Public Notice

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Date: April 5, 2002
Comments Due: May 3, 2002

US Army Corps of Engineers

Sacramento District
1325 J Street
Sacramento, CA 95814-2922

In reply, please refer to the Public Notice Number

TO WHOM IT MAY CONCERN:

SUBJECT: Application for a Department of the Army permit under authority of Section 404 of the Clean Water Act and water quality certificationunder Section 401 of the Clean Water Act to excavate and place fill in wetlands in order to construct the Logan City Effluent Polishing Wetlands project. The City of Logan, Utah, proposes to construct a series of six treatment wetland cells for the purpose of polishing the quality of water discharged from the municipal water treatment facility. The entire system will consist of an inlet pond, a four screw pumping system, a conveyance system, in addition to the wetland cells, and an outfall structure to the Swift Slough. Construction, excavation, and placement of fill will impact approximately 9.71 acres of jurisdictional wetlands.

APPLICANT: City of Logan, Utah
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LOCATION: The project area for the Logan City Effluent Polishing Wetlands project is located 2.7 miles west of Logan, Utah (Figure 1). It is located within the watershed of Swift Slough, less than 1 mile upstream of its confluence with the Cutler Reservoir. The project area includes all or portions of the NE1/4, the NW1/4, and the SW 1/4 of Section 24, Township 12 North, Range 1 West (Salt Lake Meridian) in Cache County, Utah. (UTM coordinates 424,600M E; 4,624,500M N; Z 12; NADD 27)

PURPOSE: To improve the quality of the water discharged from the City of Logan municipal water treatment facility. At the present time, the concentrations of ammonia in the effluent from the water treatment facility average 11 mg/l, which is in excess of Utah state water quality standards. The polishing wetlands are expected to provide the capacity to remove sufficient ammonia from the water to reduce concentrations in water leaving the polishing wetlands to 3.2 mg/l during the growing season when plants are active and to 3.8 mg/l during the dormant season. This reduction in ammonia

concentrations will allow the City of Logan to satisfy the requirements of their Utah Pollution Discharge Elimination System (UPDES) Permit.

PROJECT DESCRIPTION: At the present time, effluent from the municipal water treatment facility is discharged from the lagoons at the municipal water treatment facility into a ditch, which conveys the water to the northwest and into another ditch on the east side of the Benson Road (Figure 1). From there, the water flows along the east side of the Benson Road to a confluence with flows from Blue Springs. From that confluence, the combined flows are conveyed to the west in a ditch to discharge into Cutler Reservoir. During the growing season, a substantial portion of those flows are diverted from the effluent stream to irrigate pastures in the vicinity. Three sample points for monitoring water quality have been established along the ditches conveying the effluent stream between the outlet from the lagoons and the discharge point into the reservoir (Figure 1).

With implementation of the Effluent Polishing Wetlands project, the effluent from the water treatment facility will follow the current path to the point of confluence with flows from Blue Springs. At that confluence, the effluent stream will cross under Blue Springs Creek in a pipe in order to be delivered to the southwest corner of the project area located to the north (Figure 1). A diagram of the crossing is included in Appendix A of this document. Irrigation uses of the water will remain the same as currently required by water shares in the Logan Cow Pasture Irrigation Company. Additional water sample points will be established at 12 points within the project wetlands to allow for monitoring of water quality before, during, and after treatment by the wetlands (Figures 1 and 2).

Upon delivery of the effluent from the municipal water treatment facility to the southwest corner of the project, it will pass through the inlet pond (Figure 2). The inlet pond will serve two purposes. The first purpose will be to allow sedimentation of particulates from the effluent. The inlet pond will dissipate the energy from the water as it enters, slowing the velocity of flow to allow deposition of sediment and other particulate material. The second purpose of the inlet pond will be to provide a stilling area for the water prior to its entering the pump system. The inlet pond will be excavated to 10 feet and will surrounded by a dike one to three feet high and a fence. The pond will be characterized by open water up to six feet deep.

The pump system will consist of up to four screw pumps installed in a concrete structure. The conveyance system from the screw pump station to the top of the wetland cells will consist of a pipe. The slope and size of the pipe have been designed to maintain a flow velocity of less than one foot per second. The pump and conveyance system will transport the water from the inlet pond to the southeast corner of the project area, where it will be discharged into the first of the wetland cells (Figure 2).

The wetland system will include six wetland cells, separated by dikes twelve feet wide, with gravel access roads on top of the dikes. A dike will also be constructed around the entire wetland system. The highest elevation wetland cell is located on the east end of the project area and the lowest elevation wetland cell is location on the west end (Figure 2). Each cell will provide approximately 4,200 lineal feet of meandering

channel with a design depth of two feet. Water will enter each cell in the southeast corner of the cell and will exit from each cell in the southwest corner of the cell. A berm will be constructed in the center of each cell to prevent short-circuiting of flows from inlet to outlet. Flows through each cell will be maintained at velocities less than one foot per second. A deeper pool will be constructed within each channel just prior to the outlet from each cell to assist in the nitrification/denitrification process (as described in Appendix B).

