TECHNICAL STUDY
FOR THE
MILL POND IMPROVEMENT PROJECT

GEORGIA-PACIFIC'S FORMER SAWMILL FACILITY, FORT BRAGG, MENDOCINO COUNTY, CALIFORNIA

JANUARY 2006

PREPARED
BY

STETSON ENGINEERS INC.
San Rafael and Covina, California
Mesa, Arizona

TABLE OF CONTENTS

1.0 BACKGROUND **1**

1.1 General 1

1.2 Project Purpose 2

2.0 ENVIRONMENTAL SETTING **3**

2.1 Physiography and Drainage 3

2.2 Mill Pond and Dam 4

2.3 Mill Pond Hydrology 5

2.5 Mill Pond Habitat 6

3.0 PROJECT CONSTRAINTS **7**

4.0 PROJECT OPPORTUNITIES **8**

5.0 PROJECT CONCEPTS **9**

5.1 Criteria for Formulating Project Concepts 9

5.2 Descriptions of Alternative Project Concepts 10

6.0 PROJECT IMPLEMENTATION **14**

REFERENCES **15**

APPENDIX A: GEOTECHNICAL EVALUATION

APPENDIX B: HYDROLOGIC ANALYSIS

APPENDIX C: CAPACITY ANALYSIS FOR STORMWATER QUALITY ENHANCEMENT

APPENDIX D: SUMMARY NOTES OF MEETINGS WITH REGULATORY AGENCIES

TECHNICAL STUDY
FOR THE
MILL POND IMPROVEMENT PROJECT

1.0 BACKGROUND

1.1 General

Georgia-Pacific (G-P) is in the process of decommissioning its Fort Bragg Sawmill Facility (Sawmill Site) located along the coast in Mendocino County, California (Figure 1). The Sawmill Site covers about 445 acres which includes nine ponds that were historically used for a variety of industrial purposes (Figure 2); some are still used for on-site fire protection purposes. Mill Pond is the largest of these ponds covering approximately 7.3 acres.

The City of Fort Bragg (City) has initiated the Georgia-Pacific Sawmill Site Open Space Acquisition Project to acquire portions of the Sawmill Site, including Mill Pond, for coastal access, recreation, and other public purposes. If acquired for open space, there are issues associated with Mill Pond that would likely necessitate that it ultimately be improved. This technical study identifies feasible concepts for the necessary improvements (Mill Pond Improvement Project).

Improvements to Mill Pond would likely involve alterations to the dam or modifications to the pond. These activities would trigger the need for permits and approvals from several federal and state agencies. The State Department of Water Resources, Division of Safety of Dams (DSOD) Dams, under the California Water Code, regulates non-federal dams in California that meet certain size criteria[1]. DSOD has exerted jurisdiction over Mill Pond dam[2] and over the years has performed inspections of dam and prepared inspection reports. DSOD has expressed concern about the dam's condition and has directed Georgia-Pacific to make repairs. Georgia-Pacific has requested delaying repair until the future use of the dam has been determined (DSOD, May 2004). The U.S. Army Corps of Engineers regulates discharge of fill material into federal

---

[1] Dams under DSOD jurisdiction are non-federal artificial barriers, together with appurtenant works, which are 25 feet or more in height or have an impounding capacity of 50 acre-feet or more. Any artificial barrier not in excess of 6 feet in height, regardless of storage capacity, or that has a storage capacity not in excess of 15 acre-feet, regardless of height, is not considered jurisdictional. DSOD reviews plans and specifications for the construction of new dams or for the enlargement, alteration, repair, or removal of existing dams, under application, and must grant written approval before the owner can proceed with construction. DSOD must have issued a certificate of approval based upon the findings of its personnel, before water can be impounded behind a new dam or behind an existing dam which has been enlarged, altered, or repaired. These certificates may contain restrictive conditions and may be amended or revoked by DSOD.

[2] DSOD has determined that the dam height is 33 feet and the impounding volume capacity is 88 acre-feet, which falls within DSOD jurisdiction (DWR 1993).

jurisdictional waters under the federal Clean Water Act (Section 404), subject to the state's approval authority (under Section 401). The State Water Resources Control Board, through its

Regional Water Quality Control Boards, regulates discharges of any waste into state jurisdictional waters under the California Porter-Cologne Water Quality Control Act. The California Coastal Commission, under the federal Coastal Zone Management Act, has federal consistency review authority over Corps regulatory actions that affect coastal waters. The Commission also regulates discharges of fill into state jurisdictional waters under the California Coastal Act, and the City of Fort Bragg regulates under the Act's Local Coastal Program. The California Department of Fish and Game regulates alterations to state jurisdictional waters under the California State Fish and Game Code (Sections 1600 – 1616). Permits and approvals from these agencies would likely incorporate stringent design requirements, mitigation measures, and performance standards that could significantly influence the nature and extent of allowable improvements to Mill Pond.

