MITIGATION PLAN FOR THE
OLD TOWN NORTH PROJECT DETENTION POND

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1.0 INTRODUCTION

The proposed Old Town North Project encompasses approximately 45 acres and provides for the development of a variety of home sites along with typical infrastructure systems. The project will result in the direct loss of approximately 0.18 acres of wetlands, known locally as the Josh Ames Ditch, due the construction of a required detention pond. The detention pond, in total, is also considered to be an open space project element which will require stabilization and revegetation with native plant species.

The objectives of this mitigation plan are to establish a diverse, self-sustaining wetland vegetation community within the low point of the detention pond to be constructed, and to stabilize the surrounding slopes through the planting of adapted upland vegetation species. The wetlands to be created will total approximately 0.18 acre resulting in a mitigation ratio of 1.0 acre created :1.0 acre disturbed. The upland vegetation community to be developed will provide for maximum site stabilization while lending an measure of esthetic appeal and wildlife habitat.

Following this Introduction, Section 2.0 discusses existing site conditions and summarizes proposed construction activities pertinent to this mitigation plan. Section 3.0 presents the revegetation techniques to be employed to achieve mitigation objectives. This section also includes soil handling alternatives and specifications. Site stabilization techniques for adjunct areas, where minimal disturbances may occur, are included in Section 4.0. A weed control plan summary, mitigation schedules, and management and maintenance are the topics of sections 5.0, 6.0, and 7.0 respectively. Tables referred to in the text follow Section 7.0, as do detailed specifications for all revegetation techniques referred to in this plan. A cross-section and maps prepared to support this mitigation plan are included at the end of this document.
2.0 SITE CHARACTERIZATION AND PERTINENT CONSTRUCTION SUMMARY

2.1 Current Site Characteristics

The proposed Old Town North Project area consists of a nearly level agricultural field that was farmed in the recent past. The soils overlying the site consist of the Nunn clay loam, 0 to 1 percent unit as mapped by the Natural Resources Conservation Service. This upland soil is typically deep, well drained, and is forming in alluvium. The unit is not subject to flooding and the depth to a seasonal water table is typically greater than 6.0 feet. The soils are fertile, currently supporting a comparatively dense stand of introduced grass and forb pasture species dominated by smooth brome (*Bromus inermis*) and alfalfa (*Medicago sativa*). Weedy grass and forb species are present, but typically exist as small concentrated inclusions within the dominant vegetation type.

Wetlands on site, as mapped in May of 2000, are confined to two areas associated with irrigation features. The drainage channel to the north is not scheduled for disturbance as a part of this project. The irrigation channel to the south, known as the Josh Ames Ditch, is proposed to be filled as a part of detention pond construction, as noted above (see Map 1). This wetland occurs as a narrow, deeply incised drainage channel running from west to east near the southern boundary of the project area. The main source of water currently entering this ditch, and supporting the existing wetland, appears to come from runoff channeled from across College Avenue to the west. In addition, it is likely that the ditch did receive irrigation waste water from the fields to the north when the project area was farmed. Groundwater levels ranged from approximately 4.0 to 9.0 feet across the project area as measured in December 2000 by Terracon during a geotechnical study conducted for Old Town North, LLC. Groundwater levels at other times of the year are unknown. While groundwater may, in part, currently support the wetlands of the Josh Ames Ditch, the extent to which this occurs cannot be evaluated given existing information.

Wetlands within the Josh Ames Ditch, for all intents and purposes, consist of a dense monoculture of Emory's sedge (*Carex emoryi*). A few other forb species are present within the community but occur only as inclusions. In addition, one boxelder (*Acer negundo*) tree has become established along the wetland proper. This palustrine emergent wetland has limited functions and values given its form, size (0.18 acre), and composition. The narrow, linear form of this wetland, occurring as it does in an incised drainage, offers little in the way of wildlife habitat. Although it may function as a wildlife corridor, it is more likely that wildlife movement is
concentrated along the Lake Canal located immediately to the south. While this wetland vegetation community probably served to enhance the water quality of any irrigation waste water entering it in the past, current functions are limited to soil stabilization. Given the form, size, and limited function of this wetland, it is believed that it has a "low" value, at best.

### 2.2 Construction Summary

Construction of the detention pond is proposed to start in the summer of 2001. The detention pond will be located in the southern portion of the project area (see Map 2) and encompass approximately 5.5 acres. Approximately 1.0 to 2.0 feet of fill material will be placed over the pond site to raise the area to design elevations ranging from 4,958 to 4,962 feet. (The surface 1.0 foot will consist of soil materials suitable for use as a plant growth medium.) Constructed pond slopes will range from nearly level to 25 percent. The central drainage constructed within the pond will slope an average of 0.5 percent. Final topography of the pond will reflect a gentle, uninterrupted slope free of significant surface undulations. Five drainage collection points will be constructed near the crest of the pond slope. Surface water drainage collected from the 45-acre project area will flow to these points, from which the water will enter the detention pond via overland flow.

