Appendix K
Mitigation Plan

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This appendix includes updated information on the Airport Sponsor's mitigation plan that was not available to the FAA at the time of FEIS publication. This appendix includes the following updated or additional information.

1. The October 2005 Mitigation Synopsis supersedes the Draft March 2005 mitigation synopsis that was included in Appendix R of the FEIS.

2. The mitigation plan graphics included in this appendix are generally the same as those included in Appendix R of the FEIS with the following exceptions. There are slight differences on each of the Hydrologic Restoration Graphics. The changes primarily show new areas of proposed enhancements and numbers added to the graphic that correspond to text descriptions of each proposed enhancement activities. These activities are described in general terms in the synopsis with approximate linear feet of stream restoration identified. However, the plan goes into additional detail for each activity and its location ((e.g. Parcel 1 – Site No. 1) Remove road fill and improve existing (defacto) low water crossing).

3. Performance standards and adaptive management policies.

8.0 Performance Standards

This section describes performance standards for various aspects or components of the mitigation plan. These standards provide characteristics and measures to be used to judge whether or not the goals of the mitigation plan have been achieved or are trending toward success. In some cases, alternative acceptable conditions, and remedial or contingency measures are included as well, and are typically prefaced with phrases such as "as appropriate" and "if needed". Major categories of performance standards described below include landscape level standards, ecological community standards, and hydrologic standards. Ecological community standards are further separated by groups of related community types, and integrate mitigation activities such as thinning, planting, and prescribed fire.

8.1 Landscape Level

Performance standards at the landscape level will focus on achieving or trending towards the approximate location, spatial distribution, and acreage of ecological community types indicated in the proposed FLUCFCS maps and acreage tables, based on periodic photo-interpretation and limited ground-truthing. Replication of the exact boundaries and acreages indicated in the mitigation plan are not required, however, the composition and relative distribution of community types should be similar to the proposed conditions.

8.2 Wet Pine Savanna (626), Hydric Pine Flatwoods (625), Upland Pine Flatwoods (411)

Vegetation Canopy/Dominant Trees

Performance standards for this component shall be focused on achieving a shift from the dominance of even-aged slash pine and sand pine planted in rows at very high densities and basal areas to conditions trending toward more open canopies with widely spaced trees, mixed stand age, and a mix of slash and longleaf pine where appropriate. Some areas will be dominated primarily by either slash pine or longleaf pine, as described in the mitigation plan. Presence of other desirable tree species including pond cypress, swamp black gum, sweet bay, various oaks, etc. will be acceptable; however, large expanses of dense titi in the canopy or subcanopy will not be acceptable. Areas largely lacking trees, or with widely spaced tree clusters consisting of a few trees will be acceptable, particularly for wet savanna areas in former clear cuts (for which some areas may approximate wet prairie, FLUCFCS 643). Initially, performance standards include achieving the basal areas prescribed in the thinning plan (e.g., 20-30 or 40-50 square feet/ac depending on location; clear cuts for sand pine areas). Initial slash pine basal areas can be somewhat lower than the prescribed values, but should not be higher. With time, as mature trees increase in size, longleaf seedlings grow and mature, and natural recruitment occurs, basal area may increase above the prescribed values. This will be re-evaluated regularly via the monitoring program. Additional low-intensity thinning can be performed on a 10-year or longer rotation, to re-establish appropriate basal area or tree

densities, if needed. With large mature trees in the future, basal area can exceed the initial prescription as long as an open canopy and widely spaced tree distribution are maintained. Note that use of prescribed fire is also expected to provide natural thinning and control of excessive slash pine and hardwood recruitment. Control of exotic tree species, particularly Chinese tallow, will be undertaken so that exotics comprise <1% of the canopy and subcanopy.

Woody Shrubs

Performance standards for this component shall be focused on achieving a shift from the widespread abundance and dominance of woody shrubs such as titi, gallberry, fetterbush, and wax myrtle, to conditions trending toward more open areas without widespread continuous expanses of uninterrupted woody shrubs. This does not mean that woody shrubs should not be present or should be uniformly sparse, but that a trend towards a mosaic that includes substantial expanses of areas that are not dominated by woody shrubs should develop. Under this performance scenario, some shrubby areas, particularly in flatwoods ("shrubby flatwoods"), on elevated "palmetto islands" within wet savannas, and in xeric habitats would still be acceptable, but a dense shrub layer should not be the dominant vegetation feature at ground level across most pinelands in the mitigation area. In such areas, woody shrub height should be generally less than shrub height under pre-mitigation conditions on the site, and should be reduced by pine thinning operations and prescribed fire (supplemented with mechanical treatment if necessary), and maintained by prescribed fire over the long-term. Upland pinelands in well-drained areas, particularly those formerly planted in sand pine, may appropriately trend towards longleaf pine – xeric oak habitat (FLUCFCS 412), rather than upland flatwoods, and may normally include a significant woody shrub component.

Groundcover Vegetation

Performance standards for this component shall be focused on achieving a shift from the widespread abundance and dominance of woody shrubs to conditions trending toward a mosaic that includes substantial open areas dominated by herbaceous groundcover. Percent cover in wet savannas should trend toward 80% or higher cover of native herbaceous species (see **Appendix A**). Percent cover in wet flatwoods should trend toward 50% or higher cover by native herbaceous species. Initially, in wetland areas, herbaceous cover dominated by early succession species associated with physical disturbance, but capable of carrying prescribed fire, will be acceptable. However, with time, herbaceous species composition should trend towards species more typically associated with periodic fire. A trend toward a general increase in diversity (richness) of native groundcover species should also occur. Control of exotic groundcover species, such as cogon grass in upland flatwoods, will be undertaken so that exotics comprise <1% of the groundcover vegetation.

8.3 Cypress (621), Mixed Forested Wetlands (630, 615, 613, 610), Titi (614)

Vegetation Canopy/Dominant Trees

Performance standards for this component shall primarily be focused on maintaining and enhancing the existing canopy condition in terms of species composition, allowing for natural recruitment and growth of desirable species. If natural tree recruitment is not occurring or appears limited, supplemental planting of pond cypress and mixed hardwoods can be conducted as needed. For titi wetlands (614), dominance of tree-sized titi species or a trend in this direction will be an acceptable condition. However, the overall extent of some titi stands may be reduced or constricted and the affected areas replaced by wet pinelands, an herbaceous ecotone, or other mixed wetlands, all with a likely titi component. A shift or trend of this type would be considered a desirable or acceptable outcome depending on site characteristics. Control of exotic tree species, particularly Chinese tallow, will be undertaken so that exotics comprise <1% of the canopy and subcanopy.

Woody Shrubs

Performance standards for this component shall be focused on achieving a shift from the abundance and density of woody shrubs (titi and fetterbush especially), particularly within the ecotone shared by these communities and the adjacent pinelands, but also, to a lesser extent, within the interior of these communities. This does not mean that woody shrubs should not be present or should be uniformly sparse, but that they should be less abundant and dense, particularly within the ecotone. Woody shrub height should be generally less than shrub height under pre-mitigation conditions on the site (especially within the ecotone), and should be reduced by prescribed fire (supplemented with manual or mechanical treatment if necessary), and maintained by long-term prescribed fire management, understanding that fire in the interior of these communities will typically be less frequent than for the surrounding pinelands.

Groundcover

Performance standards for this component shall be focused on achieving a shift toward the dominance of herbaceous groundcover within the ecotone, and a greater abundance of herbaceous cover with the interior of these communities as well, where appropriate. Within the ecotone, percent cover should trend toward 80% or higher cover of native herbaceous species. Initially, herbaceous cover dominated by early succession species associated with physical disturbance, but capable of adequately carrying prescribed fire, will be acceptable in the ecotone. However, with time, herbaceous species composition in the ecotone should trend towards species more typically associated with periodic fire. A trend toward a general increase in diversity (richness) of native groundcover species in the ecotone should also occur. In the interior of these forested wetlands, if a relatively open canopy is present, percent cover should trend toward 20% or higher cover of native herbaceous species (not including natural open water areas). Where these communities contain closed or nearly closed canopies due to large mature trees or other factors related

to relatively natural community structure, shading may limit herbaceous groundcover to occasional patches such as light gaps, which would be an acceptable outcome. Control of exotic groundcover species, will be undertaken so that exotics comprise <1% of the groundcover vegetation in these communities.

8.4 Freshwater Marsh (641) and Shrub Bogs (640)

Vegetation Canopy/Dominant Trees

Performance standards for this component shall primarily be focused on maintaining open marsh and shrub communities generally lacking trees. This condition will be maintained by existing hydrologic conditions and periodic prescribed fire. Occasional seedlings, saplings, and mature shrub-sized specimens of species such as pond cypress, and swamp black gum would be acceptable under appropriate circumstances, especially in shrub bogs. In addition, if a particular marsh or shrub wetland appears to be naturally succeeding toward a woodland or forested system, an increasing abundance of trees (and shrubs) would be acceptable, and the site would be treated as a different wetland type for future considerations. Control of exotic tree species, particularly Chinese tallow, will be undertaken in these wetland types if needed.