For maintenance purposes, each cell will be provided with a diversion channel that connects the southeast corner of the cell with the southwest corner of the cell (Figure 2). A concrete structure will be constructed in the southeast corner of each cell to allow diversion of water into either the diversion channel or the following wetland and to control the water level in the preceding wetland cell. Each concrete structure will include an adjustable weir to be used for water level control and gates to be used to direct the water into either the diversion channel or the following wetland.

The two foot deep meandering channel in each cell will be 20 feet wide. Near the outlet of each cell will be constructed a deeper (up to four feet deep) open water area that will be partially vegetated with marsh vegetation (Figures 3 and 4). In addition, a freshwater marsh area approximately 400 feet wide will be planted adjacent to the channels that will be subject to water depths from four inches to 1 foot. The marsh areas will be planted with hardstem bulrush (*Scirpus acutus*) and cattails (*Typha latifolia*), with the cattails planted at lower densities due to the tendency of this species to outcompete other species and eventually dominate mixed stands of vegetation. Wet meadow vegetation will be established immediately upslope of the marsh and will include plant species such as Nebraska sedge (*Carex nebrascensis*), Baltic rush(*Juncus arcticus*), swordleaf rush (*Juncus ensifolius*), alkali bulrush (*Scirpus maritimus*), and common threesquare bulrush (*Scirpus pungens*) (Figures 3 and 4). Upland grasses will be planted within areas on the perimeters of the cells and at the highest elevations within the cells. Trees will be scattered throughout the higher elevation portions of the project wetland cells, including cottonwoods (*Populus* spp.), and willows (*Salix* spp.). Wet meadow and marsh vegetation will also be established within mitigation wetland areas to be constructed within existing upland areas in the southwest corner of the project site (Figures 3 and 4). Acreage of the different cover types to be established are listed in Table 1.

TABLE 1 **Cover types within the completed Logan City Effluent Polishing Wetlands project.**	
Open channels and ponds	41.06 acres
Freshwater marsh	36.0 acres
Wet meadow	90.71 acres
Upland, including roads and project facilities	72.23 acres
TOTAL	**240 acres**

After flowing through the wetland cells, the effluent stream will be discharged into Swift Slough via an outfall structure. The maximum flow to be released to Swift Slough is anticipated to be 21 cubic feet per second.

Information regarding operation of the polishing wetlands, the water balance of the wetland system, and the physical and biological processes by which contaminants will be removed from the effluent is included in Appendix B of the permit application..

AREA DESCRIPTION: The project area consists of 240 acres of relatively flat pasture (Figure 5). Swift Slough cuts across the northwest corner of the project area in an incised channel. A shallow tributary swale to Swift Slough is oriented approximately parallel to the northern boundary of the project area and an abandoned railroad grade crosses the southwest corner of the project area in a southeast/northwest orientation.

Existing Plant Communities and Wildlife Habitat - The pasture north of the abandoned railroad grade (Figure 5) supports a mixture of alfalfa (*Medicago sativa*), upland grasses such as bromegrass (*Bromus* spp.), bluegrasses (*Poa* spp.), and timothy (*Phleum pratense*), orache (*Atriplex heterosperma, A. rosea*), prickly lettuce (*Lactuca serriola*), and other upland forbs. Within the southwestern portion of the pasture north of the railroad grade, patches of slender seepweed (*Suaeda calceoliformis*), dock (*Rumex* spp.), summer cypress (*Kochia scoparia*), and orache occur on salt-encrusted soils. Elsewhere within the pasture north of the railroad grade are patches dominated by foxtail barley (*Hordeum jubatum*) and Mediterranean barley (*Hordeum geniculaturm*). A visible linear pattern in the vegetation indicates that this pasture has been seeded in the past. Areas identified as jurisdictional wetlands within this pasture are restricted to the Swift Slough channel, the lower reaches of its tributary swale, and an excavated borrow area adjacent to the abandoned railroad grade (Figure 6).

The pasture south of the abandoned railroad grade (Figure 5) supports a mosaic of wet meadow vegetation dominated by sedges (*Carex* spp.) and rushes (*Juncus* spp.),

surrounding convex positions supporting either a relatively uniform stand of tall wheatgrass (*Agropyron elongatum* or *Elymus elongatus*) or a mixture of upland grasses and forbs similar to the pasture north of the railroad grade. The wet meadow area drains toward the west via a shallow swale dominated by sedges and teasel (*Dipsacus sylvestris*). The wet meadow portion of the pasture south of the abandoned railroad grade has been identified as a jurisdictional wetland area (Figure 6).

