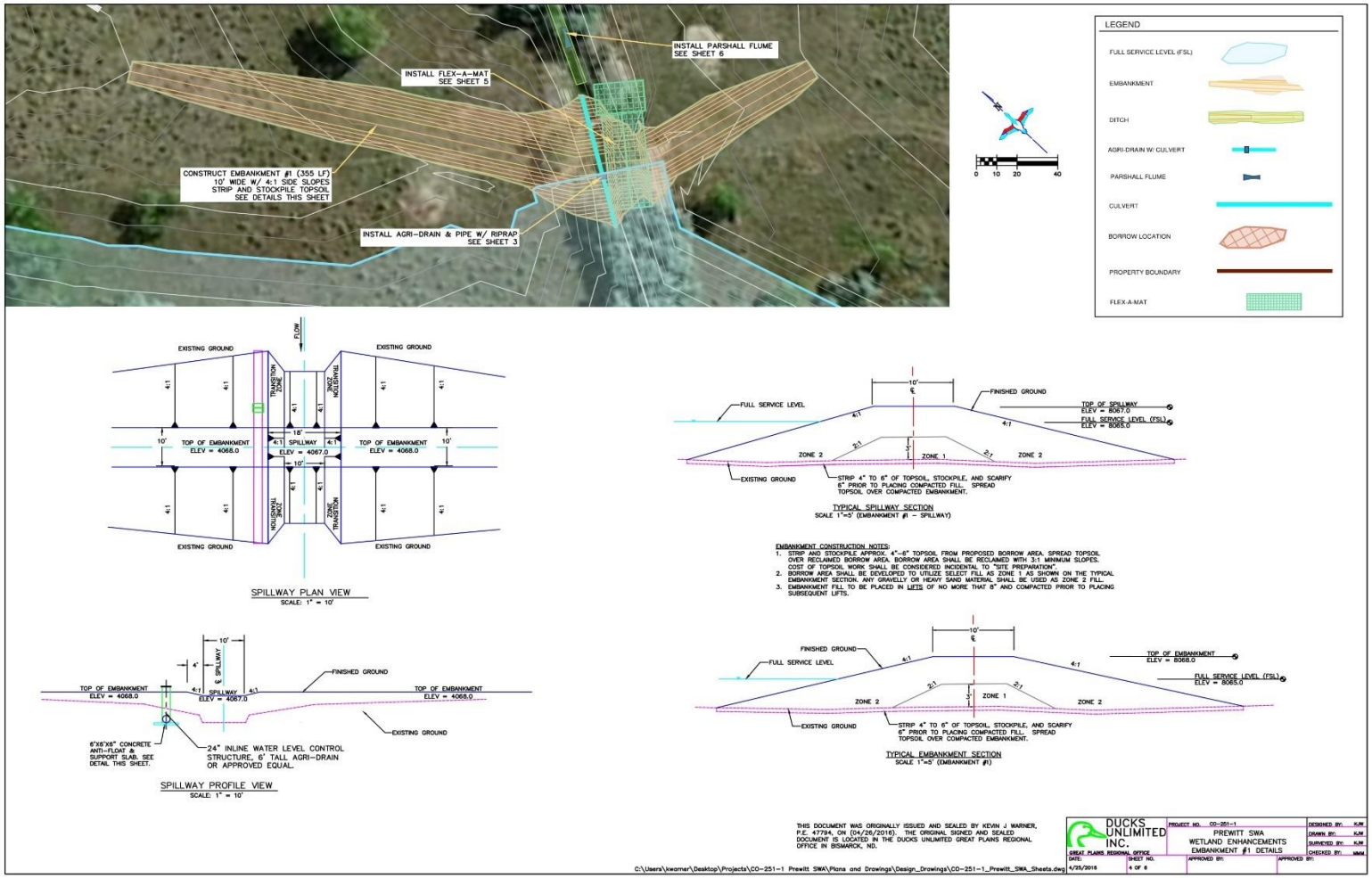

Figure 20. Final design plan set, page 4, for Prewitt State Wildlife Area (CO-251-1). The project enhanced 20 acres of shallow water emergent wetlands near Merino, Colorado. Plan set depicts location of embankments, spillway, and water control structures.