Woody Shrubs

Performance standards for this component shall primarily focus on maintaining a lack of woody shrubs in marsh areas through the use of fire. Occurrence of certain shrub species, such as *Stillingia* spp. and *Hypericum* spp., in marshes would be acceptable. For shrub bogs, performance criteria shall focus on maintaining the existing community structure and species composition, primarily dominated by shrubs such as *Hypericum* spp., *Ilex myrtifolia*, *Stillingia* spp., etc. Performance standards for marsh and shrub communities also include achieving a shift from the abundance and density of woody shrubs within the ecotone shared by these communities and the adjacent pinelands (where applicable). This does not mean that woody shrubs should not be present or should be uniformly sparse within the ecotone, but that they should generally be less abundant and dense. In some cases, application of fire in shrub bogs could result in a trend toward less shrub abundance and the development of marsh or wet prairie communities, which would be an acceptable outcome as well.

Groundcover

Performance standards for this component shall be focused on maintaining and enhancing herbaceous cover and species composition within these communities through the use of prescribed fire. Percent cover in marshes should trend toward 80% or higher cover of native herbaceous species. Percent cover in shrub bogs should trend toward 50% or higher cover by native herbaceous species. Some examples of these communities should trend toward a general increase in diversity (richness) of native groundcover species, however, some examples are already relatively diverse, while others may normally be less diverse due to dominance by a characteristic species (flatwoods marshes near the

coast which are dominated by sawgrass, for instance). Based on existing and future hydrologic conditions, the use of prescribed fire, and other factors, some marsh and shrub wetlands may also begin to approximate wet prairie in the future, or may begin to blend in with surrounding wet savanna as the surrounding pine canopy is opened up. Both of these cases would be considered acceptable outcomes. Control of exotic groundcover species in marsh and wetland shrub communities will be undertaken so that exotics comprise <1% of the groundcover vegetation.

8.5 Hydrologic Restoration and Enhancement

Performance standards for hydrologic restoration and enhancement activities shall be based on the appropriate installation/completion and functioning of planned structures and activities.

For low water crossings (LWCs), an improvement of overall channel and floodplain connectivity and continuity will be achieved, and stream and wetland flows across the crossing will approximate or trend towards adjacent hydrologic and geomorphic conditions outside the area previously influenced by the road, culvert, or other existing structure. In addition, there should not be damming, pooling, or excessive sedimentation upstream of the LWC, erosion under or around the structure, excessive sedimentation within the crossing, scouring or erosion on the downstream side, channel straightening or incision, floodplain restriction, or blocking of normal passage for channel and floodplain associated organisms and waterborne materials (all of which currently occur to various degrees in different locations).

For culvert installation, these will either primarily focus on improving hydrologic connectivity between adjacent wetlands separated by essential forest roads, or will function to maintain adequate drainage in association with essential roads. Culvert installation and maintenance should not result in damming, pooling, erosion, or scouring that would run counter to ecological community and hydrologic goals. In most cases, culvert work is primarily planned to replace existing structures that are not functioning properly, resulting in the reduction or elimination of the problems previously mentioned.

Filling and blocking of major ditches and removal of spoil mounds, berms, or bedding rows for purposes of stream and flowing wetland restoration will function so that flow is re-directed from the ditch system to natural stream channels or flowing wetland systems or to former systems that are being re-established. Former stream channels or wetland flow-ways may not always be precisely re-established in terms of location, however, a trend toward the development of natural channel or flowing wetland geomorphology and hydrology should develop over time.

Where filling and blocking of major or minor ditches are planned within flatwoods, savannas, and depressional wetlands, performance standards involve eliminating or slowing channelized drainage of these wetlands, and in some cases, converting the ditch and associated spoil mounds or berms to more natural landforms and ecological communities.

For road removal and roadside ditch filling, performance criteria will be based on re-establishing natural grades and removing restrictions to natural surface water movement, and the establishment of appropriate native species, with the understanding that at least some of these areas may primarily be maintained in a herbaceous condition to serve as low intensity fire lines where needed.

11.0 Adaptive Management Plan

To ensure that the mitigation meets the objective and goals outlined in this mitigation plan, many measures will be in place to identify whether success is being achieved and to modify mitigation activities to ensure success of the mitigation. Adaptive management is closely related to the monitoring plan and linked directly to the performance standards. Long-term monitoring will identify the progression of the mitigation area toward the performance criteria, and will identify any areas not trending in the desired direction. For any areas not progressing towards the desired conditions, measures outlined in Section 11.2 will be implemented.

11.1 Responsible Parties

Adaptive management will be the responsibility of the permittee or their designated entity, the mitigation area manager, and/or mitigation contractors.

11.2 Potential Challenges and Remedial Measures

Although most of the proposed mitigation activities involve low risk, several potential challenges to achieving success have been identified. These challenges will be discussed as they relate to each individual mitigation activity plan: thinning, planting, hydrologic, burn, and exotic control.

Harvest and Thinning of Existing Planted Pine

Since the goals of the harvest and thinning plan include thinning the existing planted slash pine to a basal area that will facilitate the propagation of longleaf pine and the development of more natural groundcover, reductions or increases in the thinning target basal area may take place to achieve these goals. As stated in the harvest and thinning plan, some areas will be experimentally thinned to a lower basal area of 10 to 20 square feet per acre for comparative purposes. If this lower basal area produces more desirable results, target basal areas may be reduced for future thinning operations in younger stands. In addition, supplemental thinning in flatwoods and savanna areas could be conducted for older stands. If excessive rutting unexpectedly occurs during thinning operations, thinning operations will be halted and relocated to drier areas until conditions improve, and excessively rutted areas will be rehabilitated.

Longleaf Pine Planting and Survival

Longleaf pine is proposed to be planted on a wide-spread scale in uplands and wetlands with shorter hydroperiods. This planting scheme was developed with the knowledge that longleaf pine may not survive or do well in all locations, due to hydroperiod, fire, etc. By conducting widespread planting at low densities, it is anticipated that longleaf pine will become established in the locations where it would most likely occur naturally. Mortality due to wetness and fire is expected and accepted, and no specific percent survival has

been specified as long as longleaf pine becomes established in a variety of locations and habitats. Higher survival is expected in some upland areas, and if survival there is poor, replanting will take place. In other areas, replanting will be based upon best professional judgment concerning the cause of low survival in relation to habitat conditions.

Several potential challenges to the success of longleaf have been identified. These challenges relate to available sunlight, competition from other vegetation, target planting densities, predation by feral hogs, mortality and delayed growth due to brown-spot, mortality from excessively wet soils, and mortality from fire. Remedial measures concerning available sunlight were addressed previously under harvest and thinning of planted pine. The prescribed fire conducted prior to planting is expected to reduce competition with herbaceous and woody vegetation while the longleaf pine are in the grass stage. Subsequent prescribed fire should continue to control herbaceous and woody vegetation and allow the longleaf to enter the subcanopy strata. The potential downfall with this strategy is that any fires conducted before the longleaf reach 1.5 meters tall but after the longleaf leave the grass stage could lead to high mortality due to fire. This can be reduced by conducting cool season burns while the longleaf are vulnerable. Supplemental plantings would be planned for any area that experiences widespread longleaf mortality due to fire.

Brown-spot needle blight, caused by *Scirrhia acicola,* is most damaging while longleaf pine are in the grass stage and can lead to increased time in the grass stage and mortality. The risk from brown-spot will be reduced by limiting the amount of time the longleaf will remain in the grass stage through the use of container grown seedlings, which leave the grass stage quicker than bareroot seedlings, and use of prescribed fire to stimulate longleaf pine to reach the height growth stage. Additional controlled burns may also be used to control brown-spot if infections develop within a stand.

If proposed planting densities are found to be producing pine stands that are either too sparse or too dense, future planting densities would be either increased or reduced. Additionally, if longleaf survival was decreased due to poor stock, incorrect planting methods, drought, or disease, supplemental planting could occur. Although excessively wet areas are not targeted for longleaf planting, some mortality may be due to wet conditions. If this occurs, no supplemental plantings of longleaf will be conducted in these areas, since longleaf may not be appropriate due to hydroperiod.

Predation of longleaf pine seedlings by feral hogs could become an issue in some locations. Measures outlined in Section 7.7 should help prevent large-scale predation of seedlings by hogs. Particular hog control measures to protect longleaf seedlings include increased monitoring for hog activity in areas scheduled to be planted, targeted hog eradication in planting areas, and temporary fencing of planted areas. Longleaf planting areas that are significantly affected by hog predation over a wide area will be replanted.

Hydrologic Restoration

Hydrologic structures, such as ditch blocks, low water crossings, and culverts, installed as part of the hydrologic restoration plan will be inspected periodically in accordance with the monitoring and long-term management plan. If any structure is determined to be functioning incorrectly, it will be serviced or redesigned and replaced depending upon the nature of the problem. Likewise, if unanticipated, undesirable effects, such as excessive flooding or ponding, occur due to specific hydrologic restoration activities, the design will be reevaluated and redesigned, as necessary to correct the situation.

Prescribed Fire

Adaptive management measures in place to ensure that prescribed fire meets ecological objectives and goals are contained within the fire management plan (see **Appendix C**). First and foremost, measures stressing fire safety are described within the plan. Individual prescriptions will be written for each burn to meet safety concerns, smoke management issues, and ecological restoration goals. In order to meet safety concerns and restoration goals, excessive woody vegetation (particularly titi and oaks) may be mechanically thinned in some areas prior to the initial dormant season burns to reduce fuel loads and facilitate the spread of fire. In addition, in areas where several rotations of burning alone has not adequately controlled woody shrubs and vines, mechanical or manual thinning may be combined with burning to achieve shrub control, followed by burning for long-term management[1]. Additionally, the burn plan allows for the variation of the timing of burns to achieve specific restoration goals. This includes accelerating or delaying some burns to promote longleaf pine regeneration during the early stages of the mitigation project.