1.2 Project Purpose

Georgia-Pacific and the City have identified multiple Project purposes:

- To eliminate potential geotechnical hazards related to Mill Pond Dam

  While detailed geotechnical and engineering analyses have not been performed, it appears that the Mill Pond dam may not meet structural and seismic safety standards and is in need of repair. DSOD has asked Georgia-Pacific to make repairs, and the City has concerns about potential safety and risk management issues which may be compounded by public access and intensified use of the beach and surrounding environs.

- To enhance stormwater quality

  Mill Pond is an important feature of the City's storm drainage system and it also will be an important drainage facility for the future development of the Sawmill Site. Mill Pond will need to continue to function as a stormwater quality enhancement facility.

- To provide public access, scenic and recreational amenities

  The Mill Pond area is slated for acquisition by the City for open space and has the potential to be a key scenic and public recreational amenity. Its current configuration, including a steep embankments and wood/timber walls along nearly the entire perimeter of the pond, are not optimal for public use.

- To restore and enhance wildlife life habitat

  Mill Pond is heavily choked with parrot's feather, a non-native invasive aquatic plant, which limits the pond's habitat value. In addition, the edges of the pond are either hardscape or steep and do not fully support typical native pond fringe vegetation. There is an opportunity to reduce invasive plant growth, restore native pond fringe vegetation, and provide substantially improved wildlife habitat.

2.0 ENVIRONMENTAL SETTING

2.1 Physiography and Drainage

Fort Bragg, California lies on an elevated terrace (at about elevation 100 feet) bounded on the north by Pudding Creek, on the south by the Noyo River, and on the west by the sea cliffs and rocky shoreline of the Pacific Ocean. Rainfall averages about 40 inches per year. The Fort Bragg terrace is drained by small watercourses that discharge to Pudding Creek or the Noyo River, or municipal storm drains that ultimately discharge to alluvial bottomlands or beaches. The terrace is overlain by marine terrace deposits, which consist of poorly consolidated sand, silt, gravel, and clay. The bedrock geology consists of sandstone, shale, and minor inclusions of volcanic rocks of the Franciscan Complex, which is exposed along the coastal bluffs.

The Sawmill Site covers about 445 acres of terrace and alluvial bottomland between Highway 1 and the ocean. About 80 percent of the Sawmill Site is covered with asphalt, crushed rock, or a mixture of both. Fort Bragg Landing Bay, also referred to as Soldier Bay, cuts into the rocky shoreline and terminates at a beach adjacent to an alluvial bottomland (Figure 3). Beyond the northern boundary of the Sawmill Site lie undeveloped land and the outlet of Pudding Creek. A landing strip and the City of Fort Bragg wastewater treatment plant lie to the south of Mill Pond.

The surface geology of the Sawmill Site is primarily artificial fill material consisting of sands with gravel, gravels with sand, and gravels to a depth of approximately 0-20 feet. Underlying the fill material are marine terrace deposits which consist of silty sands, sand, gravel with sand, and gravel. The marine terrace deposits vary in thickness across the site from 12 to greater than 70 feet. Underlying the marine terrace deposits are Franciscan sandstone and conglomerate bedrock. In the alluvial bottomland, alluvial material overlies lower elevation marine terrace deposits or, possibly, Franciscan bedrock.

The surface drainage of the Sawmill Site generally follows the topography towards the west. There are few well-defined surface drainage features or constructed stormwater facilities that concentrate the runoff; rather, runoff appears to generally flow in a distributed fashion. Some of the industrial ponds collect runoff from small, localized surrounding areas. Overflow from Ponds 1 - 4 spills into the southwestern corner of Mill Pond. A drainage area along the southeastern edge of the site near Maple Street collects localized surface runoff in a catch basin where a City storm drain also discharges. From the catch basin water is conveyed through a pipeline to Mill Pond. Another pipeline containing water collected from the City's Alder Street storm drain discharges into Mill Pond.