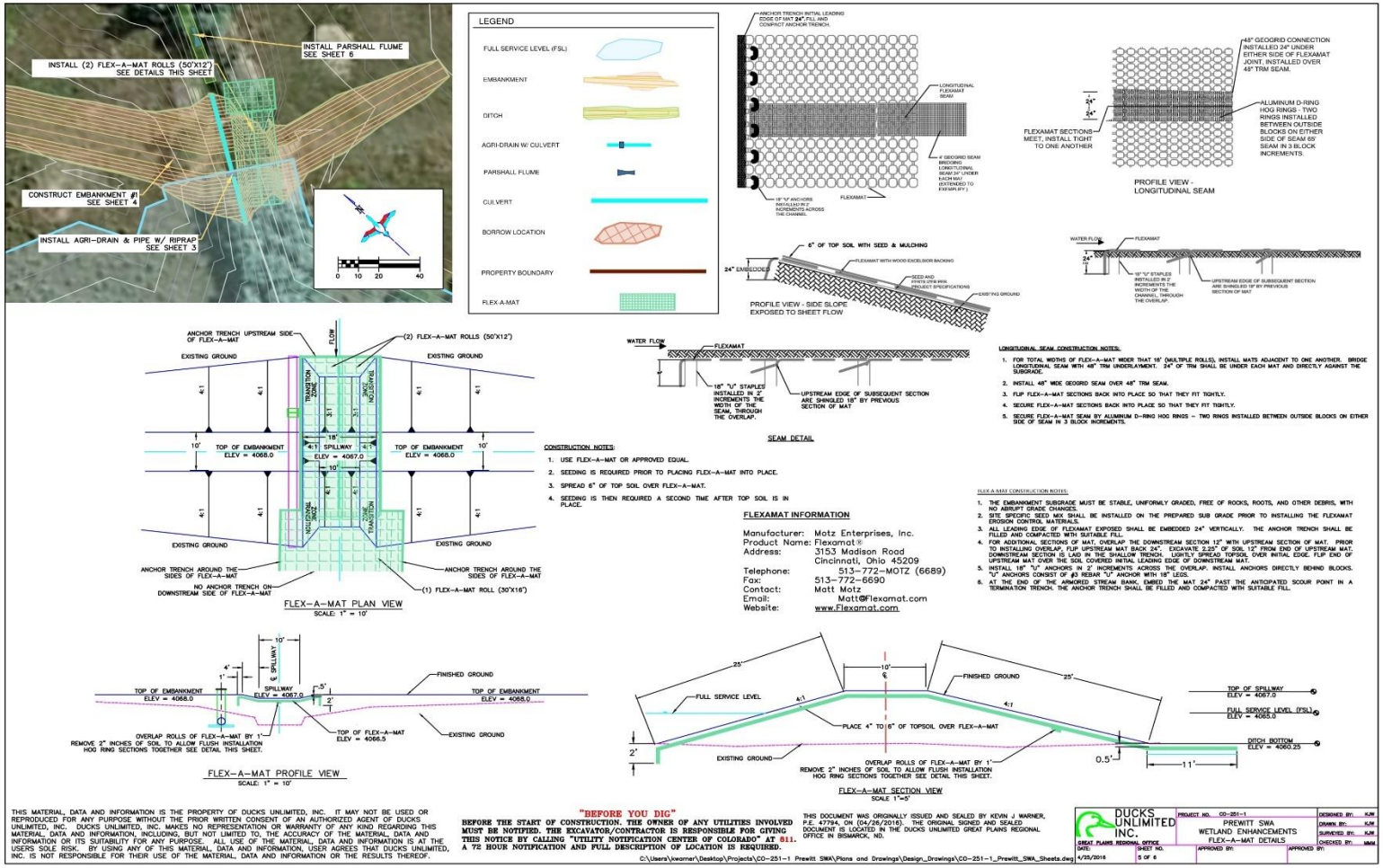

Figure 21. Final design plan set, page 5, for Prewitt State Wildlife Area (CO-251-1). The project enhanced 20 acres of shallow water emergent wetlands near Merino, Colorado. Plan set depicts location of embankments, spillway, and water control structures.

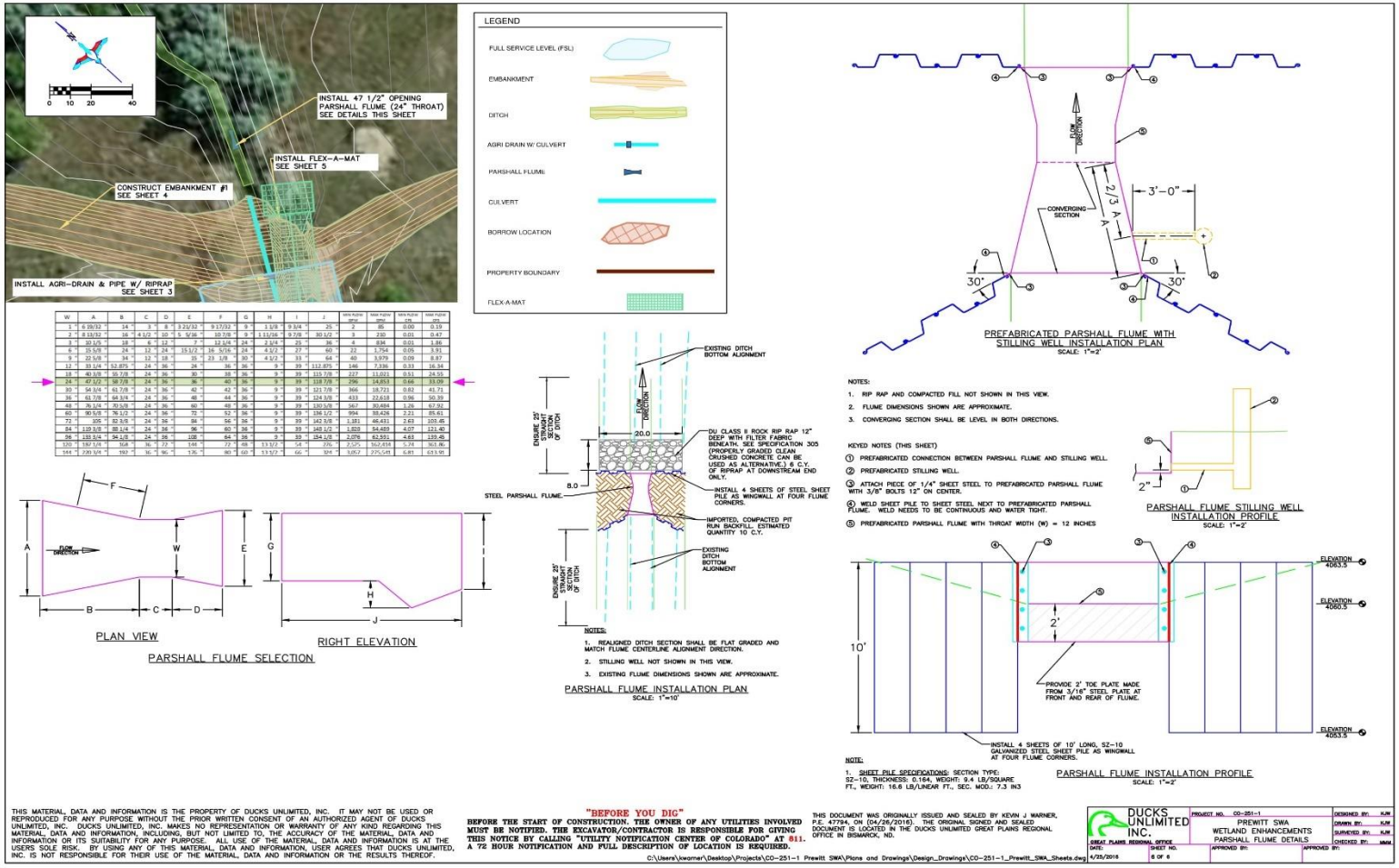

Figure 22. Final design plan set, page 6, for Prewitt State Wildlife Area (CO-251-1). The project enhanced 20 acres of shallow water emergent wetlands near Merino, Colorado. Plan set depicts location of embankments, spillway, and water control structures.