Exotic Species

As stated previously, exotic species infestation is not currently a problem within the mitigation area, nor is it expected that a significant exotic species problem will develop. A preventative approach is expected to keep the risk of exotic species establishment low. Site reconnaissance conducted under the monitoring and long-term management plans should identify exotic species occurrences within the mitigation plan. Areas of cogon grass or Japanese climbing fern will be immediately treated with appropriate herbicides to control these species. Significant occurrences of Chinese tallow or camphor tree will also be treated with appropriate herbicides to control the spread of these species. It is desired that coordination with Bay County Public Works will lead to a management plan for controlling cogon grass along the CR 388 right-of-way. Controlling cogon grass along the right-of-way should help prevent the establishment of this species within the mitigation area.

[1] Mechanical thinning would be conducted in planted pine areas using appropriate equipment when thinning in wetter areas, while manual thinning would be done in smaller, more sensitive high quality wetlands.

12.0 Passive Recreation Activities

Consistent with the Sector Overlay, the airport resulting from its direct and secondary impacts to wetlands, the 9,858 acre mitigation area represents a significant passive recreation resource to the community at large. The airport mitigation area is part of the larger West Bay Preservation Area land use category designated within the West Bay Area Sector Plan Overlay Map for Bay County. The Sector Plan identifies the following uses as allowable under the West Bay Preservation Area land Consistent with the Sector Overlay, the airport resulting from its direct and secondary impacts to wetlands, the 9,858 acre mitigation area represents a significant passive recreation resource to the community at large. The airport mitigation area is part of the larger West Bay Preservation Area land use category designated within the West Bay Area Sector Plan Overlay Map for Bay County. The Sector Plan identifies the following uses as allowable under the West Bay Preservation Area land use category:

- Managed mitigation areas.
- Natural resource management
- Greenways and trails.
- Hunting and fishing activities.
- Passive recreational activities.
- Essential public utilities, and easements, excluding wastewater treatment plants and power plants.
- Other similar uses.

Consistent with the goals and objectives of the Sector Plan, the West Bay Detailed Specific Area Plan further refined the allowable passive recreation uses within its boundaries to include:

- Nature trails and pathways
- Boat/dock access
- Picnic areas and pavilions
- Observation towers
- Nature center
- Boardwalks
- Boat ramps
- Parks and open space
- Water supply wells
- Easements

The enhanced and restored upland and wetland habitat areas within the airport mitigation area provide the framework within which to provide the meaningful passive recreation opportunities desired by Bay County and set forth in its Comprehensive Plan, of which the West Bay Area Sector Plan, a collaborative effort of the County and State, is a part.

The enhanced and restored areas within the airport mitigation area will provide a unique view of the area's ecosystem as it existed prior to disturbance from more recent human

activity. The inclusion of passive recreation activities will also increase the sense of environmental stewardship by area residents who come to the site. Finally, the area's use as passive recreation within a controlled setting will aid in site security and resource protection. Experience shows that controlled access and use diminishes the occurrence of destructive activities resulting from even a few that trespasses.

The configuration of the mitigation areas, with character ranging from pine flatwoods to bay/marsh edge, provides a diversity of potential passive recreational experiences at a regional scale not available in most areas of the State. Just as the Sector Plan and its associated Detailed Specific Area Plan have provided a model for large scale planning in the State, the joint use of the airport mitigation area for passive recreation provides a model for the rest of the State to follow for resource restoration, protection and management.

The final design of the recreation component will be coordinated with the location of the remaining timber roads which will also be used for mitigation management and fire control. The timing of recreation development and utilization will be coordinated with the mitigation implementation and adaptive management schedule with mitigation activities taking precedence. The joint use of the area for mitigation and recreation will also allow the area to become a living laboratory for residents and students to better understand the dynamics of the West Bay area ecosystem. Passive recreation activities within the airport mitigation area will be consistent with the West Bay Area Sector Plan.

Mitigation Synopsis: Panama City – Bay County International Airport Relocation

An approximately 10,000 acre mitigation area is proposed as compensation for wetland impacts at the proposed airport relocation site based on the potential 50-year full build-out scenario. The mitigation area is divided into three main parcels: Parcel 1 includes 1735 acres directly south of CR 388 between Crooked Creek and Burnt Mill Creek and extending southward to the Gulf Power Company power line easement. Parcel 2 includes 6,388 acres directly south of CR 388 to the east of Burnt Mill Creek and extending southward to West Bay and the power plant discharge canal. CR 2300 forms the eastern boundary of the southern portion of Parcel 2. Parcel 3 includes 1,735 acres south of the power plant discharge canal, extending southward to West Bay Point. West Bay also forms the western boundary of Parcel 3. Each parcel has been further divided into management units based on existing landscape features (mainly unpaved forest roads). There are a total of 42 management units in the mitigation area, averaging 200-300 acres in size each.

Habitat types present in the mitigation area are dominated by planted pine wetlands and uplands. Other habitat types include titi wetlands, mixed forested wetlands, cypress wetlands, pine flatwoods, freshwater marsh/shrub wetlands, tidal marsh, and small streams. The main goal of the mitigation plan is to convert planted pine areas back to wet pine flatwoods, wet pine savanna, mesic flatwoods, and sandhill habitats that historically occurred in the area, via restoration and enhancement. Restoration, enhancement and preservation of the other habitat types listed above will also take place. Based on habitat acreages, the planned mitigation activities, and the estimated before and after condition of the various habitat types, a detailed WRAP analysis has been conducted that shows a surplus of mitigation lift relative to functional loss from wetland impacts (including direct and indirect impacts) for each development phase and for full build-out at the airport relocation site through 50 years. All mitigation areas will be placed in Conservation Easements to ensure their long-term protection.

The mitigation plan consists of a series of interrelated plans that address the following major mitigation activities: planted pine thinning; prescribed fire; longleaf pine planting; hydrologic restoration; exotic species control; wildlife management; dump site removal; monitoring; and long-term management.

Thinning

The planted pine thinning plan depicts planted pine stand ages, a thinning schedule, and prescribed thinning densities based on target ecological community types and whether or not longleaf pine will be planted in an area. Planted pine stands in the mitigation areas were planted between 1973 and 1999 (ranging in stand age from 6-32 years old in 2005). Final thinning to a prescribed basal area (BA) will initially take place for all stands that are 25 years old or older. Younger stands will enter mitigation and be thinned to the prescribed basal area as they reach 25 years old. Future wet pine savanna areas will primarily be thinned to a basal area of 20-30 square feet/acre. A few management units or portions of management units will be thinned to 10-20 square feet/acre for

comparison/adaptive management purposes. Future pine flatwoods and sandhill areas that will be planted with longleaf pine will also be thinned to a BA of 20-30. Future wet pine flatwoods that will not be planted with longleaf pine, mainly near West Bay in future coastal slash pine flatwoods, will be thinned to a BA of 40-50. All planted sand pine uplands (future longleaf pine sandhills) will be clear-cut. Natural stands of mixed longleaf and slash pine, and natural stands of coastal slash pine flatwoods will not be thinned under the initial thinning plan. Wetlands dominated by cypress and/or hardwoods will not be harvested or thinned. Also, incidental harvest of individual cypress, hardwood, and cabbage palm trees greater than 6 inches DBH growing in planted pine stands will be minimized during pine thinning operations. Standing dead trees and snags will also be retained whenever possible. The thinning plan includes voluntary 35-foot special management zones (SMZs) around cypress domes, gum ponds, flatwoods marshes, and small depressional mixed forested wetland areas; and 50-foot special management zones (SMZs) adjacent to tidal creeks, tidal marsh, and West Bay to provide additional protection to these areas during thinning operations. Standard SMZs along streams and creeks will also be observed, according to state forestry Best Management Practices (BMPs). Excessive rutting should be avoided by managing thinning operations in wetland areas outside the wet season and around periods when on-site soil moisture conditions are inappropriate. This will include onsite reconnaissance and direction of forestry crews and equipment by supervising foresters and mitigation ecologists. If excessive rutting does unexpectedly occur, thinning operations will be halted and relocated to drier areas until conditions improve, and excessively rutted areas will be rehabilitated.

Prescribed Fire

The prescribed fire plan addresses the use of fire as a restoration and management tool, primarily in pine flatwoods, savanna, and sandhill habitats. Following the thinning of planted pine stands, the prescribed fire plan calls for up to three initial dormant season burns per management unit on a 1-2 year rotation, followed by the implementation of growing season burns on a 3-5 year rotation into perpetuity. The goals of the dormant season burns are to modify and promote fuel characteristics favorable for growing season fire prescriptions while protecting large mature pines and encouraging the expansion of herbaceous ground cover. In addition, the dormant season burns will be aimed at reducing the height and volume of mid-story fuels. The goals of the growing season burns will be to reduce and control woody shrub cover, to promote and maintain natural herbaceous groundcover, and to keep fuel loads low enough to safely burn during the growing season in subsequent years. The roughly 200-300 acre management units described above will comprise the major burn units. In some cases, additional fire lines may be needed to augment the management unit boundaries, but use of such lines will be minimized, especially in wetland areas. Initial early growing season burns may be possible on some management units, and will be used preferentially in place of initial dormant season burns when appropriate. Occasional dormant season burns will also be mixed into the growing season burn rotation. Some variation on the timing of growing season burns will also occur within management units (e.g., an early growing season burn one year followed by a mid or late growing season burn during the next burn rotation, or

vice versa, for a particular unit). The mixing of occasional dormant season fires into a growing season fire regime, and the variation of timing on growing season burns will mimic a more natural fire regime and promote more natural plant communities and wildlife habitat. Some use of dormant season fires may also be needed to protect planted longleaf pines once they leave the grass stage and before they reach heights where fire mortality is less of a concern. Occasional dormant season burns will also promote natural longleaf recruitment and regeneration in the more distant future. Fire will be allowed to burn into non-pine dominated habitats such as cypress domes, flatwoods marshes, salt marshes, etc., when conditions allow and when it would not result in a catastrophic situation.