The entire project area has been subject to grazing by cattle and it appears that the pasture north of the abandoned railroad grade has been harvested for hay. The condition of the vegetation in the pastures reflects these uses. By the end of the growing season, most of the plant material has been removed by mowing or grazing and little standing dormant vegetation remains to provide cover within the project area, with the exception of marsh vegetation in the borrow area adjacent to the railroad grade and stands of tall wheatgrass within the upland portions of the pasture south of the railroad grade. The wet meadow portions of that pasture are hummocky due to the effects of livestock trampling on wet soils.

The condition of the project area affects its value as wildlife habitat. As mentioned previously, cover for pheasants and other wildlife is reduced by the end of the growing season to marsh vegetation in a narrow band along the railroad grade and stands of tall wheatgrass in the southwest corner of the project area. The project area north of the abandoned railroad grade is mowed or heavily grazed and provides habitat primarily for small mammals, as well as hunting grounds for their predators, such as red fox, raptors, striped skunks, snakes, etc. Geese and other waterfowl may also use the pasture for grazing. The pasture north of the railroad grade is not flood-irrigated, so the short stature vegetation in that area is not useful for feeding by shorebirds. The wet meadow vegetation in the pasture south of the railroad grade is characterized by long-term soil saturation or shallow inundation and may provide foraging and/or nesting habitat for shorebirds and waterfowl. Habitat quality is limited, however, by the effects of heavy grazing and trampling by livestock.

Swift Slough conveys perennial flows and provides potential habitat for fish and amphibians, but cover along the streambanks is limited to a narrow band of herbaceous vegetation. This stream is a tributary to Cutler Reservoir, which is classified as a warm water recreational fishery. Two small stands of willow trees provide perches for raptors and potential nest sites for other birds, which is a relatively limited resource in the vicinity of the project area. No raptor nests are present in the trees within the project area or in the vicinity of the project area. A magpie nest is located in the small stand of trees adjacent to Swift Slough.

Wetland Delineation and Identification of Existing Wetlands - Five areas qualifying as jurisdictional wetlands, including 25.68 total acres, were identified within the project area for the Logan City Effluent Polishing Wetlands (Figure 6). Those areas include wet meadow wetlands along the Swift Slough channel (0.18 acre of open channel + 0.35 acre of riparian wet meadow), wet meadow wetlands along the tributary to Swift Slough (3.2 acres), a borrow ditch adjacent to the abandoned railroad grade that supports marsh wetlands (2.22 acres), a broad wet meadow area dominated by sedges and rushes (19.67 acres), and a small wet meadow area adjacent to the

Benson Road that supports mostly rushes (0.06 acre). These wetland areas are described in detail in the wetland delineation report, which is included in Appendix C.

The wetlands associated with the Swift Slough channel provide streambank stabilization, filtration of sediments and uptake of nutrients from runoff into the stream, and export of primary production to the aquatic system, limited by the narrow width of the floodplain area along the incised channel. The narrow width of the wetlands relative to the size of the channel also limits their ability to provide nutrient uptake or sediment filtration functions to the water in the channel itself. The incised nature of the channel precludes any desynchronization of floodflows by the wetlands, but it is likely that some groundwater discharge to the channel occurs, particularly when the water table is elevated in the spring. With perennial flows, Swift Slough provides some aquatic habitat, although the herbaceous vegetation in the wetlands along the channel does not provide very much cover to the channel itself.

The wet meadow wetlands associated with the tributary to Swift Slough provide many of the same functions and values as the wetlands along the Swift Slough channel, but not on a year-round basis since flows in the tributary are likely only during spring snowmelt and possibly after an unusually large precipitation event. During such rare flow events, the wetlands provide soil stabilization, filtration of sediments and toxicants, and retention and uptake of nutrients. By slowing flows into Swift Slough, the wetlands in the tributary also provide floodflow desynchronization and possible groundwater recharge during flow events. Groundwater discharge is less likely since the tributary channel is not deeply incised and not likely to intercept the water table. Since flows are intermittent or seasonal in the tributary, the associated wetlands do not provide aquatic habitat but do provide increased primary production relative to the surrounding upland pasture. All of these wetland functions and values are limited by the impacts of livestock grazing, which reduces the stature and biomass of the vegetation within the wetlands to such an extent that the wetlands are almost indistinguishable from the surrounding upland plant communities.

The borrow ditch along the abandoned railroad grade receives tailwater flows from flood irrigation and irrigation ditches in adjacent fields. The wetlands provide soil stabilization, nutrient uptake and transformation, and sediment retention functions during flow periods when water discharges from the borrow ditch into the roadside ditch. The taller stature of the marsh vegetation in the borrow ditch relative to the surrounding pastures provides structural habitat diversity for nesting birds and terrestrial wildlife, although the relatively small size and narrow configuration of the marsh wetlands limits their habitat value for the larger species. The long-term inundation of the wetlands likely provides habitat for semi-aquatic species, such as amphibians, and the long-term availability of water in these wetlands supports greater primary production than the surrounding pastures.