Depth to groundwater varies over the Sawmill Site, from as shallow as 1 foot below grade (fbg) in the alluvial bottomland to over 25 fbg on the terrace. Groundwater flow converges toward the alluvial bottomland, generally following the topography. A large seep occurs along the northern edge above the alluvial bottomland where groundwater daylights along the terrace.

2.2 Mill Pond and Dam

Sometime around 1885, after the Sawmill Site was originally developed, Mill Pond was formed by constructing an earthen dam along the terrace above the alluvial bottomland and on top of the rock comprising the edge of the coastal bluff. Apparently, a depression was excavated into the terrace behind the dam to provide additional storage capacity and Alder Creek was diverted into the pond that was formed. The dam has two concrete spillways set side-by-side along the coastal bluff -- an upper spillway and a lower spillway. The spillways discharge directly on to Soldier Bay beach and then into the ocean.

Mill Pond Dam consists of embankments along most of the pond perimeter. The dam appears to have been modified over the years and consists of a non-uniform assemblage of rock and debris, wood walls, timber crib walls, concrete retaining walls, and earthen berms. Along the coastal bluff on the west side of the pond, the embankment was constructed by placing fill material on top of exposed bedrock. Stacked concrete or timber crib walls were constructed in crevasses in the bluff to create a more resistant base for the overlying earthen fill. Fill material was deposited directly on top of the bedrock, or on top of the stacked concrete and crib walls. Along the north side, a wood wall was constructed with a fill embankment extending down to the alluvial bottomland. On the south and east sides, it appears that the pond was excavated into native soils, and a wood wall was constructed to retain the overlying slopes.

Based on a topographic/bathymetric map of the Mill Pond area, the lowest points in the pond are at approximately elevation 36 feet, and the two spillway crests are at approximately elevation 40.7 feet (upper spillway) and 39.3 feet (lower spillway). With the water level at the upper spillway crest the maximum pond water depth is 3.3 feet, and the pond covers about 7 acres and contains about 14 acre-feet of water.

A geotechnical study was performed to evaluate the condition of the dam and make preliminary recommendations for repairs (Appendix A, Geotechnical Evaluation). The study, based on visual inspection and assumed soil conditions (no soil testing was performed), found that the dam is potentially unstable, particularly along the coastal bluff. Soil investigations and laboratory strength tests would be required to provide a more accurate evaluation. The study presented options for stabilizing the dam, which include constructing a retention structure along the centerline of the dam, removing and rebuilding the dam, building a new interior dam, or excavating a deeper pond and lowering the dam.

2.3 Mill Pond Hydrology

Historically, Alder Creek drained central Fort Bragg and entered what is now the Sawmill Site from the east, dropping down onto the alluvial bottomland before discharging to Soldier Bay (Figure 4). After the Sawmill Site was developed, apparently Alder Creek was diverted into the constructed Mill Pond. Today Mill Pond is fed by two city storm drains, on-site surface runoff, and natural groundwater seepage. Historically, imported water pumped from G-P's Pudding Creek Reservoir and other on-site processing ponds has also been delivered to Mill Pond for industrial and fire prevention purposes. Beginning about three years ago, these imported water deliveries were reduced. Water exits the pond naturally through seepage and evapotranspiration. Except during dry periods, inflow exceeds natural outflow and water flows over the spillway onto Soldier Bay beach and the Pacific Ocean.

Two City storm drains, referred to as the Alder Street and the Maple Street pipelines, discharge along the eastern edge of Mill Pond via 36-inch reinforced concrete pipes. The source of the discharged water is stormwater runoff and groundwater seepage that infiltrates into the City stormwater network. The drainage basin for the Alder Street pipeline follows the approximate alignment of the historical Alder Creek encompassing approximately 104 acres consisting mainly of residential neighborhoods and business districts in the north-central portion of the City. The drainage basin for the Maple Street pipeline includes most central Fort Bragg encompassing approximately 130 acres consisting mainly of residential neighborhoods and commercial (Winzler & Kelly, 2004). Mill Pond also receives surface runoff from about 141 acres of the Sawmill Site consisting of distributed runoff, some of which collects in Ponds 1 - 4 and spills into the southwestern corner of the pond. In addition to surface inflow, Mill Pond is also probably fed by natural groundwater seepage directly entering the pond from surrounding areas.