Planting

The planting plan depicts longleaf pine planting densities based on target ecological community types, soils, and elevation. Longleaf planting will take place after thinning operations and at least one application of prescribed fire have occurred. Containerized longleaf seedlings will be used, and all areas will be hand planted in an irregular pattern (not in rows or on precise spacing intervals). Roughly 1,800 acres of future pine flatwoods that have been thinned will be hand planted at densities of 50 seedlings per acre. Roughly 625 acres of future pine flatwoods and sandhill areas that have been clear-cut will be planted at densities of 100 seedlings per acre. Future wet savannas will have longleaf planted in scattered clusters on small slightly elevated "palmetto islands" identified using historic aerials. These "islands" will be hand planted with 1-5 longleaf seedlings depending on the size of the island. Roughly 2,300 of these "islands" will be planted in savanna areas spanning roughly 2,800 acres.

Hydrologic Restoration

The hydrologic restoration plan includes a number of related activities, including the installation or improvement of low water crossings and culverts, the re-routing of water from major interior ditches to historic flow ways, the restoration of former stream courses, removal of fill from historic floodplains, the reconnection of severed wetland systems, ditch back filling and plugging, and road removal. Each specific hydrologic restoration and road removal area will include survey work (profiles and cross-sections), engineering calculations and design, and the development of construction plans and specifications. Approximately 47 low water crossings are planned to restore more natural hydrologic conditions to streams and flowing wetlands (linear wetlands which typically have flowing surface waters). Overall, approximately 85,500 linear feet of stream and major ditch work is planned (roughly 56% directly related to stream and flowing wetland restoration). This linear estimate does not include enhancements resulting from road and roadside ditch removal, or the upstream and downstream effects of low water crossing installation and associated hydrologic improvements. Roughly 42,000 linear feet of road retirement and removal (upland to wetland restoration) is also planned. An additional 105,000 linear feet of stream and flowing wetland surface waters will be preserved and indirectly enhanced by surrounding mitigation activities and long-term ecosystem management including pine thinning, prescribed burning, installation of low water

crossings, road removal, and cessation of timber management activities such as bedding, mechanical site preparation, row planting, and widespread fertilizer and herbicide applications. The extensive pine thinning planned for the site will also provide hydrologic enhancement to wetlands across the entire mitigation area, due to reduced evapotranspiration.

Exotic Control

Invasive exotic plant species of concern have been documented in roughly 30 sites across the mitigation areas. Most of these sites are locations with Chinese tallow. A few locations with cogon grass and camphor tree have also been documented. Chinese tallow is more widespread in Parcel 3, especially along the forest roads and ditches, including additional areas outside the 30 sites mentioned above. Elsewhere, tallow is mainly limited to individual plants found at a few dump sites throughout the mitigation area. Chinese tallow and camphor tree abundance will be reduced and controlled using Triclopyr herbicide (brand names such as Pathfinder and Garlon4 are examples). The trunks of larger seedlings, saplings, and trees will be slashed with a machete or saw and the herbicide applied directly to the slashed area. Herbicide will be directly applied to the foliage of smaller seedlings and saplings. All herbicide applications will be conducted in accordance with standard BMPs. Cogon grass has only been documented in a few limited sites, and these have already been treated by St. Joe Timberlands upon discovery. Cogon grass has also been reported growing along CR 388 on mowed roadsides, therefore, it is assumed that cogon grass has the potential to invade the mitigation areas in the future without regular preventive management. Cogon grass found in the mitigation areas will be treated with Glyphosate herbicide (brand names such as Roundup and Rodeo are examples). Coordination with County road maintenance officials will take place to discuss the proliferation and spread of cogon grass along CR 388. Japanese climbing fern has not been documented on the mitigation site, but one small occurrence (single stem that was removed) been located in one off-site location near the mitigation areas. Any climbing fern discovered on the mitigation site during regular reconnaissance and monitoring will be documented and treated immediately.

Wild (feral) pigs and pig sign (rooting disturbance) have been observed throughout the mitigation areas (all parcels). Rooting was particularly abundant in Parcel 1 in mid-2004. A professional shooting and trapping program will be employed to control hog populations, in coordination with all appropriate agencies and in accordance with pertinent regulations. Regular coordination with recreational hunters will also take place, to encourage hunters to take wild pigs whenever possible (within existing state hunting regulations) and to discourage activities that augment pig populations.

Wildlife Management

Wildlife management on the site will primarily consist of passive habitat enhancement and preservation achieved by thinning; prescribed fire; planting; retention of cypress, hardwoods, cabbage palms, and standing dead trees and snags; hydrologic restoration; road removal; exotic control; protection and enhancement of isolated wetlands and

streams; etc. Wild hog management would additionally be considered a direct wildlife enhancement activity since hogs both prey upon and compete with native wildlife. Wildlife species expected to benefit from the mitigation activities described above include: gopher tortoise and various associated species including the Eastern indigo snake, Florida black bear, various wading birds, bald eagle, and flatwoods salamander.

Additional active management techniques that could be utilized would include installation of wood duck boxes in larger cypress, gum, and mixed forested wetland areas; installation of American kestrel and eastern bluebird nesting boxes in pine savanna areas; installation of osprey/bald eagle nesting platforms near the coast; and relocation of offsite gopher tortoises to restored/enhanced upland habitats. Finally, coordination will take place with Gulf Power Company to determine if vegetation plantings or other passive means can be used near the access roads/bridges that cross the power plant discharge canal to enhance wildlife crossings between Mitigation Parcels 2 and 3. See also long-term management, below, for additional future wildlife management opportunities.

Dump Site Removal

Approximately 40 small dump sites have been documented in the mitigation area, particularly along the forest roads and at forest road junctions. Dump materials consist mainly of "white goods" such as washers, dryers, refrigerators, as well as automobile scraps, old tires, construction debris, etc. These dump sites will be removed and properly disposed of at the onset of mitigation activities.

Monitoring

Baseline and post-mitigation implementation monitoring has been proposed. Qualitative baseline monitoring has already been conducted at roughly 200 randomly located field stations in planted pine areas. Another roughly 800 qualitative field stations associated with high quality wetlands, drainage structures, roads, ditches, streams, exotic species, listed species, dump sites, etc. have also been completed. Baseline and post-mitigation quantitative monitoring stations are proposed that would encompass roughly 10-20% of the random qualitative planted pine stations. Quantitative monitoring will entail the use of large fixed field plots (50m x 20m) or transects (100m) and repeated quantitative measures of: (1) canopy and subcanopy tree density, basal area, species composition, and individual tree size (diameter at breast height); (2) woody shrub percent cover, height, and species composition; and (3) groundcover percent cover, species composition, and species richness/diversity. Groundcover parameters will be assessed in a minimum of 10 1-m^2 replicate quadrats within each larger field plot/transect. Repeated photo-points will also be recorded at each quantitative station. Peizometers or staff gauges will also be placed at strategic locations to record water table and surface water levels before and after mitigation implementation. Baseline quantitative vegetation monitoring will take place during fall (September-Nov) prior to the onset of mitigation activities across most of the site. Following mitigation implementation, quantitative monitoring is proposed annually for the first 5 years. After this period, monitoring will be staggered every 5

years. In addition to ground-based monitoring, vertical aerial photography will be acquired and photo-interpreted 5 years after the onset of mitigation (in fall), and every 10 years afterward, for comparison with pre-mitigation photography acquired in September 2003 and photo-interpreted to determine ecological community types (using FLUCFCS).

Long-term management

Long-term management of the site will include regular reconnaissance and site security. Site security will include maintenance of locked access gates, signage, and possible use of fencing in some areas, if needed. Conservation Easements will also provide for long-term legal protection of the mitigation area. The major long-term resource management activity will be continued use of prescribed fire, in perpetuity. This will include burning on a 3-5 year rotation, dominated by growing season burns, but allowing for a mix of timing on growing season burns and occasional dormant season burns. As longleaf pine plantings mature over time, some additional selective thinning of slash pine may also be performed periodically, on roughly a 10-year rotation within any particular management unit. Any thinning under long-term management would use passive or low impact methods and not result in severe rutting. Supplemental plantings of longleaf or cypress/mixed hardwoods to augment natural recruitment may also occur in selected areas as needed. Continued monitoring and reconnaissance on the site will also be performed to detect any exotic species problems that may arise over time. It is expected that periodic localized treatment of exotics such as Chinese tallow, cogon grass, and Japanese climbing fern will be performed under long-term management of the site. Sustained management of wild hogs will also continue. Maintenance of hydrologic structures such as low water crossings will take place periodically, as will forest road management activities (including additional potential road retirement and removal sites). Passive and active wildlife enhancement will continue under long-term management. In addition, opportunities will likely exist for enhancement/restoration of wild turkey and quail populations on the site once habitat restoration and enhancement activities are in effect. In the longer term, the mitigation area could also potentially contribute to restoration and management of red-cockaded woodpecker, in coordination with other existing and planned natural resource management areas in the region. Finally, management of passive recreation activities, such as hiking, will be incorporated into long-term management of the mitigation areas.