As noted on Map 2, a "valley pan" system will be constructed at the toe of the detention pond slope to handle "nuisance flows" and to direct surface drainage off site. The pans will be constructed of concrete, assume a "V" shape, and have a design depth of approximately 1.0 inch. Within this pan system, as noted on the map, the wetland mitigation area will be constructed.

The wetland mitigation area will be approximately 0.18 acres in size. The elevation of the wetlands will be from 0.5 to 1.0 feet lower than the surrounding uplands and upland/wetland transition zones. The reduced elevation will serve to concentrate surface runoff within the wetlands and provide a soil moisture regime suitable for wetland plant establishment and maintenance. There is also a potential for flooding of the surrounding uplands during periods of heavy rainfall.

The hydrology which will support the wetland mitigation area will come primarily from surface flows originating from approximately 38.0 acres of the proposed development. In addition, surface runoff from 4.0 to 5.0 acres from west of the project area will drain into this detention pond. As can be noted on the map, the pan system will also serve to direct any incident nuisance flows into the wetland mitigation area further helping to support the wetlands
during periods of low precipitation. No hydrologic contribution is expected from groundwater given the depth of fill or from the existing culvert which will be redirected to the Lake Canal.

Figure 1 depicts the detention pond in cross-section at a point across the wetland mitigation area.
3.0 REVEGETATION SPECIFICATIONS

3.1 Soil Handling

3.1.1 Soil Salvage and Stockpiling

Significant filling will be required over the project area to bring it to the required elevation. In addition, quality soil will be required as a seedbed material to increase the potential for revegetation/mitigation success and to reduce the potential for weed infestation. At this time, it is not known whether endemic seedbed materials will be used for revegetation or whether they will be imported to the site with other fill materials. If a quality topsoil material is imported to the site, such material will be stockpiled and the stockpile stabilized as described below. If on-site surface soils are selected for use, the following handling techniques will be employed.

Prior to salvage, the surface 3.0 to 6.0 inches of soil will be scalped from 5.5 acres of existing uplands. This technique will be completed to reduce the potential for the re-establishment of existing introduced grass and forb species as well as to eliminate, to a large degree, a seed source for weedy species. The upper 1.0 foot (approximately 8,870 cubic yards) of soil will then be salvaged. As soil is salvaged it will be transported to, and placed in, defined soil stockpiles. The stockpiles will be clearly identified with signs to distinguish them from subgrade or other construction materials.

Soils within the Josh Ames Ditch will also be salvaged to a depth of 1.0 foot (approximately 290 cubic yards) and placed in a stockpile separate from that used to store upland soils. The scalping technique used as a part of upland salvage sequence will not be applied during wetland soil salvage operations.

The stockpiles will be protected from operational disturbances to maintain facility integrity. The stockpiles will assume as low a profile as possible to decrease wind erosion potential and be oriented, along the longitudinal axis, perpendicular to the prevailing wind direction where space permits. When portions of the stockpiles are removed for soil redistribution, removal will begin on the leeward side of the stockpiles to avoid disturbances to the windward side.

3.1.2 Soil Stockpile Stabilization

The stockpiles will be vegetatively stabilized during the first appropriate planting season following construction if they will exist through one or more growing seasons. During construction, the surface of the stockpile will be left in a roughened condition. Fertilizer will be
evenly broadcast over the stockpile surface at recommended rates and the seedbed roughened to incorporate the fertilizer into the seedbed. Seed, at the specified rates, will then be broadcast over the seedbed. The seedbed will be lightly roughened to cover the seed. The stockpiles will be mulched using straw or hydromulch and the mulch anchored to complete the stabilization process. The seed mixture to be used is depicted in Table 1: Soil Stockpile Stabilization Mixture.

3.1.3 Subgrade Material Preparation

Detention pond construction and rough grading will take place to meet the desired elevation, slope, and channel configuration objectives. All efforts to minimize excessive compaction will be taken during rough grading activities. Rough grading will be limited to removing ridges, depressions, and surface features which would inhibit subsequent resoiling activities. A rough surface which will promote soil "bonding" between the reapplied soil and the underlying subgrade will remain following grading. Rough grading activities should take place, where appropriate, along the contour and perpendicular to the channel flow direction to reduce the potential for erosion. A smooth, compacted surface typical of construction grading is not desirable from reapplied soil stability and vegetation establishment perspectives.