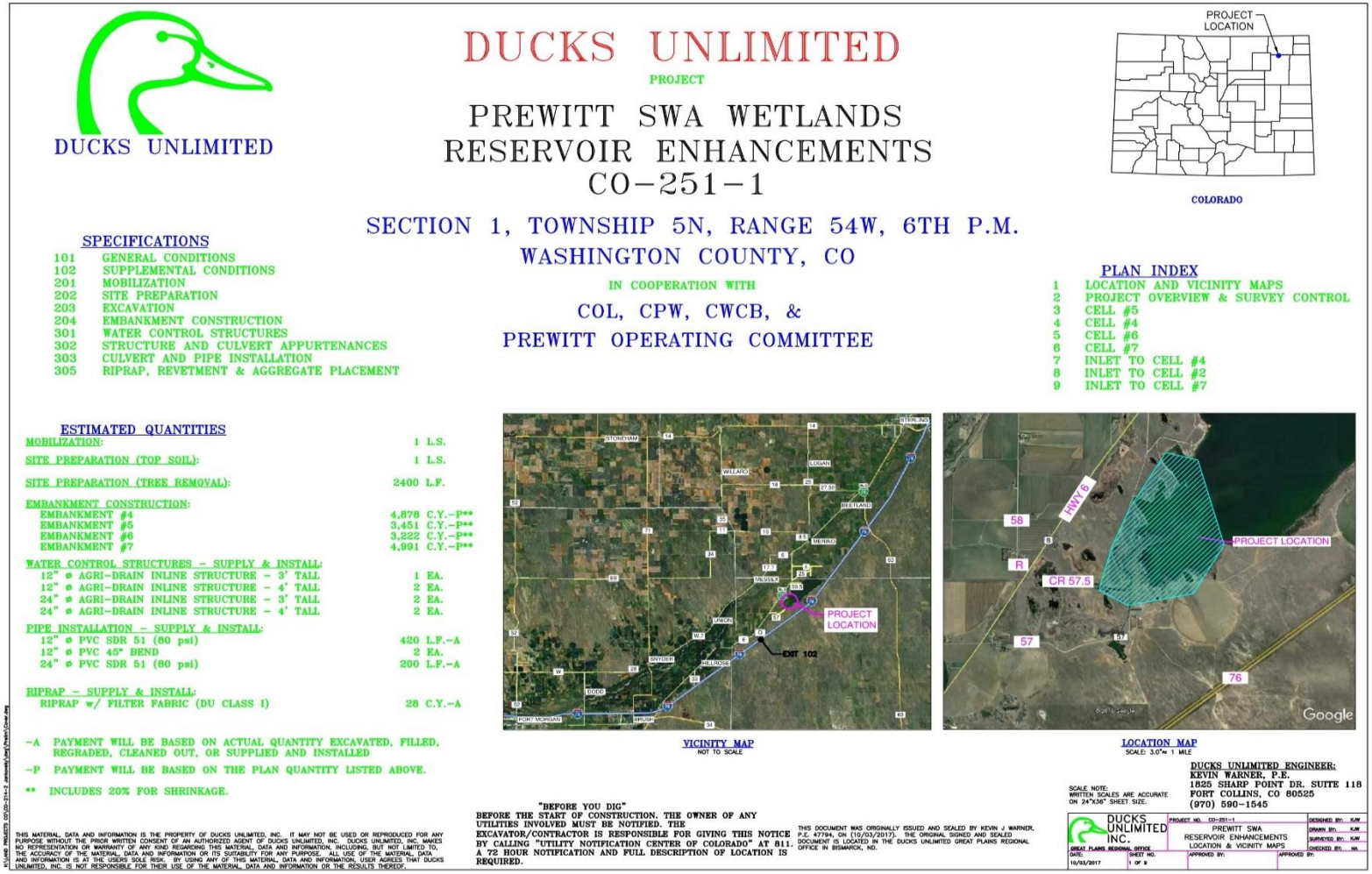

Figure 23. Final design plan set, page 1, for Prewitt State Wildlife Area Reservoir Enhancements (CO-251-1). The project enhanced 206 acres of shallow water emergent wetlands on the reservoir near Merino, Colorado.