Hydrologic Restoration Sites – Conceptual Descriptions

In the following section, specific hydrologic restoration sites are described. **Figures D-1** through **Figure D-4** show the locations of these restoration areas. **Figures D-5** through **Figure D-8** illustrate typical cross sections

Parcel 1

Site No.

1) Remove road fill and improve existing (defacto) low water crossing.

2) Construct low water crossing (or bridge), remove fill for road that is in floodplain of the stream.

3) Restore historic stream/flowing wetland channel, via re-grading and removing bedding rows that block/divert natural flow.

4) Remove road and fill roadside ditches, return to natural grade.

5) Install new culvert/pipe, sized appropriately.

6) Restore natural channel/drainage way leading toward large basin swamp to south. Install ditch block near juncture of historic flow-way and current ditch system. Install additional ditch blocks at regular intervals along larger ditch that runs parallel to road, roughly 30 ft from road (not the roadside ditch). Re-grade historic channel location and remove bedding rows as needed so flow is not blocked/diverted. Also, install LWCs in two locations near road and flow-way junctures to enhance connectivity.

7) Remove road and fill roadside ditches, return to natural grade.

8) Remove pipe and road fill through stream/floodplain, install low water crossing.

9) Remove pipe and road fill through stream/floodplain, install low water crossing. Move crossing to north to natural flow-way location.

10) Remove fill for road and improve existing (defacto) low water crossing.

11) Remove road, associated ditch, and low water crossing from wetland and stream, including various drainage/construction debris at crossing.

12) Backfill ditch, install pipe at road juncture (if needed), install turn-outs for roadside ditches to north at regular intervals as needed to divert ditch flow back to wetlands.

13) Backfill/plug interior ditch, install new pipe with spreader at road on north end to maintain access.

14) Remove road, culvert, and fill roadside ditches, return to natural grade.

15) Remove road and fill roadside ditches, return to natural grade.

16) Install new culvert/pipe, sized appropriately.

17) Remove road fill and improve existing low water crossing.

Parcel 2

Site No.

1) Retire road; install new pipe/culvert, sized appropriately.

2) Remove road fill and improve existing low water crossing. Improve road to reduce erosion potential.

3) Remove pipe and road fill through stream/floodplain, install low water crossing.

4) Backfill/plug interior ditch.

5) Plug large ditch running parallel to road (not roadside ditch). Install culverts and/or low water crossings as appropriate to restore natural connection within large historic basin/drainage drainage swamp. Retire road to the north and remove existing pipe.

6) Remove pipe and road fill through stream/floodplain, install box culvert or low water crossing.

7) Remove road and fill roadside ditches, return to natural grade.

8) Remove road and fill roadside ditches, return to natural grade.

9) Remove road fill and improve existing low water crossing.

10) Plug large ditch running parallel to road (not roadside ditch). Install low water crossing at east end to restore natural connection of historic drainage system.

11) Remove pipe and road fill through stream/floodplain, install low water crossing.

12) Backfill/plug small interior ditch.

13) Retire road north of bend. Remove road south of bend and fill roadside swale, return to natural grade.

14) Remove pipe and road fill through stream/floodplain, install low water crossing.

15) Remove road and fill roadside ditches, return to natural grade.

16) Remove road fill and improve existing low water crossing.

17) Remove pipe and road fill through stream/floodplain, install low water crossing.

18) Remove road and fill roadside ditches, return to natural grade.

19) Construct low water crossing (or bridge), remove bridge and road fill that is in floodplain of the stream.

20) Remove road fill and improve existing low water crossing. Move low water crossing 100 feet to southwest.

21) Remove fill for road and improve existing low water crossing.

22) Remove pipe and road fill through stream/floodplain, install low water crossing.

23) Remove road and fill roadside ditches, return to natural grade.

24) Remove fill for road and improve existing low water crossing.

25) Remove pipe and road fill through stream/floodplain, install low water crossing.

26) Propose to remove pipe and road fill through stream/floodplain, install low water crossing. Structure within powerline easement and may create issues with access. Will Coordinate with Gulf Power.

27) Propose to remove fill for road and improve existing low water crossing. Structure within powerline easement. Will coordinate with Gulf Power.

28) Restore natural channels/drainage ways leading toward Marl Hammock Branch to the southwest. Install ditch block near juncture of historic flow-ways and current ditch system. Install additional ditch blocks at regular intervals along northern ditch, northwestern portion of ditch, and southeastern portion of ditch. Re-grade historic channel location, remove berms along existing channel, and remove bedding rows as needed so flow is not blocked/diverted. Install ditch blocks along ditch within historic stream channel/drainage way location to retard drainage of water from the system and provide access to associated floodplain. Install low water crossing on road between 2H and 2I to help reconnect historic drainage.

Also, install new pipe with spreader where ditch running north/south crosses road to maintain access. Remove road fill and improve existing (defacto) low water crossing where current ditch and historic drainage flowed into 2I from 2C. Remove fill for road and install low water crossing in south east of 2I where Marl Hammock Branch

historically entered 2J. Remove pipe and road fill through stream/floodplain where Marl Hammock Branch crosses into 2I from 2H, install low water crossing.

29) Remove fill for road and improve existing low water crossing to restore connectivity of historic drainage.

30) Restore natural channel/drainage way leaving Jackson Titi. Install ditch block near juncture of historic flow way and current ditch. Install additional ditch blocks at regular intervals along ditch until ditch meets with historic drainage way. Re-grade historic drainage location and remove bedding rows as needed so flow is not blocked/diverted. Upstream of initial ditch block, add ditch plugs to slow flow velocity and effectively raise stream invert to provide better access to floodplain. Also, remove pipe and road fill through stream/floodplain and install low water crossing.

31) Remove pipe and road fill in historic drainage and install low water crossing to restore/improve connectivity of historic drainage system. Potential for regrading/removal of bedding rows in historic drainage.

32) Remove road and fill roadside ditches. Restore to natural grade. Will coordinate with Gulf Power.

33) Remove road fill with stream/drainage way channels and improve existing low water crossings.

34) Backfill/plug small interior ditch.

35) Remove road and fill roadside ditches. Restore to natural grade. Remove berms along road at northeast terminus.

36) Restore natural channel/drainage way. Install ditch blocks where ditch junctions with historical channel. Re-grade historic drainage location and remove bedding rows as needed so flow is not blocked/diverted. Re-grade and install ditch plugs as necessary to restore historic sinuousity, retard flow, and provide access to floodplain where ditch is located in historic stream channel/drainage way location. May need to relocate road in 2P or install low water crossings as needed to allow drainage to return to historic location. Remove berms along ditch channel. Remove pipe and road fill in stream/floodplain and install low water crossing. Coordinate with Gulf Power for work around and within powerline easement.

37) Restore natural channel/drainage way. Install ditch blocks where ditch junctions with historical channel/drainage way. Re-grade historic drainage location and remove bedding rows as needed so flow is not blocked/diverted, particularly in section where historic drainage split. Re-grade and install ditch plugs as necessary to restore historic sinuousity, retard flow, and provide access to floodplain where ditch is located in historic stream channel/drainage way location. Remove two pipes and road fill along the western boundary road of 2W and install low water crossings. Remove road fill and install low

water crossing at corner of 2P and 2Q to facilitate restoration of historic drainage. Coordinate with Gulf Power for work around and within powerline easement.

Install ditch blocks in eastern ditch draining small 614 system in 2Q to retard the movement of water to help rehabilitate this historic drainage system. Remove pipe and road fill where ditch crosses road and install low water crossing.

38) Install ditch blocks along ditched drainage way to retard flow of water and allow access to associated floodplain. Remove bridge and road fill from drainage way and install low water crossing or new bridge as appropriate. Install ditch block where southwestern east-west ditch junctions with historic drainage. Install additional ditch blocks along ditch at regular intervals to prevent drainage of surrounding wetlands. Install ditch block where northwest ditch junctions with historic drainage. Install additional ditch blocks along ditch at regular intervals to prevent drainage of surrounding wetlands. Clean sediment from pipe or install new pipe where small northern ditch crosses road.

39) Retire road.

40) Install ditch blocks along ditched drainage way to retard flow of water and allow access to associated floodplain. Remove pipe and road fill from drainage way and install low water crossing.

41) Remove road and fill roadside ditches. Restore to natural grade.

42) Remove road and fill roadside ditches. Restore to natural grade.

43) Install ditch blocks at regular intervals within series of ditches flowing to main ditch to prevent drainage of adjacent wetlands. Clean sediment from two pipes or install new pipes where ditches cross road bisecting 2W.

44) Replace damaged pipe with appropriately sized pipe.

Parcel 3

Site No.

1) Remove road fill and install low water crossing.

2) Remove road fill and fill roadside ditches. Restore to natural grade. Removal of road will restore hydrologic connection of 641 system.