The wet meadow wetlands south of the abandoned railroad grade apparently provide groundwater recharge and discharge functions, depending on the seasonal elevation of the water table relative to the ground surface. Since flows onto the project area through these wetlands is dispersed over a broad area instead of conveyed in a channel, the wetlands function to desynchronize floodflows. Slow flows through the

wetlands also allow for effective soil stabilization, nutrient uptake and transformation, and sediment/toxicant retention, although the soil disturbance due to livestock trampling and the contribution of nutrients associated with animal waste deposited in the wetlands likely reduces the efficacy of those functions. Abundant water available to the wetlands supports greater primary production than surrounding uplands, although grazing substantially reduces the resulting biomass. The sedge/rush plant community and shallow inundation characteristic of the wetland also provide feeding and nesting habitat for specific wildlife species, including shorebirds and some waterfowl.

Total Area of Direct or Indirect Impacts to Waters of the U.S., Including Wetlands - The direct impacts to wetlands of the proposed Logan City Effluent Polishing Wetland project will include the discharge of fill material into 0.14 acre of marsh wetlands and 4.9 acres of wet meadow wetlands. The project will also result in the excavation of 0.78 acre of marsh wetland and 3.55 acres of wet meadow wetlands, as well as other construction impacts to 0.34 additional acres of wet meadow wetlands. Total direct impacts to wetlands within the project area will include 9.71 acres of excavation, fill, and related construction impacts. (Figures 7 & 8). Wetland areas to be impacted by excavation or fill associated with the project include the tributary to Swift Slough, the borrow ditch adjacent to the abandoned railroad grade, and the sedge/rush wet meadow in the pasture to the south of the abandoned railroad grade. The Swift Slough channel and associated wetlands will be affected by the construction of an outfall structure at the outlet from the wetland cells (see diagram in Appendix A) and by increased flows due to the discharge of the treated effluent from the northwest corner of the polishing wetlands into Swift Slough. Wetlands that will remain unaffected by the project include those associated with the isolated swale to the west of the Swift Slough channel and most of the sedge/rush wet meadow wetlands located south of the abandoned railroad grade. Acreage of wetland impacts associated with the project are listed in Table 2.

TABLE 2
Wetland impacts associated with the Logan City Effluent Polishing Wetlands project (acres).

Wetland area	Wetland type	Excavation impact area	Fill impact area	Total impact area	Undisturbed wetland area
Swift Slough channel	Perennial channel	0	<<0.01	<<0.01	0.18
Swift Slough banks	Wet meadow	0	<<0.01	<<0.01	0.35
Tributary to Swift Slough	Wet meadow	0.38	2.48	2.86 (+0.34*)	0.0*
Isolated swale	Wet meadow	0.0	0.0	0.0	0.06
Sedge/rush meadow	Wet meadow	3.17	2.42	5.59	14.08
Borrow ditch	Marsh	0.78	0.14	0.92	1.3
TOTAL	**ALL WETLANDS**	**4.33**	**5.04**	**9.71**	**15.97**

* likely to be impacted by construction activities due to contiguity with excavated and filled areas

A total of 9.37 acres of jurisdictional wetlands within the project area, including 0.92 acre of marsh wetlands and 8.45 acres of wet meadow wetlands, will be directly impacted by fill or excavation during the development of the project wetland cells and other facilities (Figures 7 & 8). In addition, it is likely that the remaining 0.34 acre of wet meadow wetland within the tributary to Swift Slough that will be neither excavated nor filled will be impacted by other construction activities due to the contiguity of the wetlands along the tributary swale. As a result, the total acreage of direct impacts to wetlands is anticipated to include 0.92 acre of marsh wetlands and 8.79 acres of wet meadow wetlands for a total impact acreage of 9.71 acres.

At the present time, the Logan Cow Pasture Irrigation Company owns water rights on most of the effluent from the municipal water treatment facility which are used to water pastures to the west of the project area. Operation of the polishing wetlands will not interfere with the delivery of water associated with current water rights during the growing season so no indirect impacts of the Logan City Effluent Polishing Wetlands project on those wetlands is anticipated. Water discharging from the project into Swift Slough will enter Cutler Reservoir slightly downstream from the Blue Springs Creek confluence where all of the effluent from the water treatment facility currently enters the reservoir. This change in discharge point is not anticipated to result in any indirect impacts to the wetlands associated with the reservoir since the water level supporting those wetlands is controlled and stabilized by the operation of Cutler Dam.