Where compaction is excessive and could inhibit plant growth, the sub-grade will be ripped or otherwise treated to relieve compaction. Ripping may be eliminated from the technique sequence if subsoil compaction is considered to be of no consequence or ripping would inhibit the development of the desired wetland plant community through increased subsoil permeability rates.

3.1.3 Soil Redistribution

Soil will be applied on areas to be revegetated when hydrologic conditions in the drainage do not unduly hinder equipment operations. Approximately 12.0 inches of soil will be respread over all areas to be revegetated bringing the surface of the soil seedbed to the design grade elevation. (Stockpiled wetland soils will be reserved for reapplication over the identified wetland mitigation area.) An application depth ranging from 9.0 to 15.0 inches will be considered acceptable given equipment capabilities.

During resoiling operations, soil will be redistributed in a manner which: (1) achieves an approximate uniform thickness consistent with safety requirements, post-mining land use objectives, and surface water drainage systems; (2) minimizes compaction and erosion of the soil resource; and (3) minimizes deterioration of the biological, physical, and chemical properties of the soil to the degree possible. Soil will be applied in as thick of lifts as possible to minimize
equipment passes over the resoiled area. All final grading will be completed along the contour, where safety conditions permit, to minimize erosion and maximize site stability.

During final grading, the creation of a smooth compacted surface, common to typical construction grading operations, will be avoided. A somewhat rough surface, which permits agricultural machinery access, is desired in upland areas. In wetland areas, the resoiled surface will be fine graded to remove higher surface undulations which would promote the formation of upland vegetation plant communities. Low, narrow ridges and shallow potholes can be left over the graded wetland surface to encourage a diversity of soil moisture regimes conducive to maximizing wetland species diversity.

3.2 Revegetation

The wetland mitigation and upland revegetation proposed here-in constitute a program which includes simplistic grading, soil handling, site preparation, and planting techniques which have a history of success along the Front Range and throughout the West. As a result of this simplistic approach, centered on proven agricultural plant establishment techniques, it is believed that a high potential for mitigation/revegetation success has been created.

The perennial species selected for planting in both the wetlands and uplands are all considered to be native and, in the case of those included in the wetland mixture, qualify as hydric species (FAC or OBL) according to Corps of Engineering guidelines. This range in wetland plant species tolerance, with respect to varying soil moisture regimes, was purposely addressed to account for a potential annual variance in flooding/soil saturation conditions within the wetland mitigation area. Species selected for use in upland areas have comparatively rapid establishment and growth rates. Forbs and one shrub species were also included in the upland mixture to address esthetic concerns. All species selected have value for the wildlife community expected to occupy the site following detention pond construction.

Coyote willow (*Salix exigua*) cuttings will be planted along the borders of the wetland area to introduce a wildlife habitat element uncommon to the development site as a whole. The willow plantings will result in a tall shrub canopy which can provide a wildlife cover element not currently existing along the Josh Ames Ditch. In addition, this species is characterized by an ability to rapidly expand into amenable areas which will be to the project's advantage given the potential for temporary flooding.
3.2.1 Wetland Mitigation Area

Following final grading, stockpiled wetland soils will be applied to the prepared sub-grade to a depth of approximately 1.0 foot. Soil samples will be taken and the samples submitted to a selected laboratory for analyses and fertilizer recommendations. Fertilizer in the recommended amounts, if any, will be broadcast over the seedbed and the soil surface disked or harrowed to work the applied fertilizer into the soil. The seed mixture shown in Table 2: Wetland Mixture will then be broadcast over the seedbed. Following drilling, the seeded area will be mulched with straw at the rate of 2.0 tons per acre and the straw anchored by crimping. If crimping is not possible due to space considerations related to pan construction, the straw may be anchored by netting or any equivalent method. While mulching may not be necessary for conserving moisture in this instance, it is seen as a means of reducing the potential for seed washing.

Willow cuttings will be planted along the northern and southern borders of the wetland mitigation area the first spring planting season following mitigation area construction. Planting sites will be selected by the planting supervisor based on existing and projected soil moisture regime conditions. A saturated but not flooded soil planting medium is preferred, although it can be assumed that the willow planting area will be subject to temporary flooding in the future. Cuttings will be planted on 3.0-foot centers (approximately 145 total cuttings) along the mitigation area borders.

3.2.2 Adjacent Detention Pond Uplands

Following rough grading, the disturbed area will be ripped to relieve compaction, if such would interfere with plant root growth, and the designated seedbed materials respread to an average depth of 1.0 foot. A depth range of from 9.0 to 15.0 inches will be considered acceptable. Soil samples will be taken and the samples submitted to a selected laboratory for analyses and fertilizer recommendations. Following receipt of the analyses, fertilizer will be broadcast over the prepared surface at recommended rates, if any, and the soil disked or harrowed to work the fertilizer into the soil. (Disking or harrowing will occur with or without fertilizer application as a method of seedbed preparation.) The seed mixture shown in Table 3: Native Prairie Mixture will then be drilled into the seedbed. Simultaneously, four-wing saltbush (Atriplex canescens) will be broadcast over the seedbed. Following planting, the seeded area will be mulched with straw at the rate of 2.0 tons per acre and the straw anchored by crimping.