Historical hydrologic records and approximations of imported deliveries were analyzed to evaluate the long term self-sustainability of Mill Pond relying solely on natural sources of inflow (Appendix B, Hydrologic Analysis). Analysis of these records and approximations found that during periods of normal rainfall natural sources are probably sufficient to sustain the pond year round. To test this hypothesis, during the summer of 2005 all artificial water deliveries to Mill Pond were terminated and the pond was left to rely solely on natural inflow from the Alder Street and Maple Street storm drains and groundwater seepage. The spillway was observed on nearly a daily basis from July through September. The pond remained full and water flowed continuously over the spillway at an estimated rate of about 30 gallons per minute throughout this period. Inflow was not measured so the contributions from the storm drains and groundwater seepage cannot be determined. Nonetheless, the summer 2005 observations support the likelihood that Mill Pond is self-sustainable during years of normal precipitation.[3] During dry periods, particularly during summers of prolonged droughts when groundwater levels decline and groundwater seepage directly into the pond and indirectly through infiltration into the Alder Street and Maple Street storm drains diminishes, the water level in Mill Pond could decline and imported water deliveries may be needed to sustain the pond.

2.5 Mill Pond Habitat

Mill Pond has an extensive coverage of emergent vegetation, with very little open water. The interior of the pond is almost completely covered by the invasive, non-native aquatic plant, parrot's feather *(Myriophyllum brasiliense).* Water parsley *(Oenanthe sarmentosa)* and cattail

(Typha latifolia) grow along the pond fringe – less where wood walls create a steep drop off and reduce the extent of the fringe.

Historically, Mill Pond has retained water year round for industrial and fire prevention purposes. Mill Pond provides habitat for fish, amphibians, invertebrates, and nesting, foraging and roosting habitat for a variety of avian species, particularly waterfowl. Species observed during a field assessment on March 13, 2003 included (TRC, 2003):

- Red-winged blackbird (*Agelaius phoeniceus*)-several breeding pair
- Mallard (*Anus platyrhynchos*) – several breeding pair
- American coots (*Fulica americana*) – several breeding pair
- Great egret (*Ardea alba*) – single bird foraging
- Belted kingfisher (*Ceryle alcyon*) – pair foraging
- Canada goose (*Branta canadensis*)

No threatened or endangered species were observed within or near Mill Pond.

[3] Precipitation records from the Desert Research Institute for station 043161 in Fort Bragg indicate that precipitation for 2005 totaled 36.82 inches. Average precipitation at this station is 40.89 inches for the period 1948 – 2004, so 2005 can be considered a "near normal" water year.

3.0 PROJECT CONSTRAINTS

The following are identified constraints that need to be factored into the design of improvements to Mill Pond:

- Conform to the conservation acquisition and open space framework

  A draft report of Preliminary Acquisition, Development, and Management Plan has been prepared by the City of Fort Bragg (City of Fort Bragg, 2004) for the Sawmill Site. Mill Pond improvements should generally conform to this conservation acquisition and open space framework (Figure 5).

- Provide adequate storage capacity for treatment of off-site and on-site stormwater runoff

  In the future, discharge from Mill Pond to the ocean will likely be subject to the requirements of the City's Municipal Storm Water Permit issued by the Regional Water Quality Control Board. Mill Pond improvements should retain and enhance its functionality to polish the stormwater in compliance with the future permit.

  In accordance with best management practices, the required pond volume for stormwater quality enhancement is estimated to be approximately 18 acre-feet assuming half of the developed Sawmill Site is built to drain to the pond based on the site topography (Appendix C, Capacity Analysis for Stormwater Quality Enhancement). The capacity of the existing pond at the crest of the lower spillway is about 14 acre-feet.

- Comply with applicable environmental regulations

  Improvements to Mill Pond will be subject to permits and approvals from several regulatory agencies, which would likely incorporate stringent design requirements, mitigation measures, and performance standards.

4.0 PROJECT OPPORTUNITIES

The following are identified opportunities to achieving the multiple purposes of the Mill Pond Improvement Project:

- Expand or enhance existing features of Mill Pond and nearby ponds

  The existing features of Mill Pond and/or other nearby ponds could be expanded or enhanced. Some of the ponds near Mill Pond could be restored to enhance habitat values and to contribute to the needs of stormwater treatment. If Mill Pond were to be retained, either entirely or in a smaller footprint, the edges of the pond could be enhanced by grading and re-contouring the slopes and planting native pond fringe and upland vegetation.