The project is anticipated to provide indirect benefits to the existing wetlands associated with Swift Slough. Because of the incised topography of the slough, the wetlands associated with Swift Slough are currently limited in extent. The wetlands constructed by the Logan City Effluent Polishing Wetlands project will provide extensive wetland habitat adjacent to and contiguous with the perennial stream channel. They will also improve the water quality of the flows discharged into the slough and into Cutler Reservoir. Implementation of the project will also result in the removal of livestock grazing from the existing wetlands that will not be disturbed by project construction.

Cumulative impacts to wetlands in the vicinity of the project area and along Swift Slough include road crossings, construction of individual homes or small subdivisions, incorporation of wetlands into agricultural fields, and water quality degradation associated with livestock grazing and feedlots adjacent to the channel. Implementation of the Logan City Effluent Polishing Wetlands project will result in a substantial increase in wetland acreage within the watershed and will provide a net benefit to the vicinity in terms of wetland functions and values.

Cross-section and Fill Areas in Existing Wetlands - Figure 7 illustrates the distribution of wetland areas to be filled, excavated, or otherwise impacted by construction of the Logan City Effluent Polishing Wetlands project. Figure 8 includes cross-sections of the surface topography of two wetland cells within the project area, with and without the project. The comparison of the existing surface topography with the proposed project surface topography indicates that a combination of fill and excavation will be required at these locations to achieve the design topography.

Minimization of Impacts to Existing Wetlands - The selection of an appropriate project area for the Logan City Effluent Polishing Wetlands was limited in scope by the necessity of locating the site between the discharge point from the municipal water treatment facility and Swift Slough due to water rights and watershed considerations. The project area selected for the project is the only parcel within the target area that is large enough to accommodate the project and that consists primarily of upland pasture. The selection of any other 240 acre parcel within the target area for the project would result in substantially more wetland impacts due to project implementation.

Within the selected site, the project has been designed to completely avoid direct impacts to the isolated swale wetland west of Swift Slough and to the wetlands associated with the Swift Slough channel, with the exception of the outfall structure between the wetlands and the slough (Figure 7, Appendix A). Project facilities to be located south of the abandoned railroad grade (inlet pond, pump station, and part of the sixth wetland cell) have been placed to the extent possible on upland portions of the pasture and various iterations of the project plans have been considered in order to arrive at the current plans, which minimize the wetland impacts to the extent practicable. Since most of the direct impacts to wetlands, with the exception of the construction of dikes, roads, and the pump station, will be associated with the construction of additional wetland acreage, the net effect of those impacts will be the incorporation of the existing wetlands into a larger and more diverse wetland mosaic.

To minimize indirect impacts during construction to existing wetlands within the project area that will not be impacted by the completed project, Best Management Practices will be implemented. Construction boundaries will be surveyed and clearly marked to prevent unnecessary travel by vehicles through the wetlands. Silt fences will be placed along the boundaries between the construction area and the wetlands to prevent siltation into the wetland areas. In particular, hay/straw bales and silt fences will be placed along the tops of the Swift Slough banks to prevent the discharge of soil or sediment into the channel or associated wetlands. Straw bale barriers will be placed at the construction boundaries in swales or other areas that are subject to overland flow to provide filtration of runoff before it leaves the construction zone.

During construction of the outfall structure into Swift Slough, excavated material removed from the banks will be placed behind the hay bale/silt fence barriers to prevent any discharge or sloughing into the channel. Only the outfall pipe and clean rock riprap will be placed below the ordinary high water line of the channel and its associated wetlands. If at all possible, construction of the outfall structure will take place during the low flow period for Swift Slough to reduce the potential for erosion and siltation to occur. A diagram of the outfall structure to Swift Slough is presented in Appendix A.

MITIGATION: To compensate for the impacts to existing wetlands by the project, 10.22 acres of marsh and wet meadow wetlands will be created from existing upland areas within the project area. The mitigation wetlands will be constructed in the southwest corner of the project area on the perimeter of the inlet pond, but will be separate physically and functionally from the treatment wetlands (Figure 3). The mitigation wetlands will be physically and functionally contiguous with the existing

wetlands within the project area that will remain undisturbed by project construction and will replace an upland pasture area that supports primarily nonnative grasses.

At the present time, the existing wetlands in the southwest corner of the project area receive surface flows from the southeast. Those surface flows are provided by surface flows that originate from Blue Springs and are conveyed to the site via irrigation ditches and overland flow. There may also be a contribution from artesian wells and tile drains in upgradient pastures or agricultural fields to the flows that support the wetlands on the site, but the extent to which such flows occur is not known. The objective of the mitigation wetland construction will be to transfer and expand the hydrology that is currently supplying wetlands that will be filled or excavated by the project onto existing upland areas on the site for the purpose of establishing replacement wetlands in those areas.