Depending upon the soil analysis and seedbed material characteristics, consideration will be given to applying fertilizer in a split application with all or part of the required nitrogen fertilizer
being broadcast at the beginning of the second growing season. By reducing the level of nitrogen available during the first growing season, it is generally recognized that weed growth can be suppressed incrementally without similarly affecting the native grass, forb, and shrub species to be established.
4.0 ADJUNCT AREA STABILIZATION

During construction, the soil surface may be disturbed at equipment staging areas and similar sites resulting in a loss of vegetative cover. In such cases, extensive application of revegetation techniques is not desirable where a more simplistic range of restoration techniques will suffice. The following alternatives to intensive reclamation will be applied where conditions warrant.

- Supplemental fertilization. The disturbed area will be broadcast fertilized at recommended rates where it is determined that the remaining vegetation can successfully stabilize the area with a supplemental fertilizer treatment. Access to treated sites will be prohibited until vegetation has become adequately established.

- Supplemental seeding. The disturbed area will be seeded where it is determined that the existing plant cover is not sufficient to hold soil in place. Minimal seedbed preparation and soil covering will be acceptable. Following seeding, the treated site will be mulched and the mulch anchored by applicable means. Access to treated sites will be prohibited until vegetation has become adequately established. This alternative may be combined with supplemental fertilization as necessary. The native seed mixture to be used is depicted in Table 3: Native Prairie Mixture.
5.0 WEED CONTROL PLAN SUMMARY

Several techniques are included in this mitigation plan to retard the invasion and establishment of weedy plant species. However, the potential for weed invasion remains. This section summarizes the elements of the weed control plan which will be prepared in detail at the end of the first full growing season following planting. Should a significant weed infestation be identified prior to this date, weed control planning will be initiated immediately. The completed plan will be submitted to local, State, and Federal agencies, as required, for review and approval.

The weed control plan will be prepared by a Licensed Commercial Pesticide Applicator (LCPA). All subsequent weed control activities will also be conducted by an LCPA. The plan to be prepared will take the form of an Integrated Pest Management Plan (IPM) which will consider all methods of control that would potentially be applicable to the project area. These methods include mechanical, chemical, cultural, and biological techniques. Prior to plan preparation, a visit to the project area will be conducted by the LCPA to assess site conditions, routes of access, weedy species present, potential sources of run-on and run-off, wind conditions, and any other factors relevant to the weed control planning process. Given the presence of wetlands and open water in and near the detention pond, initial emphasis will be given to weed control methods other than those of a chemical nature. Herbicide transportation, storage, mixing, loading, application, and disposal methods will comply with all applicable requirements of State and Federal regulations.
6.0 REVEGETATION SCHEDULE

Excavation and grading may ordinarily occur during any month of the year. However, revegetation activities are more limited with respect to the time of year in which they should be completed and must be timed to coincide with a recognized planting season. Table 4: Fall Revegetation Schedule and Table 5: Spring Revegetation Schedule depict the two appropriate revegetation schedules, on a monthly basis, which can be followed to achieve the revegetation objectives set for this mitigation project. The fall schedule is preferred for this project to take advantage of overall climatic conditions related to soil moisture regimes/species establishment and, in a related manner, the suppression of weed growth.

Site conditions and/or annual climatic variations may require that these schedules be modified somewhat to achieve reclamation success.
7.0 MANAGEMENT AND MAINTENANCE

The detention pond will be managed as open space with no active recreational activities permitted within. Mowing will be limited to formally landscaped areas. No mowing will occur in open space or mitigation areas except as an integral part of a designated weed control program designed to re-established native plant species, as necessary.

The herbaceous seedings and willow plantings will be inspected at least once per month during the first growing season following planting. Areas of poor “seed take” will be noted. Any area remaining unvegetated by desirable species through the first growing season will be reseeded following the application of appropriate seedbed preparation techniques during the next applicable planting season. Seeded areas will then be straw-mulched and the mulch crimped into the seedbed or anchored using appropriate methods. Any areas found to be devoid of a mulch cover following the initial seeding will be re-mulched using manual techniques as soon as this condition is discovered. Overall willow planting success will be noted. Should a willow planting failure be detected at the end of the first growing season, a second cutting planting will be completed at the beginning of the second growing season. Remedial cutting plantings will be employed to replace cuttings which were not successful due to the failure of an adequate soil moisture regime to develop.