- Control non-native invasive plant species

  Parrot's feather is a non-native invasive aquatic plant found throughout the north coast area. It can choke shallow freshwater lagoons. While herbicide treatments are available, it frequently returns after treatment and long-term maintenance is difficult. However, if water depths are greater than 5 feet or the pond is brackish or saline, it will not become a serious problem. Therefore, any design for pond improvement should include measures to prevent recurrence of parrot's feather.

- Re-create historical riparian corridors and wetland in the alluvial bottomland

  Riparian corridors along Alder Creek and other watercourses probably occurred years ago before the Sawmill Site was originally developed. The alluvial bottomland probably supported a wetland during pre-development times as well. Shallow groundwater and the historical Alder Creek alluvial channel, now probably buried, would have been conducive to creating a sustainable pond and wetland environment. Re-creation of historical riparian corridors and the alluvial bottomland wetland with native emergent vegetation and upland buffer zones is possible. Removing the Soldier Bay beach berm would restore the historical tidal connection with the alluvial bottomland wetland.

- Use treated wastewater as a backup source of freshwater

  The City of Fort Bragg municipal wastewater treatment plant is located just south of Mill Pond. It is possible that with sufficient treatment to meet stringent water quality and public health standards some of this water could be recycled to provide make-up freshwater as needed to sustain the pond and wetland during extended dry periods.

5.0 PROJECT CONCEPTS

5.1 Criteria for Formulating Project Concepts

Conceptual designs for the Mill Pond Improvement Project have been formulated that achieve all of the multiple purposes of the Project while complying with the constraints and drawing on the opportunities described above. Each design is feasible from the standpoint of constructability, sustainability, and regulatory compliance. The table below summarizes design measures employed in each concept to achieve the multiple project purposes.

Purpose:	Design Measure:
Eliminate geotechnical hazards	Incorporate stabilization measures (as per Appendix A, Geotechnical Evaluation), or fill the pond.
Low maintenance and sustainability	Install simple mechanical devices to intercept trash and debris where City storm drains discharge to the pond; make full use of natural sources of surface and groundwater inflow to sustain pond and wetland hydrology.
Stormwater quality enhancement	Intercept trash and debris at inflow points; provide a stormwater detention volume of at least 18 acre-feet (Appendix C, Capacity Analysis for Stormwater Quality Enhancement).
Public access, scenic opportunities	Allow for public access and pathways by providing buffers surrounding improved areas; eliminate steep embankments and wood/timber walls along the pond perimeter.
Wildlife habitat enhancement	Improve habitat by deepening the pond to inhibit growth of parrot's feather; regrade the shoreline to enlarge the pond fringe.
Regulatory compliance	Mitigate for impacts to jurisdictional waters at a ratio of 1:1 (Appendix D, Summary of Meetings with Environmental Regulatory Agencies). For purposes of determining mitigation requirements for ponds that are impacted, the following jurisdictional acreages been used (per WRA, 2005)[4]:

[4] Based on California Coastal Commission ESHA areas.

TABLE 1
ACREAGES OF JURISDICTIONAL WATERS

Jurisdictional Water	Acreage/Length
Pond 1	0.46 ac
Pond 2	0.77 ac
Pond 3	1.50 ac
Pond 4	0.10 ac
Pond 5	0.58 ac
Pond 6	0.17 ac
Pond 7	0.10 ac
Pond 8	7.29 ac
Pond 9	0.71 ac
Pond E	0.06 ac
Seep	0.30 ac
Wetland	5.78 ac
Drainage	0.16 ac and 1,227 ft

Source: WRA, 2005

For mitigating impacts to jurisdictional waters by re-creating the historical wetland in the alluvial bottomland, it has been assumed that construction of a wet meadow wetland would be favored over a coastal lagoon for several reasons. These include less maintenance, less potential impact on endangered steelhead, and a higher probability of self-sustainability and overall success.

The two project purposes that have the most influence on the nature and extent of the improvements to Mill Pond are stormwater quality enhancement and elimination of geotechnical hazards. Stormwater quality enhancement sets the requirement for minimum size of the stormwater pond: Using a required detention volume of 18 acre-feet and a minimum average depth of 5 to 8 feet to prevent parrot's feather, then about 2 to 4 acres are needed for the stormwater pond. Elimination of geotechnical hazards bears on the impacts to Mill Pond, which in turn influences the amount of stormwater detention volume that needs to be made-up and the amount of mitigation that needs to be provided. Acceptable stabilization measures include filling the pond, or stabilizing the dam using the "new interior embankment dam" and the "embankment modification" methods (per Appendix A, Geotechnical Evaluation) – the "structural retention" and "rebuild existing embankment" options have been eliminated from further consideration due to uncertainties about desirability, feasibility, and cost.