3) Remove road fill and improve existing (defacto) low water crossing.

4) Remove road fill and improve existing (defacto) low water crossing.

5) Remove road fill and improve existing (defacto) low water crossing.

6) Install ditch blocks at regular intervals within east-west ditch to prevent drainage of adjacent wetlands. Keep small roadside ditch to facilitate drainage away from road.

7) Install ditch blocks at regular intervals within northern small east-west ditch to prevent drainage from depressional wetland. Install ditch blocks at regular intervals in small southern east-west ditch to prevent draining of adjacent wetlands. Install ditch blocks at regular intervals within large north-south ditch to prevent drainage of adjacent wetlands and surrounding area. Remove pipe and road fill where ditch/natural drainage way crosses from 3G to 3F and install low water crossing.

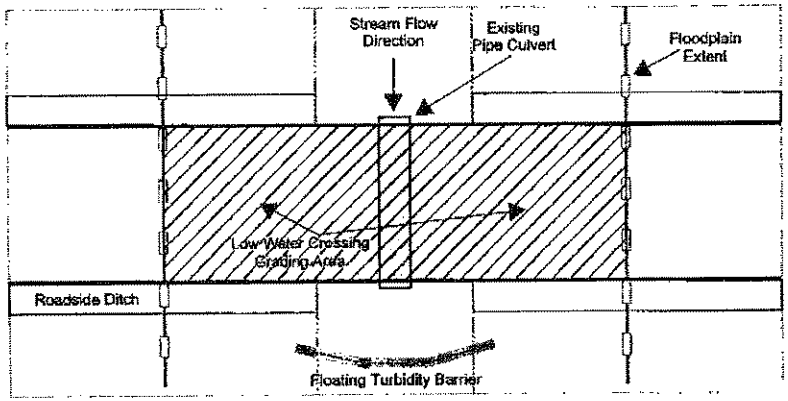
8) Remove road and fill roadside ditches. Restore to natural grade.

9) Install ditch blocks at regular intervals within ditch draining large gum swamp. Install new appropriately sized pipe where ditch crosses road.

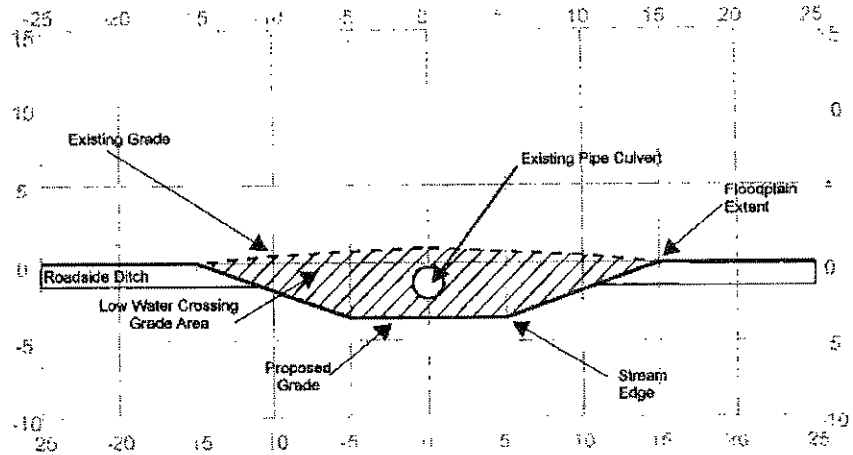
10) Remove road and fill roadside ditches. Restore to natural grade.

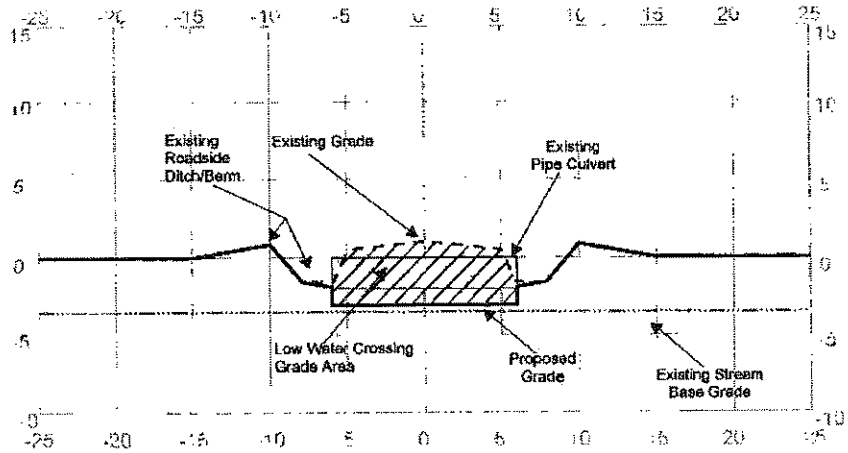
11) Install pipes or culverts as needed to re-establish hydrologic connectivity of 641 system.

Plan View



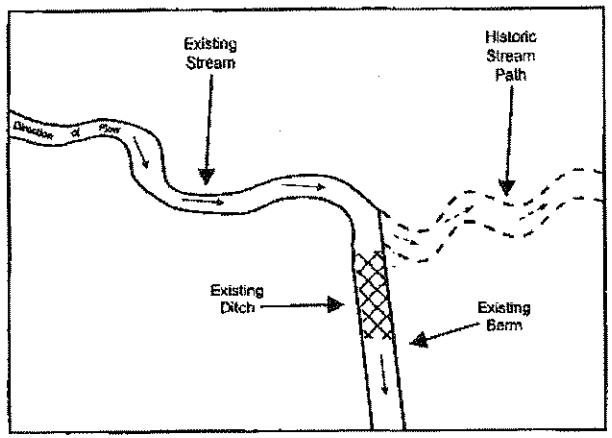
Cross Sectional View



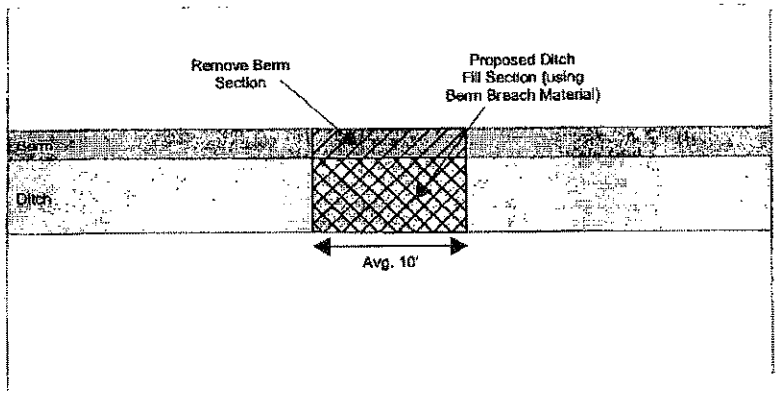


Longitudinal View

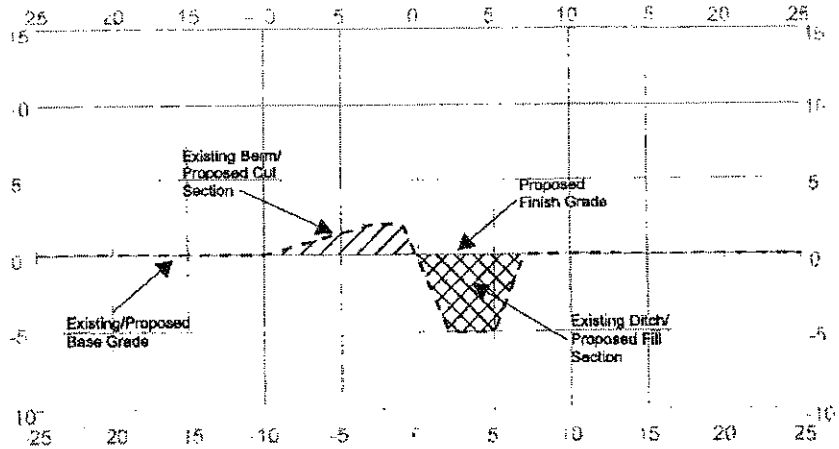
Panama City - Bay County International Airport PBSJ	PROJECT: Panama City-Bay County International Airport (Proposed) DATE: 3/23/05 DRAWN BY: RTC FILE NAME: I:\Projects\070554.21_PC Mitigation Design\GIS\MXD\ Mitigation Plan Proposed LWC_Typical.mxd	MITIGATION	FIGURE D-5. LOW WATER CROSSING (TYPICAL SECTION)	Scale: N.T.S