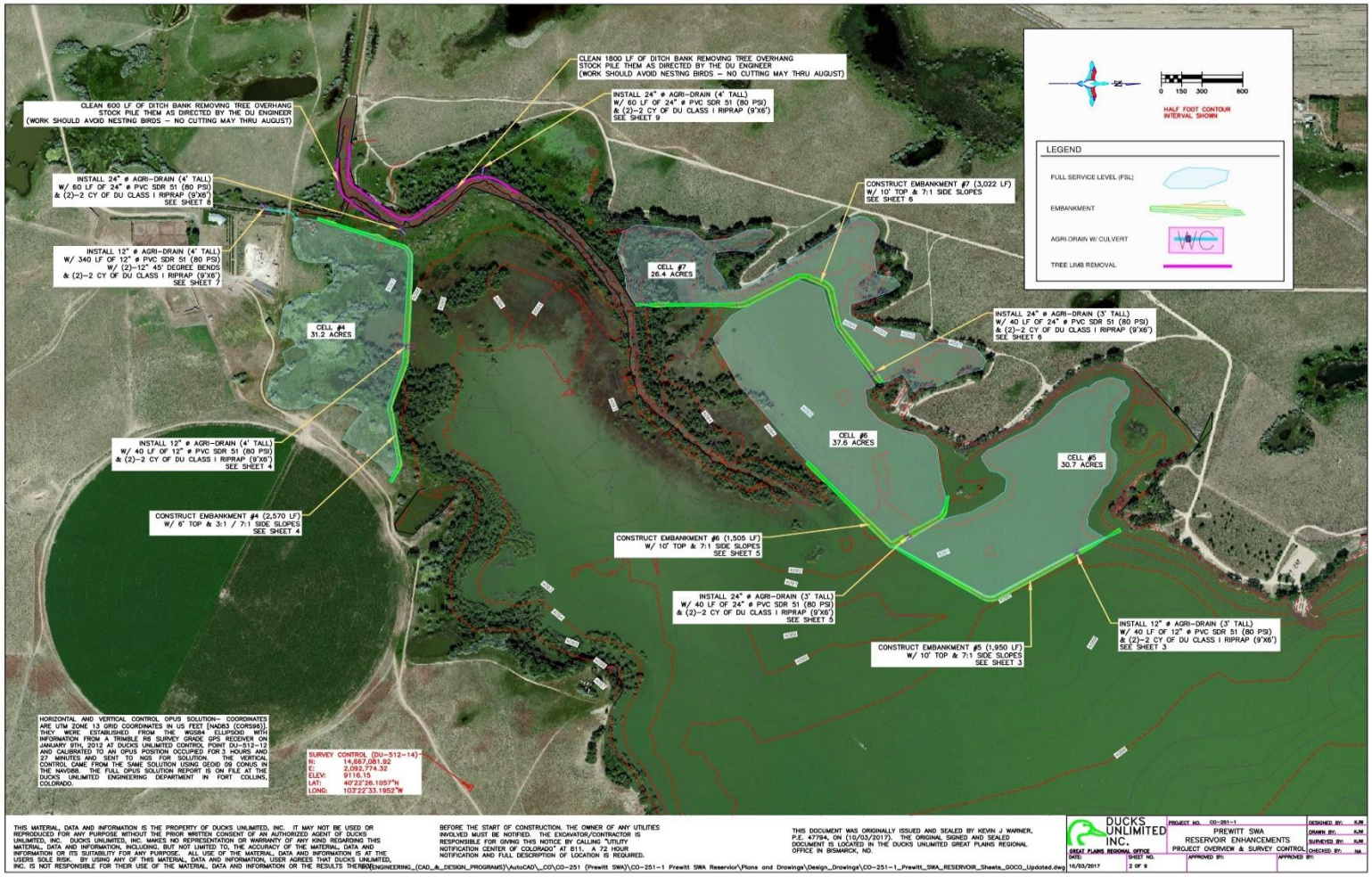

Figure 24. Final design plan set, page 2, for Prewitt State Wildlife Area Reservoir Enhancements (CO-251-1). The project enhanced 206 acres of shallow water emergent wetlands on the reservoir near Merino, Colorado. Plan set depicts location of embankments and water control structures.

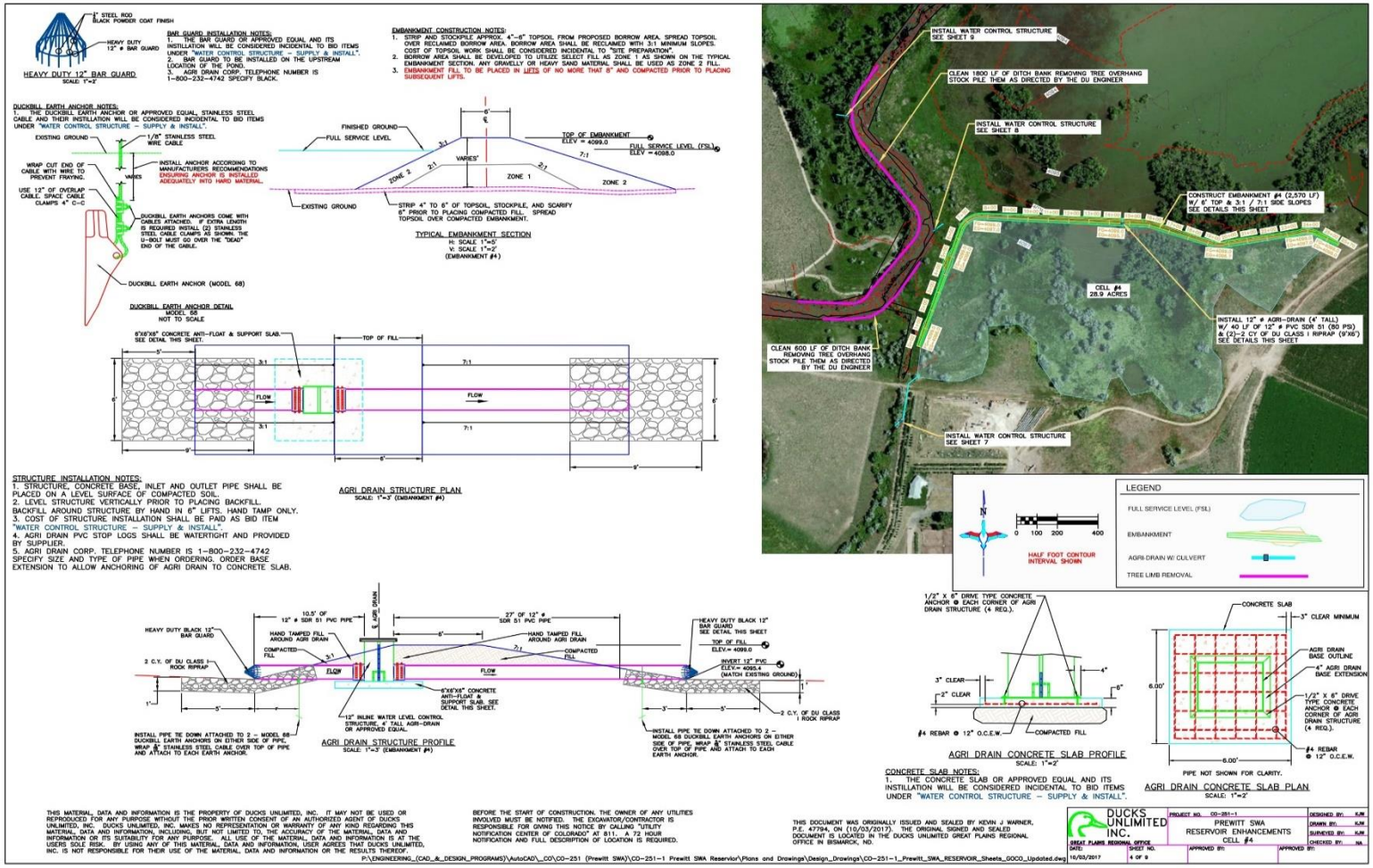

Figure 25. Final design plan set, page 3, for Prewitt State Wildlife Area Reservoir Enhancements (CO-251-1). The project enhanced 206 acres of shallow water emergent wetlands on the reservoir near Merino, Colorado. Plan set depicts location of embankments and water control structures.