5.2 Descriptions of Alternative Project Concepts

Three general categories of conceptual designs have been developed that cover the range of feasible options. Each concept has variants.

Concept 1 – Retain Existing Pond Configuration

Concept 1 has two variants, 1a and b. The conceptual design for Concept 1a is shown in Figure 6. Key elements include:

- Stabilize the dam using "embankment modification" method lowering it from el. 44 feet down to el. 38 feet (Appendix A, Geotechnical Evaluation, p. 9 and Figure 10)
- Construct a new spillway at el. 35 feet and low-level outlet
- Excavate the pond down to el. 29 feet to create stormwater capacity and prevent parrot's feather
- Modify the inlet structures to conform to the modified pond configuration, prevent erosion, and contain trash and debris
- Re-grade and re-contour the banks and shoreline of the pond to add 50 feet of emergent wetland fringe for habitat enhancement and stormwater quality improvement
- Repair or remove the cribwall

The conceptual design for Concept 1b is shown in Figure 7. Concept 1b is similar to 1a, except that the stabilization method is the "new interior embankment" method (Appendix A, Geotechnical Evaluation, p. 8 and Figure 9). Removal or repair of the cribwall would not be necessary.

Concept 2 – Remove Dam and Partially Fill Pond

Concept 2 has three variants. The conceptual design for Concept 2a is shown in Figure 8. Key elements include:

- Fill the western part of the pond
- Excavate the remaining part of the pond down to el. 35 feet to create stormwater capacity and prevent parrot's feather
- Install a new spillway to el. 41 feet and low-level outlet with stilling basin and construct a culvert through the beach berm or remove the beach berm
- Modify the inlet structures to conform to the modified pond configuration, prevent erosion, and contain trash and debris
- Mitigate for the pond filling by excavating, planting and re-creating 2.7 acres of wet meadow with riparian corridor in the alluvial bottomland

Alternative 2a Mitigation Summary

Loss	Gain
-2.7 ac for lost pond area (filling)	+2.7 ac for created wetland

Concept 2b, shown in Figure 9, is similar to Concept 2a but it provides expanded habitat enhancements, which include:

- Re-grade/re-contour the banks and shoreline of the pond to add 50 feet of emergent wetland fringe for habitat enhancement and stormwater quality improvement
- Demolish and remove the spillway, remove the dam and re-grade down to the rocks
- Remove the wood wall and re-grade/re-contour the embankment along the northern side of the pond down to the alluvial bottomland
- Construct a pipeline to redirect the Alder Street storm drain to discharge into the Maple Street catch basin
- Construct a spillway with low level outlet at the Maple Street catch basin
- Create a stream channel with riparian corridor to convey outflow from the Maple Street catch basin to Mill Pond
- Remove the beach berm and re-grade to join Soldier Bay beach

Alternative 2b Mitigation Summary

Loss	Gain
-2.7 ac for lost pond area (filling)	+2.8 ac for created wetland
-0.1 ac for lost Pond 1 area	
-2.8 ac	+ 2.8 ac

Concept 2c, shown in Figure 10, is similar to Concept 2b except that it moves the stormwater quality enhancement function from Mill Pond to the Maple Street catch basin where a new stormwater pond is created. This necessitates additional mitigation to compensate for about 5.9 acres of lost wetland drainage in the catch basin, which is achieved by expanding the created wet meadow in the alluvial bottomland and crediting the stream/riparian corridor and wetland fringe around Mill Pond.[5]

Alternative 2c Mitigation Summary

Loss	Gain
-2.7 ac for lost pond area (filling)	+5.54 ac for created wetland
-0.1 ac for lost Pond 1 area	+1.7 ac for riparian corridor
-5.78 ac for lost wetland	+1.5 ac for Pond 8 fringe
-2.7 ac for lost Pond 8 area (filling)	
-0.16 ac for lost drainage	
-8.74 ac	+ 8.74 ac

[5] The Regional Water Quality Control Board would not credit the created stream channel/riparian corridor and the 50 foot wetland fringe around Mill Pond toward mitigation for the loss from filling Mill Pond because, in Concept 2b, these features receive stormwater *before* treatment. On the otherhand, in Concept 2c, these features receive stormwater *after* treatment at the converted Maple Street pond and, consequently, would be credited toward mitigation.