To provide wetland hydrology to the mitigation wetland area, the surface elevation will be lowered to the same elevation as the adjacent existing wetlands or slightly lower. This will require the removal of six inches to one foot of topsoil from the area, the excavation of up to three feet of subsoil, and the replacement of the topsoil to establish the target surface elevation. The mitigation wetland surface will be nearly flat, with a very slight slope toward the west.

Water will be supplied to the portion of the mitigation wetland area located south and east of the inlet pond via culverts that will be installed under the access road along the south edge of the property. The culvert locations and capacity will be designed to maintain existing flows to the undisturbed wetlands and to provide surface flows to the mitigation wetlands south of the inlet pond. To provide wetland hydrology to the portion of the mitigation wetland area located north and west of the inlet pond, runoff and tailwater that currently leaves the project area via the borrow ditch adjacent to the abandoned railroad grade will be conveyed in a culvert through the railroad grade and the project inlet structures. The water will be discharged into the mitigation wetland area and allowed to spread over the entire area. The objective will be to establish sheet flow over the both portions of the mitigation wetland area, which will provide conditions of long-term soil saturation and shallow inundation.

The mitigation wetland area will be seeded with the seed mix specified for the wet meadow portions of the polishing wetlands. If possible, the top six inches of topsoil will be removed separately from the nonweedy portions of the sedge/rush meadow wetlands to be filled or excavated by the project and reapplied as a topdressing to the mitigation wetlands. The wetland topsoil will provide whole plants, seeds, and roots of wetland species present on the site to augment the species planted in the seed mix. Alternatively, if the timing of construction allows, plugs of wetland plant species could be removed from the wetlands to be disturbed and planted within the mitigation wetland areas to provide centers from which vegetative propagation of wetland vegetation could occur. Trees and shrubs of the same species planted within the polishing wetlands will be planted in random clumps in the vicinity of the western and southern perimeters of the mitigation wetland area to provide screening from traffic along the roads. The entire project area will be fenced to exclude livestock and human trespass, which will protect the mitigation wetlands as well as the project wetlands. The exclusion of grazing

livestock will also result in the enhancement of the remaining undisturbed wetlands within the project area relative to their current condition.

The mitigation wetland area will be monitored for wetland establishment success for at least three years following implementation of the project. Wetland establishment success will be assessed relative to ecologically-based success criteria, including cover by nonweedy hydrophytic plant species, absence of noxious weeds, and the effectiveness of the water delivery system in providing adequate hydrologic conditions to support hydrophytic vegetation. Failure of the mitigation wetlands to satisfy the success criteria will result in the implementation of contingency plans, including but not limited to an increase in water delivered to the site via ditches or artesian wells, adjustment of surface topography, reseeding or planting of additional plugs of wetland plant species, application of weed control measures, etc. Maintenance of the entire project area, including the mitigation wetlands, will be the responsibility of the City of Logan.

Details of the wetland mitigation plan, including detailed monitoring, maintenance, and contingency plans, will be developed in conjunction with final project design plans.

No Net Loss Requirement - Total direct impacts of the Logan City Effluent Polishing Wetlands project to jurisdictional wetlands within the project area will include 9.71 acres of excavation, fill, and related construction impacts. Implementation of the wetland mitigation plan will result in the creation of 10.22 acres of replacement wetlands from upland areas within the project area, not including the wetlands to be constructed for the purpose of polishing effluent water quality. Thus, there will be no net loss of wetland acreage within the project area outside of the treatment wetlands.

The mitigation wetlands to be created within the project area will be contiguous with the existing wetlands located south of the abandoned railroad grade that will remain undisturbed by project construction. They will be constructed to share the same topography and sources of wetland hydrology as those wetlands and it is anticipated that the resulting replacement wetlands will be similar in vegetation characteristics and hydrologic conditions to those existing wetlands. Thus, it is anticipated that the mitigation wetlands will provide the same functions and values as are currently provided by the sedge/rush wet meadow wetlands and small stands of marsh vegetation located south of the abandoned railroad grade. Since the existing sedge/rush wet meadow and marsh wetlands within the project area provide a broader diversity of wetland functions and values on a more consistent basis than the wetlands associated with the tributary to Swift Slough, the mitigation wetlands are likely to do the same relative to at least some of the wetlands to be impacted by the project. In addition, the integration of the mitigation wetlands into the large mosaic of treatment wetlands and associated upland areas will increase their value relative to the existing wetlands which are included in heavily grazed upland pastures.