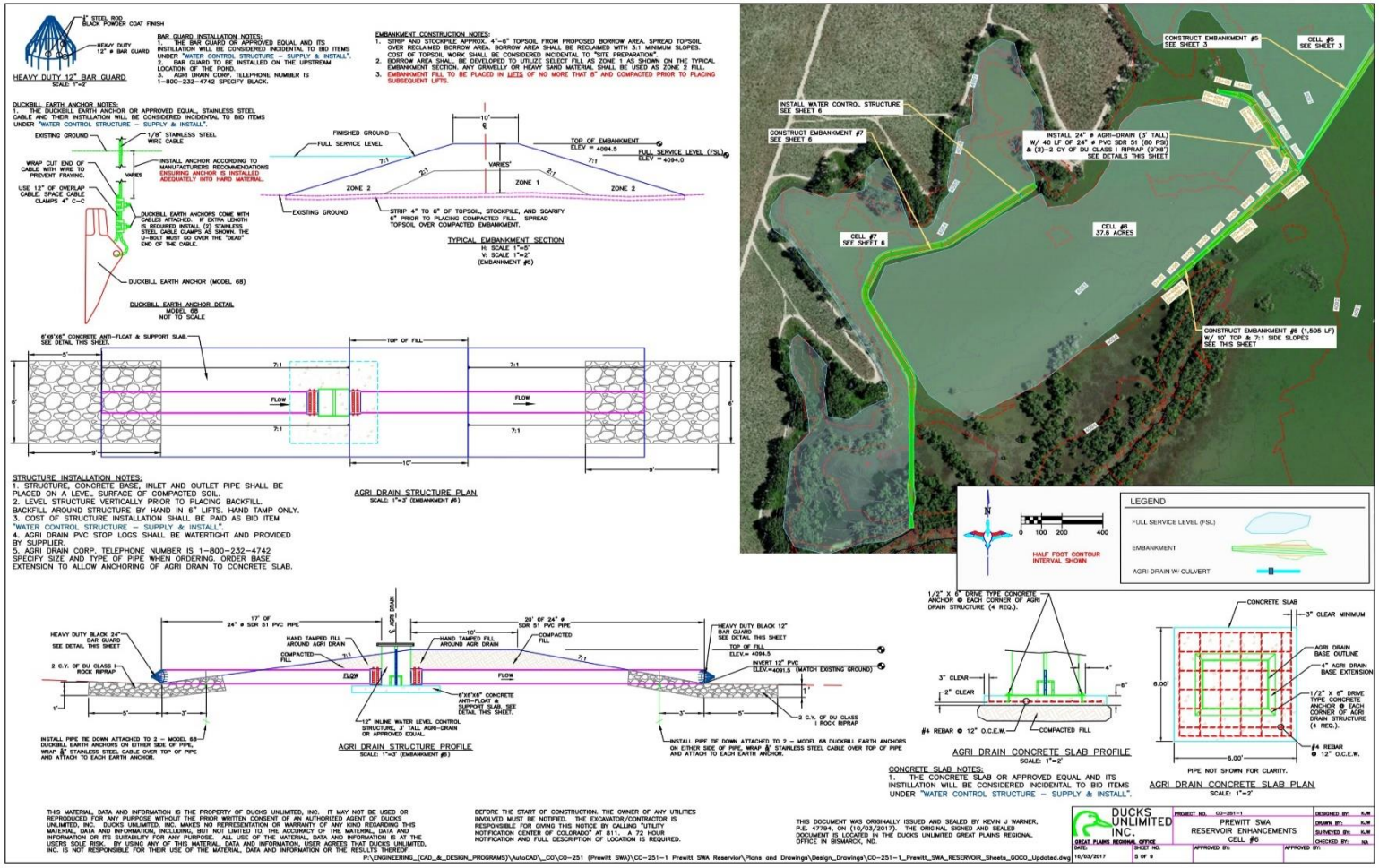

Figure 26. Final design plan set, page 4, for Prewitt State Wildlife Area Reservoir Enhancements (CO-251-1). The project enhanced 206 acres of shallow water emergent wetlands on the reservoir near Merino, Colorado. Plan set depicts location of embankments and water control structures.