Plan View



Cross Sectional View



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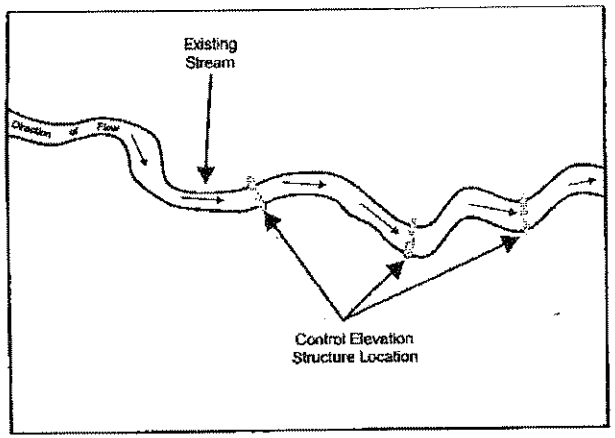
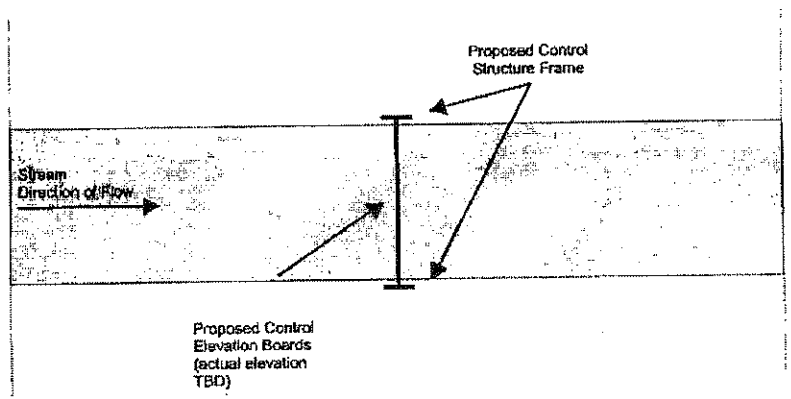
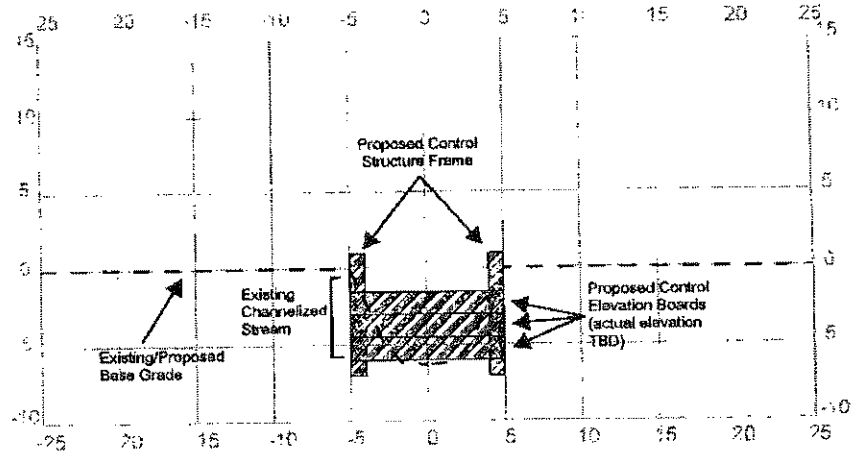


Plan View



Cross Sectional View



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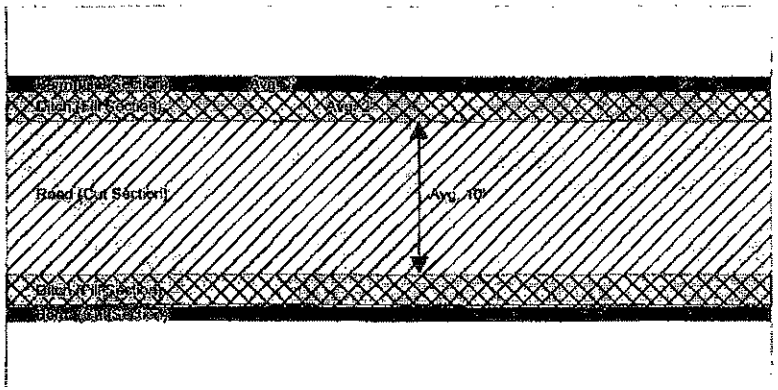
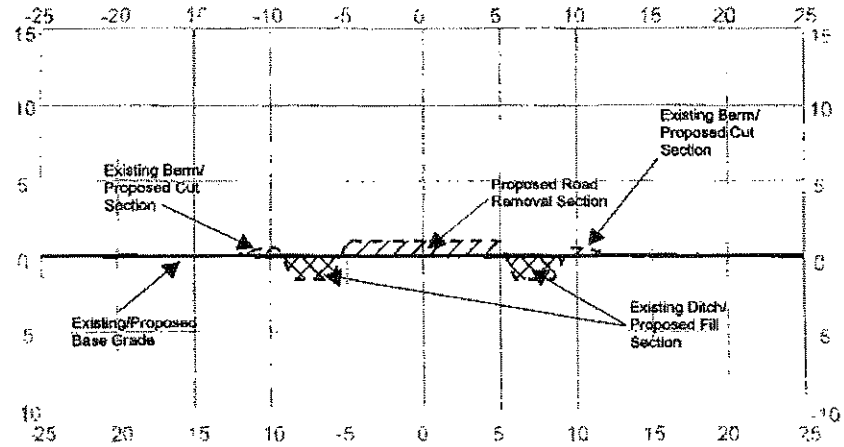
Plan View



Cross Sectional View



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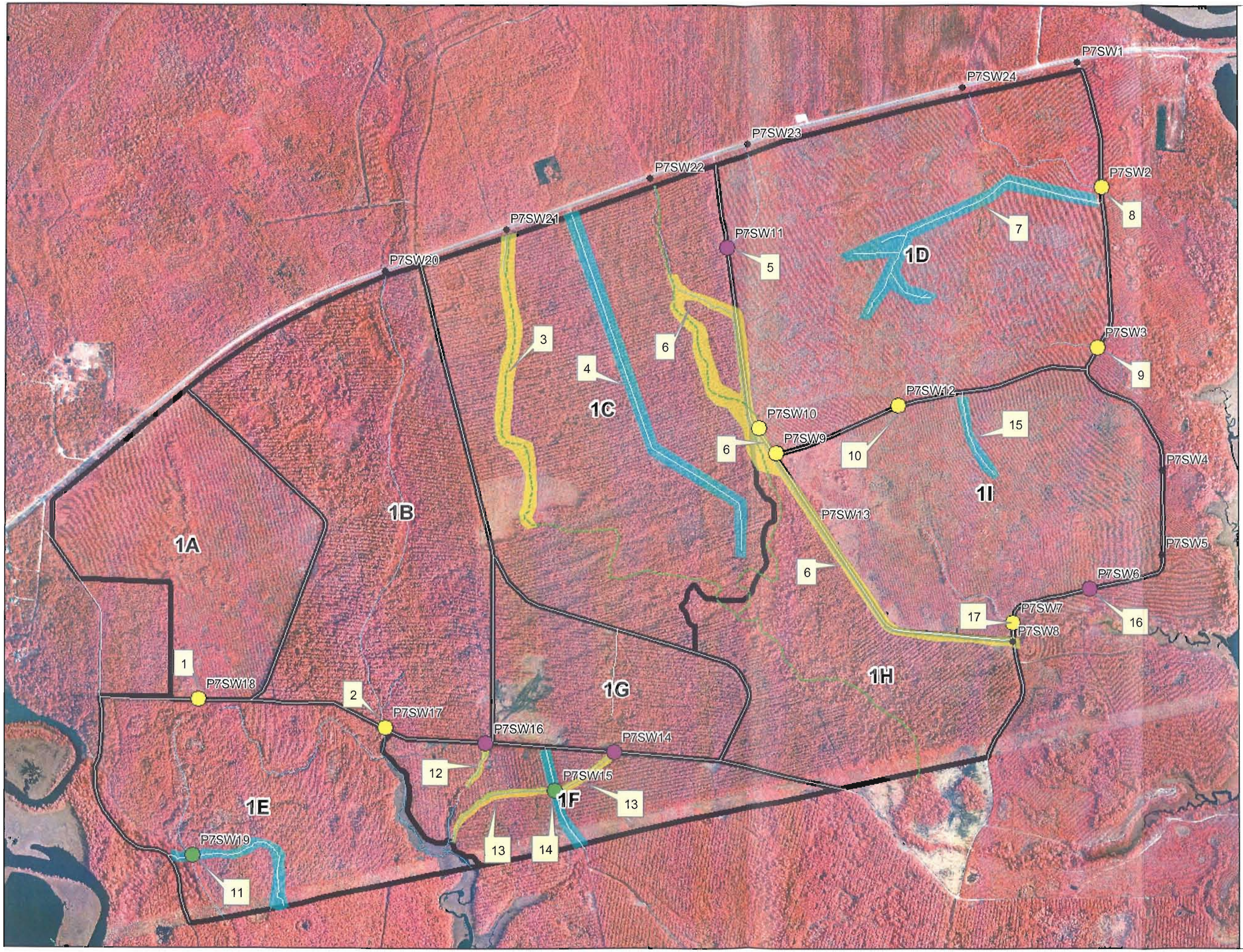