Even though they cannot be considered as compensatory mitigation for wetland impacts, the treatment wetlands to be constructed as part of the Logan City Effluent Polishing Wetlands project will provide additional wetland functions and values to the

vicinity of the project area. Although the water source to the wetlands will consist of effluent from the municipal water treatment facility, the quality of that effluent is adequate for release as irrigation and many acres of wetlands in the vicinity of the project area are currently supported by that effluent without adverse effect. Since the project involves the construction of wetlands for the purpose of polishing the quality of effluent from the municipal water treatment facility, it will result in the creation of 34.7 acres of marsh wetlands, 66.0 acres of wet meadow wetlands, and 40.88 acres of open water habitat within the treatment wetland cells and the inlet pond (Figure 4 and Table 1) in addition to the 10.22 acres of mitigation wetlands. As a result, the implementation of the project will result in a net gain in wetland acreage of 33.78 acres of marsh wetlands, 67.43 acres of wet meadow wetlands, and 40.88 acres of open water habitat.

Despite their status as treatment wetlands, the wetlands in the cells to be constructed as part of the Logan City Effluent Polishing Wetlands project will be more diverse than the existing wetlands within the project area. All of the wetland types, including open water, marsh, and wet meadow wetlands, will be distributed throughout the project area instead of confined to isolated locations surrounded by upland pasture. The wetland types will also be more intricately interspersed, providing greatly increased edge habitat between wetland types. Islands of upland and wet meadow habitat, surrounded by wetter marsh or open water habitat, occur within each of the project wetland cells. In addition, clumps of shrubs and trees will be scattered throughout the project area. As designed, the project wetlands will provide greater horizontal and vertical structural diversity of habitat, as well as increased wetland area. It is anticipated that the terrestrial wildlife habitat values of the project area will be substantially increased by the project, relative to current conditions.

The terrestrial wildlife habitat values of the constructed wetlands will be affected by management of those wetlands. In order to reduce depredation by wildlife on agricultural fields in the vicinity, as well as to reduce the contributions of ammonia and fecal coliforms to the water in the treatment wetlands, it may be necessary to implement measures to discourage the use of the site by large numbers of wildlife, particularly waterfowl. Such measures will reduce the value of the wetlands as habitat for some wildlife, but not eliminate it entirely. To maintain the effectiveness of the project wetlands in removing ammonia from the effluent, the vegetation biomass, within which most of the nitrogen removed from the water will be stored, will be removed periodically and composted at the landfill. Mowing will take place after the first frost, however, which will minimize the impacts of the biomass removal to wildlife. Mowing will also be implemented such that adequate standing biomass will remain within the wetlands to provide some cover for wildlife and to maintain oxygen transport to the roots of the plants.

It is anticipated that each wetland cell within the project may require dredging approximately once every 20 years to remove accumulated sediment. Dredging will be necessary to maintain open water channels and flows through the wetland cells, as well as to remove metals and other contaminants that accumulate with the sediment. Only one or two wetland cells are likely to be dredged in a given year, which will leave the remainder of the habitat on the site available for wildlife use. The length of the time interval between dredging events and the presence within the site of undisturbed

habitat during a give dredging event will minimize the impacts of this maintenance activity to wildlife using that habitat. Since flows through individual wetland cells can be controlled separately, it is also possible that dredging could be scheduled for some point during the year when habitat use within the project area is minimal.

With respect to aquatic habitat values, the increased amount of open water features and perennial flow in channels within the project relative to current conditions is expected to more than compensate for any project impacts to aquatic habitat, especially since the only existing wetland with perennial flow is Swift Slough, which will be minimally impacted by construction of the outfall structure.

The constructed wetlands are designed to perform the wetland functions associated with water quality improvement, including soil stabilization, sediment/toxicant retention, and nutrient uptake/ transformation. Assuming that wetland establishment is successful, the project wetlands will more than adequately compensate for the loss of these functions, as provided by the existing wetlands within the project area. Flow control inherent to the project wetlands will provide floodflow desynchronization during runoff periods. Groundwater is likely to be alternately discharged to and recharged from the project wetlands, depending on the seasonal elevations of the water table relative to the excavated portions of the project area.

Additional information regarding wetland construction is included in the project description section of this document and in Appendix B. Detailed wetland construction, planting, and project maintenance plans will be developed in conjunction with the detailed project design plans.

ALTERNATIVES: As described previously, the selection of an appropriate project area for the Logan City Effluent Polishing Wetlands project was limited in scope by the necessity of locating the site between the discharge point from the municipal water treatment facility and Swift Slough due to water rights and watershed considerations. The project area selected for the project is the only parcel within the target area that is large enough to accommodate the project and that consists primarily of upland pasture. Any other 240 acre parcel within the target area for the project would have included substantially more acreage of existing wetlands than the selected site does.

A variety of water treatment alternatives were considered during the project planning process. Those alternatives include:

1. Air stripping tower or spray ponds;
2. Breakpoint chlorination;
3. Slow sand filters;
4. Cation exchange;
5. Biological nitrification;
6. Winter storage and slow rate land application or discharge to irrigation ditches;
7. Pipe effluent for discharge into the Great Salt Lake;
8. Lemna system; and

All of these alternatives were found to be inferior to the proposed effluent polishing wetland system. A summary matrix comparing the nine alternatives to the selected alternative is included in Table 3. A more detailed discussion of the advantages and disadvantages of the alternative treatments is included in the Engineering Report in Appendix B of the permit application.