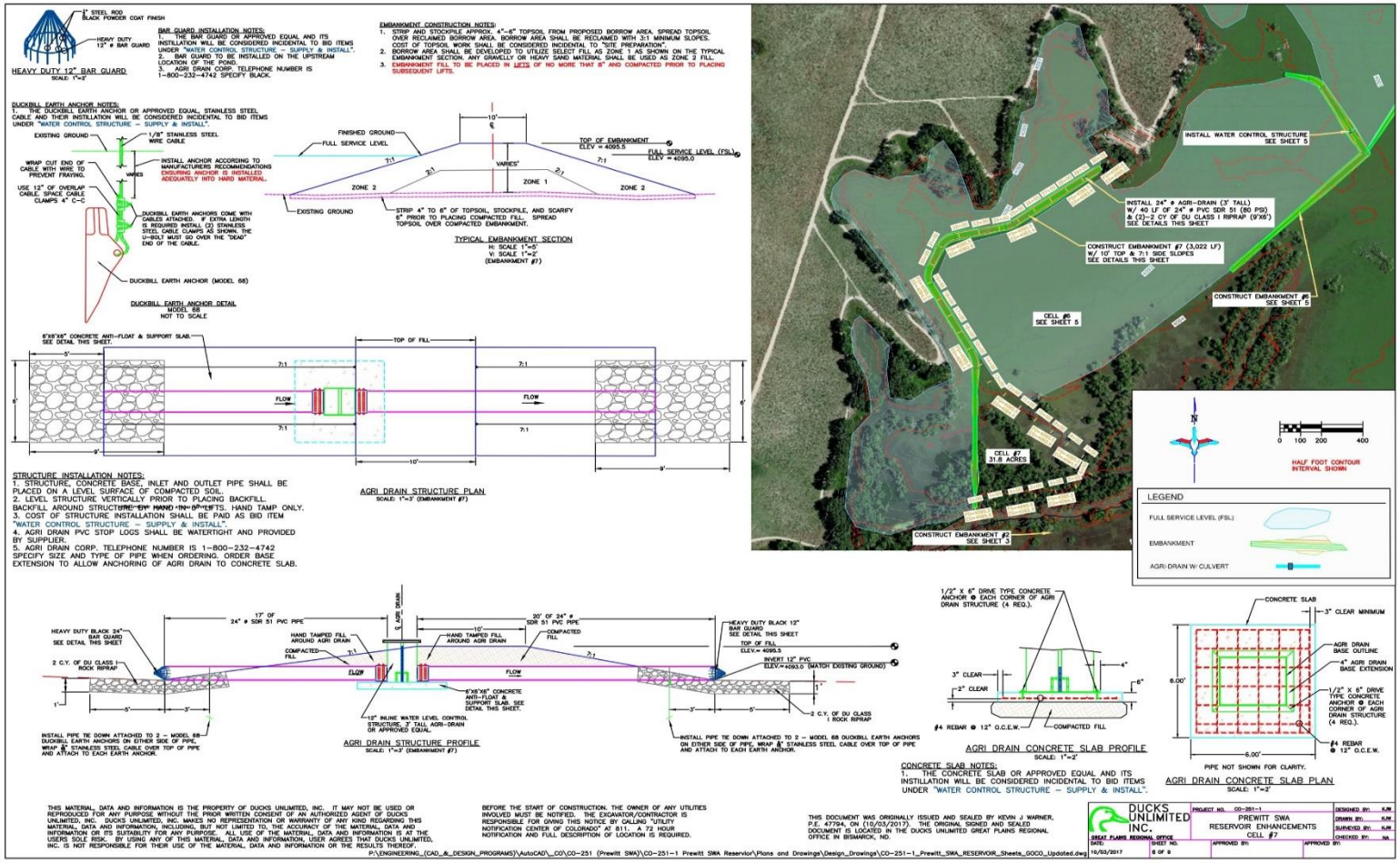

Figure 27. Final design plan set, page 5, for Prewitt State Wildlife Area Reservoir Enhancements (CO-251-1). The project enhanced 206 acres of shallow water emergent wetlands on the reservoir near Merino, Colorado. Plan set depicts location of embankments and water control structures.

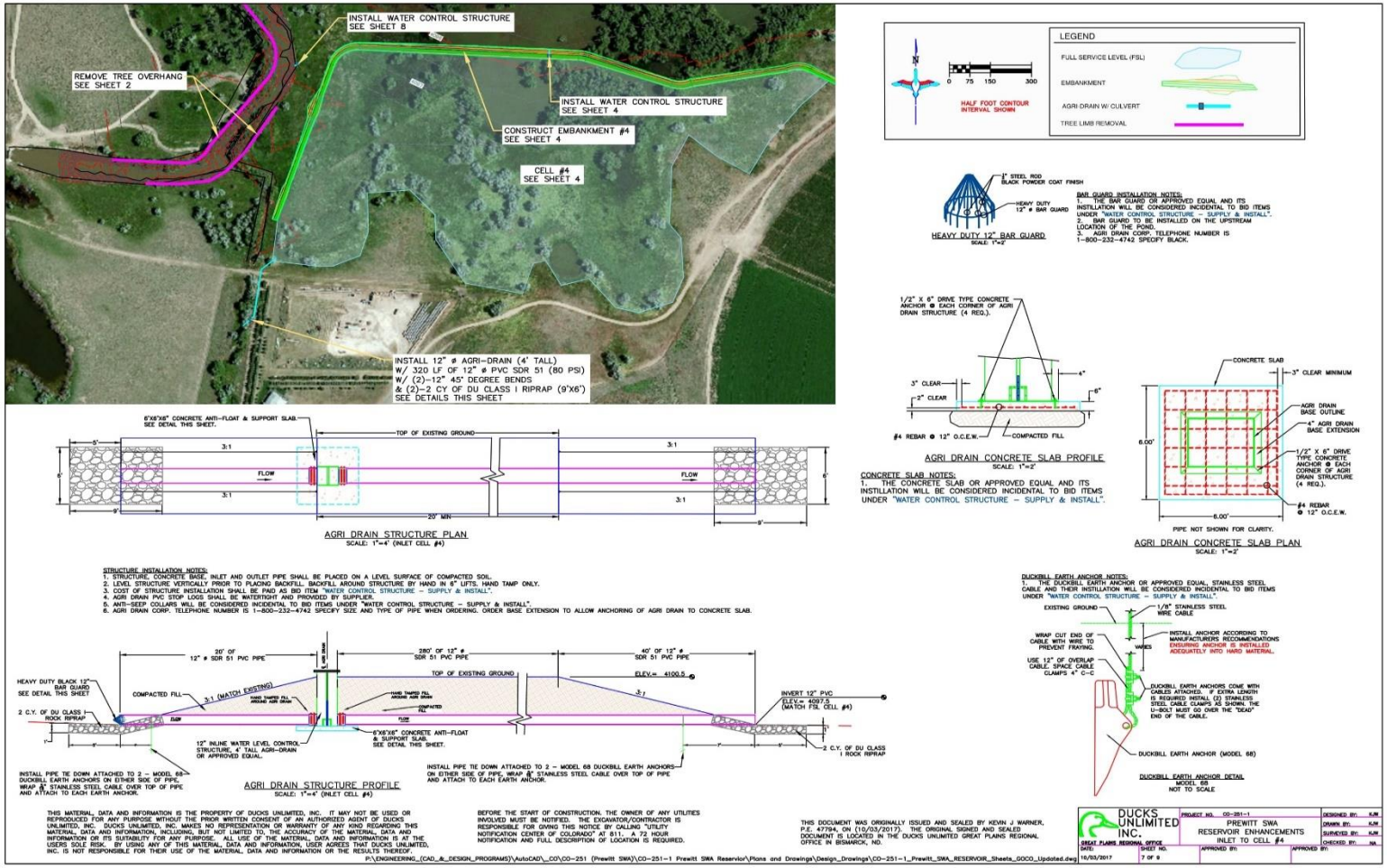

Figure 28. Final design plan set, page 6, for Prewitt State Wildlife Area Reservoir Enhancements (CO-251-1). The project enhanced 206 acres of shallow water emergent wetlands on the reservoir near Merino, Colorado. Plan set depicts location of embankments and water control structures.