Panama City - Bay County International Airport Mitigation Plan

Figure D-1. Hydrologic Restoration

Mitigation Parcel 1

LEGEND

Road

Management Unit Boundary

Hydrologic Restoration Areas

FLUCFCS Type 510 - Streams and Waterways

Selected Historic Water Courses

Road Removal/Retirement Areas

Hydrologic Restoration Activity Area

Existing & Proposed Structures

Existing Structure - No Work Proposed

Existing Structure Removal

Low Water Crossing (LWC) Installation

New Pipe Installation

Clean pipe

Site Description Label

1 inch equals 1,000 feet

0 500 1,000 1,500 2,000 Feet

NOTES

PBSJ

Panama City - Bay County International Airport Mitigation Plan

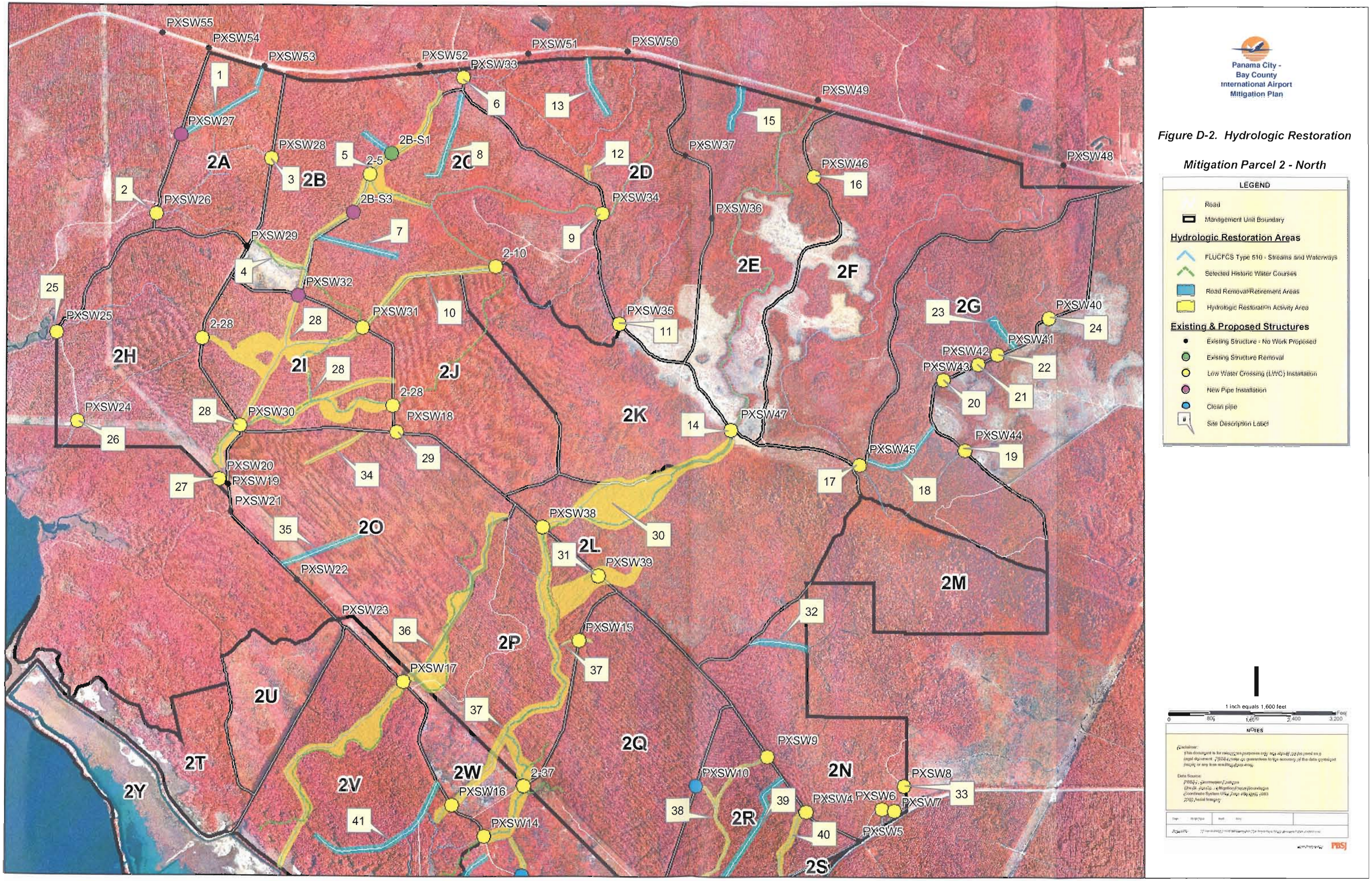


Figure D-2. Hydrologic Restoration Mitigation Parcel 2 - North

Panama City - Bay County International Airport Mitigation Plan

Figure D-3. Hydrologic Restoration

Mitigation Parcel 2 - South

LEGEND

- Road
- Management Unit Boundary

Hydrologic Restoration Areas

- FLUCFCS Type 510 - Streams and Waterways
- Selected Historic Water Courses
- Road Removal/Retirement Areas
- Hydrologic Restoration Activity Area

Existing & Proposed Structures

- Existing Structure - No Work Proposed
- Existing Structure Removal
- Low Water Crossing (LWC) Installation
- New Pipe Installation
- Clean pipe
- # Site Description Label

1 inch equals 1,600 feet

0 800 1,600 2,400 3,200 Feet

NOTES

Disclaimer:
This document is for reference purposes only and should not be used as a legal document. PBS&J makes no guarantees to the accuracy of the data contained herein or any loss resulting there from.

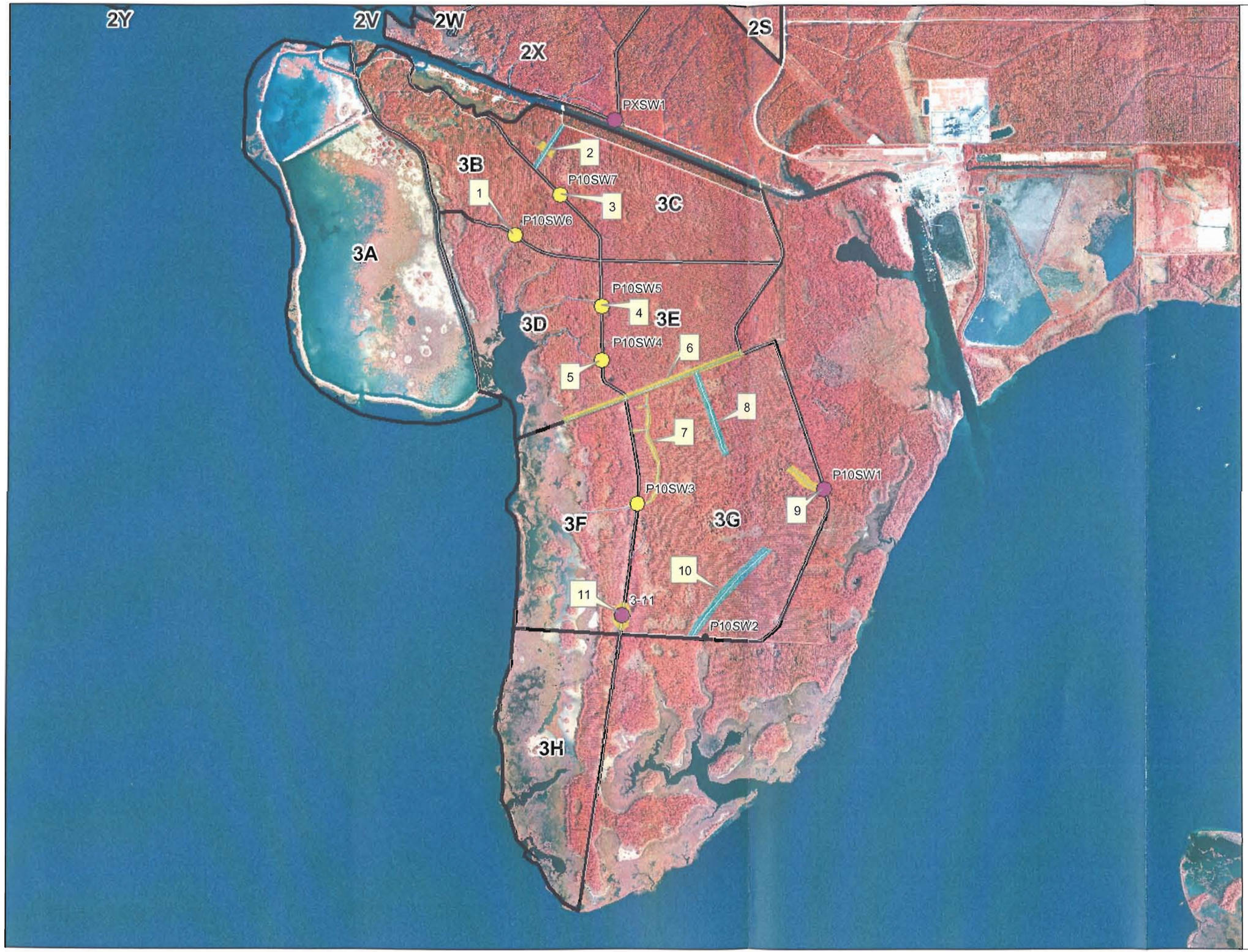
Data Source:
PBS&J - Stormwater Features
The St. Joe Co. - Mitigation Parcel Boundaries
Coordinate System UTM Zone 16N NAD 1983
2003 Aerial Imagery

Map Produced by PBS&J

Panama City - Bay County International Airport Mitigation Plan

Figure D-4. Hydrologic Restoration

Mitigation Parcel 3



LEGEND

- Road
- Management Unit Boundary

Hydrologic Restoration Areas

- FLUCFCS Type 510 - Streams and Waterways
- Selected Historic Water Courses
- Road Removal/Retirement Areas
- Hydrologic Restoration Activity Area

Existing & Proposed Structures

- Existing Structure - No Work Proposed
- Existing Structure Removal
- Low Water Crossing (LWC) Installation
- New Pipe Installation
- Clean pipe
- Site Description Label

1 inch equals 1,600 feet

0 800 1,600 2,400 3,200 Feet

NOTES

PBSJ