TABLE 3
Alternative Summary Matrix
Logan City Effluent Polishing Wetland Project

	Alternative	Viable	Total Cost	Level of Treatment	Ancillary Benefits	O/M Required	Expandable	Permanent Solution
1	Air stripping/spray ponds	no	n/a	n/a	n/a	n/a	n/a	n/a
2	Breakpoint chlorination	yes	$12.0 million	good	negative	significant	yes	no
3	Slow sand filtration	yes	$9.0 million	questionable	positive	little	yes	maybe
4	Cation exchange	no	n/a	n/a	n/a	n/a	n/a	n/a
5	Biological nitrification	yes	$15.0 million	excellent	very positive	significant	yes	yes
6	Land application	no	n/a	n/a	n/a	n/a	n/a	n/a
7	Pipe to Great Salt Lake	no	n/a	n/a	n/a	n/a	n/a	n/a
8	Lemna system	no	n/a	n/a	n/a	n/a	n/a	n/a
9	Do-nothing alternative	??	$15.0 million	violation	negative	n/a	n/a	no
10	Polishing wetlands	yes	$8.8 million	good	positive	little	yes	yes

(Source: Engineering Report for Logan City Wastewater Polishing Wetlands, Psomas, Salt Lake City, Utah. January 2002)

THREATENED AND ENDANGERED SPECIES: The project area for the Logan City Effluent Polishing Wetlands project is not considered to be habitat for any threatened or endangered plant or animal species, although it is possible that bald eagles (*Haliaeetus leucocephalus*) may occasionally perch in the trees on the site during the winter when they are present in Cache Valley. Implementation of the project is expected to potentially enhance hunting and perching opportunities for the wintering bald eagles, with no adverse effects to other threatened or endangered species.

In its current condition, the project area is considered to be potential habitat for the burrowing owl (*Athene cunicularia*), the short-eared owl (*Asio flammeus*), and the long billed curlew (*Numenius americanus*) which are considered to be sensitive species by the state of Utah. Current use of the site by these species could not be confirmed

due to the presence of snow cover during the field reconnaissance. Similar habitat is available immediately adjacent to the project area and throughout Cache Valley. Implementation of the project is not expected to adversely effect populations of these species.

OTHER AUTHORIZATIONS REQUIRED

Cache County right-of-way permit for delivery ditch - in preparation
Benson Area Planning Commission Conditional Use Permit - granted
Utah Division of Water Quality permit - in preparation
new Utah Pollution Discharge Elimination System permit - in preparation

ADDITIONAL INFORMATION:

CULTURAL RESOURCES: James L. Dykmann of the Utah State Historic Preservation Office (SHPO) was consulted regarding the potential impacts of the project to cultural resources within the project area. According to Mr. Dykmann, no known historic properties have been recorded within the project area because no surveys of such properties have been conducted. The potential for finding cultural resources in the area of potential impact by the project is considered by SHPO to be limited and additional surveys for such resources are not recommended.

This activity would not affect any threatened or endangered species or thier critical habitat. The District Engineer has made this determination based on information provided by the applicant and on the Corps' preliminary investigation.

Interested parties are invited to submit written comments on or before **May 3, 2002**. Any person may request, in writing, within the comment period specified in this notice that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing.

Certification that the proposed work, if permitted, will not violate applicable water quality standards have been requested from the Utah Division of Water Quality. The Utah Division of Water Quality intends to issue certification, provided that the proposed work will not violate applicable water quality standards. Projects are usually certified where the project may create diffuse sources (nonpoint sources) of wastes which will occur only during the actual construction activity and where best management practices will be employed to minimize pollution effects. Written comments on water quality certification should be submitted to Mr. William O. Moellmer, Utah Division of Water Quality, 288 North 1460 West, PO Box 144870, Salt Lake City, Utah 84114-4870, on or before **May 3, 2002**.

The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the

cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership, and in general, the needs and welfare of the people.

The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

If additional information is required, please contact City of Logan at 435-716-9752 or Mr. James Thomas of the Utah Regulatory Office, telephone 801-295-8380, extension 18 or email *Jim.Thomas@usace.army.mil*. Written comments should reference Public Notice Number 200250109 and should be mailed to the U.S. Army Corps of Engineers, Utah Regulatory Office, ATTN: Mr. James Thomas, 533 West 2600 South, Suite 150, Bountiful, Utah 84010. Comments are due **May 3, 2002**.

Michael J. Conrad, Jr.
Colonel, Corps of Engineers
District Engineer

Enclosures: Drawing(s)