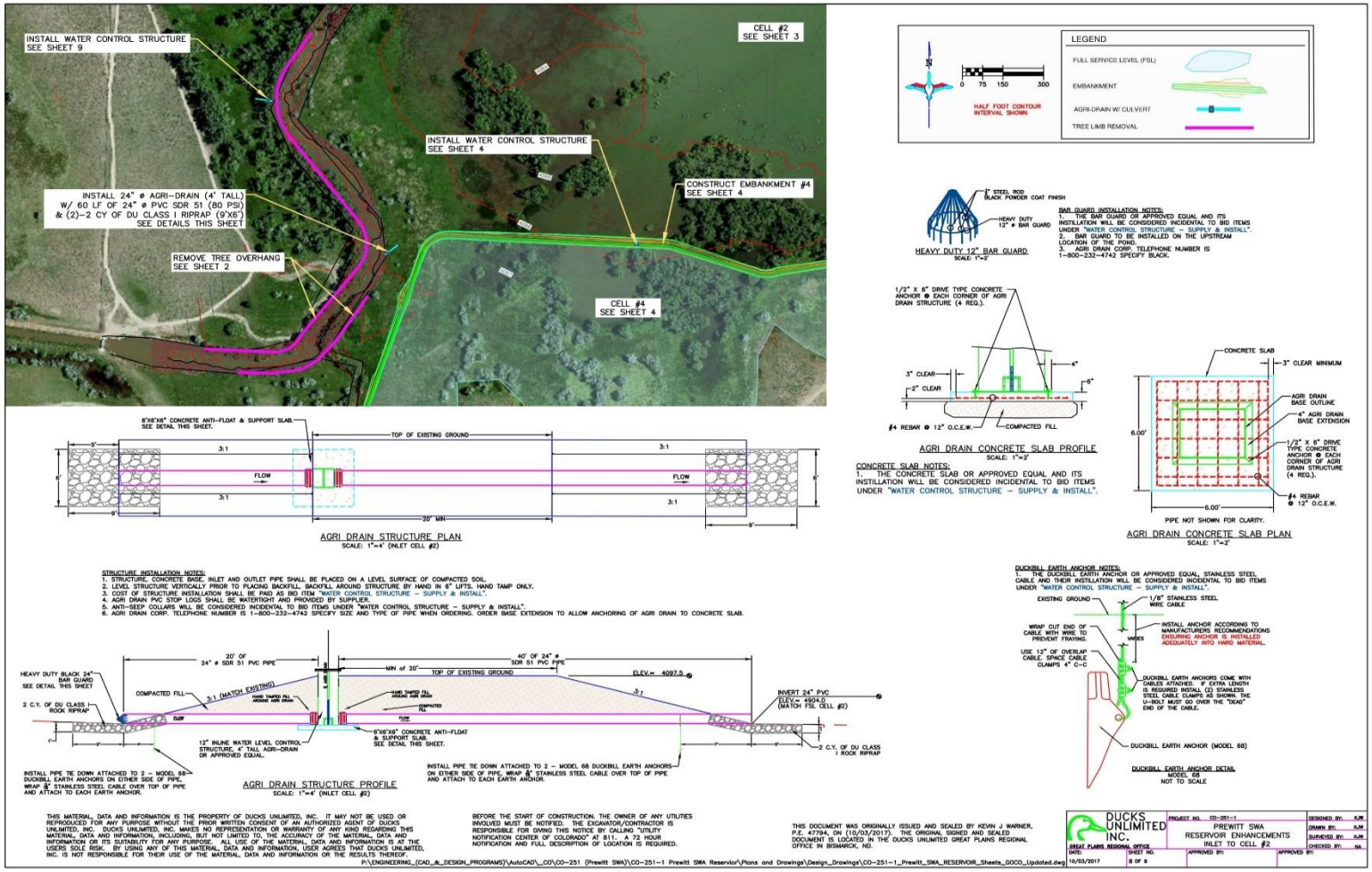

Figure 29. Final design plan set, page 7, for Prewitt State Wildlife Area Reservoir Enhancements (CO-251-1). The project enhanced 206 acres of shallow water emergent wetlands on the reservoir near Merino, Colorado. Plan set depicts location of embankments and water control structures.