Concept 3 – Remove Dam and Completely Fill Pond

Concept 3 has two variants, 3a and b. The conceptual design for Concept 3a is shown in Figure 11. Key elements include:

- Fill the entire pond
- Construct a new stormwater pond at the Maple Street catch basin
- Extend the Alder Street storm drain to discharge to the new Maple Street stormwater pond
- Mitigate for the filling Mill Pond and loss of the Maple Street catch basin by (a) excavating, planting and creating a 5.8 acre stream channel/riparian corridor extending from the new Maple Street stormwater pond to the coastal lowland; and (b) excavating, planting and creating 7.4 acres of wet meadow in the coastal lowland
- Construct a culvert through the beach berm
- Remove the dam and re-grade down to the rocks
- Repair or remove the cribwall
- Remove beach berm and re-grade

Alternative 3a Mitigation Summary

Loss	Gain
-7.3 ac for lost Pond 8 area (filling)	+7.4 ac for created wetland
-5.78 ac for lost wetland	+5.8 ac for riparian corridor
-0.16 ac for lost drainage	______________________
-13.2 ac	+13.2 ac

Concept 3b is similar to 3a, except that the new stormwater pond is constructed at Pond 5, which necessitates 0.6 acres of mitigation to compensate for the lost Pond 5 area. This mitigation is accomplished by increasing the area of the created wet meadow wetland in the coastal lowland. The conceptual design for Concept 3b is shown in Figure 12.

Alternative 3b Mitigation Summary

Loss	Gain
-7.3 ac for lost Pond 8 area (filling)	+7.2 ac for created wetland
-0.6 ac for lost Pond 5	+0.7 ac for riparian corridor
-0.16 ac for lost drainage	______________________
-7.9 ac	+7.9 ac

6.0 PROJECT IMPLEMENTATION

Implementation of the Mill Pond Improvement Project can occur in three phases: Phase 1, preliminary design and environmental regulatory compliance; Phase 2, final design; and Phase 3, construction. Following is a bulleted list of key activities and milestones for Phase 1.

- For purposes of NEPA and CEQA compliance, prepare a Project Description, Statement of Purpose and Need, and define the Project area.
- Prepare a protocol level delineation of jurisdictional waters within the Project area and submit to the Corps and CCC for written verification.
- Review existing biological and cultural resources surveys, conduct supplemental protocol level surveys within the Project area and surrounding affected areas as needed. These surveys should determine the presence or absence of any plant or animal species afforded special protection under the State and Federal law, as well as cultural resources. Prepare biological and cultural resources assessment reports to support environmental regulatory compliance.
- Prepare a detailed engineering feasibility study that formulates and analyzes Project alternatives. Each alternative should meet the stated purpose and need, comply with permitting and mitigation requirements of all agencies, be compatible with pollution cleanup activities, and meets (pending) RWQCB NPDES stormwater permit requirements. At least one alternative should be developed that avoids or at least minimizes impacts to jurisdictional waters and all alternatives. The feasibility study should analyze the Project alternatives in accordance with EPA 404(b)(1) Guidelines and CCC guidelines, select a preferred alternative, and provide feasibility-level design and costs for the preferred alternative.
- Prepare a single Project Description document for the selected preferred alternative Project that is suitable for all agencies. Complete specialized application forms for each agency, attach the Project Description document to each specialized application form, and submit to the agencies along with appropriate fees.
- Prepare CEQA documentation (City is Lead Agency).
- City adopts CEQA finding.
- CDFG issues SAA.
- RQWCB issues 401 certification or waiver.
- City issues CDP.
- After all State permits are issued, Corps completes NEPA and prepares FONSI (assuming EA/FONSI are appropriate), and issues permit.
- Prepare final design.
- Construct.

REFERENCES

City of Fort Bragg, 2004. Preliminary Acquisition, Development & Management Plan.

Department of Safety of Dams, 2004. DSOD Inspection Report.

TRC, 2003. Jurisdictional Determination and Habitat Assessment.

Winzler &Kelly, 2004. Storm Drainage Master Plan, City of Fort Bragg.

WRA, 2005. Assessment of Environmentally Sensitive Habitat Areas.