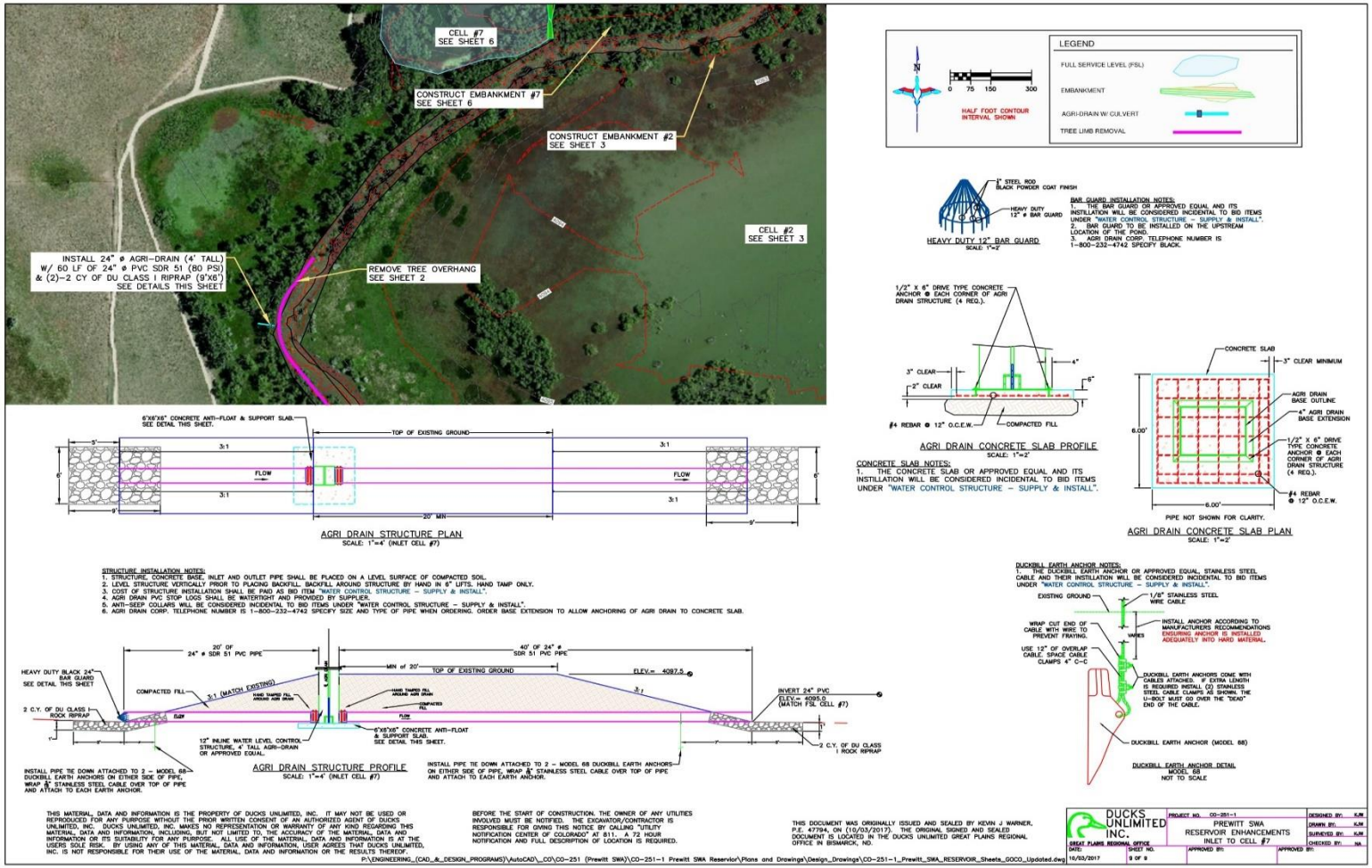

Figure 30. Final design plan set, page 8, for Prewitt State Wildlife Area Reservoir Enhancements (CO-251-1). The project enhanced 206 acres of shallow water emergent wetlands on the reservoir near Merino, Colorado. Plan set depicts location of embankments and water control structures.

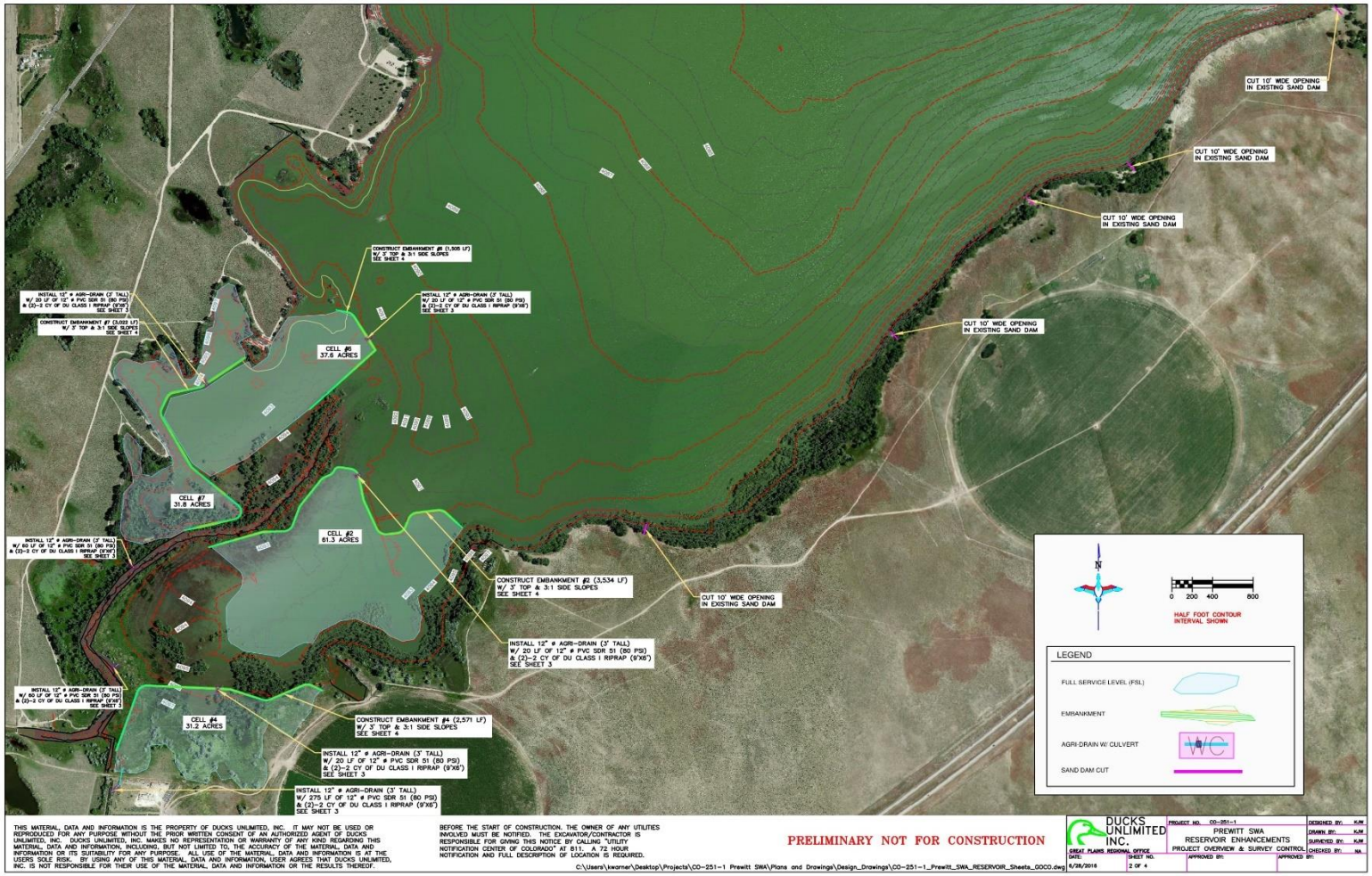

Figure 31. Final design plan set Prewitt Ranch Enhancements (CO-226-3), includes some portion of the Prewitt State Wildlife Area Reservoir Enhancement. The project Prewitt SWA Reservoir enhanced 206 acres of shallow water emergent wetlands on the reservoir while the Prewitt Ranch project enhanced 150 acres near Merino, Colorado. Prewitt Ranch was delivered by the broader Prewitt Partnership on private lands. Prewitt Ranch Enhancements plan set depicts location of embankments, water control structures, and sad dam cuts on private lands that enhanced wetlands on the margins of the reservoir.