

Appendix L

HISTORY OF WETLAND MITIGATION PERFORMED FOR IMPACTS CAUSED BY THE PRC 421 ACCESS ROAD

Final January 2003

State Lease 421 Wetland Mitigation Plan

Pursuant to SBCO Development Permits
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**State Lease 421 Wetland Mitigation Plan
 SBCO EMERGENCY PERMIT (00-EMP-006 [RV01])
 CALIFORNIA COASTAL COMMISSION EMERGENCY PERMIT (E-01-027-G)**

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- Appendix 1. California Coastal Commission 12/4/02 Draft Wetland Mitigation Plan Review Letter**

- Appendix 2. County of Santa Barbara 12/11/02 Draft Wetland Mitigation Plan Review Letter**

- Appendix 3. Enlarged Map of Wetland Mitigation Area Showing Locations Where Rodeo® Must Be Used**

1.0 INTRODUCTION

This final plan was prepared by Watershed Environmental under contract to Venoco, Inc., and incorporates comments received from the County of Santa Barbara Energy Division and California Coastal Commission (Appendices 1 and 2) on the October 2002 Draft Wetland Mitigation Plan. The plan describes wetland mitigation measures that will be implemented along the lower portion of Bell Creek (Figure 1) by Venoco as compensation for wetland impacts incurred during performance of emergency repairs to the 421 Lease oil wells, piers, and access road.

1.1 Background Information

In January and April of 2001, 0.04 acres (1,566 sq. ft.) of coastal salt marsh wetlands were destroyed during emergency repairs to the access road serving the 421 Lease. There were three isolated wetlands affected: 1) 335 sq. ft. on the access road west of SL 421-1; 2) 140 sq. ft. on the access road west of SL 421-1; and 3) 1,107 sq. ft. at the eastern end of the access road immediately north of SL 421-2.

Compensatory mitigation to offset the permanent loss of these wetlands was required by the permitting agencies (County of Santa Barbara, California Coastal Commission, and U.S. Army Corps of Engineers) responsible for implementing the provisions of the California Environmental Quality Act, California Coastal Act, and U.S. Clean Water Act. The County of Santa Barbara was the lead agency until February 1, 2002 when the City of Goleta became incorporated and assumed the lead agency role. Currently, the Energy Division, under contract to the City of Goleta, is providing local agency oversight. The permitting agencies imposed the following wetland mitigation ratios for the different impacted wetlands: 3:1 for the two wetlands on the access road west of SL 421-1 and 5:1 for the wetland at the eastern end of the access road immediately north of SL 421-2. Table 1 contains a summary of impacted wetlands and required mitigation.

Table 1. Summary of Impacted Wetlands and Required Mitigation

Affected Wetland	Mitigation Ratio	Mitigation Area
335 sq. ft. on the access road west of SL 421-1	3:1	1,005 sq. ft.
140 sq. ft. on the access road west of SL 421-1	3:1	420 sq. ft.
1,107 sq. ft. immediately north of SL 421-2	5:1	5,535 sq. ft.
Total Mitigation Area		6,960 sq. ft.

A vegetation and wetland survey was performed prior to performance of the emergency repairs (URS Corporation 2001). Plants present in the impacted wetlands were: rabbitsfoot grass (*Polypogon monspeliensis*), saltmarsh sand spurrey (*Spergularia marina*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), Bermuda grass (*Cynodon dactylon*), cattail (*Typha latifolia*), African brass-buttons (*Cotula coronopifolia*), and saltgrass (*Distichlis spicata*).

Upland vegetation adjacent to the wetlands included: saltbush (*Atriplex lentiformis*), coyote brush (*Baccharis pilularis*), California bush sunflower (*Encelia californica*), cliff aster (*Malacothrix saxitalis*), sawtooth goldenbush (*Hazardia squarrosa*), and a variety of ruderal vegetation. Ruderal species included black mustard (*Brassica nigra*), castor bean (*Ricinus communis*), fennel (*Foeniculum vulgare*), and iceplant (*Mesembryanthemum nodiflorum*).

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Figure 1. Location Map

The impacted wetlands appeared to receive water from groundwater seepage, presumably enhanced by irrigation of the Sandpiper Golf Course on top of the bluffs. The largest impacted wetland was on a small platform below a break in the bluffs, where water became impounded behind a low berm at the edge of the road. These wetlands were probably created by human modification of the bluff area, including alteration of hydrology through golf course irrigation runoff and the placement of an impervious surface (i.e., the road bed) along the base of the slope. The primary functions of the impacted wetlands were: 1) limited retention of surface runoff, 2) reduction of nutrient levels in run-off, and 3) habitat for a few native plants, including cattails, saltgrass, cliff aster, and saltmarsh sand spurrey. With the exception of these three species, the other plants occurring in these wetlands were non-native. These disturbed and isolated wetlands were unlikely to provide quality habitat for animal species of conservation concern.

1.2 Site Selection

A concerted effort from May to August 2001 was made by Venoco, Inc. and Watershed Environmental to find an in-kind coastal salt marsh restoration site. We contacted the County Public Works Department, the County Water Agency, County Flood Control, the Southern California Wetland Recovery Project, the California Department of Fish and Game, the University of California, the Land Trust of Santa Barbara County, the Goleta Slough Ecosystem Management Committee, La Cumbre Mutual Water Company, and the owner of the Ocean Meadows Golf Course. None of these was able to help locate a site with the hydrogeomorphic characteristics necessary to establish salt marsh vegetation or an existing restoration project that Venoco could expand upon to fulfill their wetland mitigation requirement.

As a result of this failure to locate an in-kind mitigation site, and following conversations with the County Energy Division and Coastal Commission, Venoco and Watershed Environmental selected a riparian habitat mitigation site along the lower portion of Bell Creek, adjacent to the Venoco Ellwood Gas Processing Plant (Figure 2). This site includes a riparian revegetation area and a weed abatement area. Site selection was based on five factors:

1. Close proximity to impacted wetlands
2. Co-occurrence of some plant species from impacted wetlands
3. Access and availability
4. Adjacency to another mitigation site
5. Opportunity to improve wetland functions

The Bell Creek restoration site has significantly higher ecological value than the original impacted wetlands, but it is currently highly degraded and infested with a dense cover of non-native weeds, including fennel, castor bean, and German ivy (*Senecio milanioides*, now *Delairea odorata*). A few native plants persist embedded in the matrix of weedy exotics, including blackberry (*Rubus ursinus*) and clematis (*Clematis lasiantha*).

Restoration and revegetation at the Bell Creek site will provide quality habitat for species of conservation concern and will enhance biogeochemical functioning with deeper soils to help retain nutrients and allow infiltration of floodwater. Two species listed under the Endangered Species Act are known in the Bell Creek watershed: tidewater gobi and red-legged frog. Both will benefit from improvements to the riparian zone. Neither uses the type of wetland originally impacted.

Figure 2. Wetland Mitigation Site

This restoration will also complement ongoing restoration by the Bacara Resort just north of the Venoco restoration site. Together, these projects will restore a continuous riparian zone between the frontage road and the Bell Creek estuary. Reserve Page

1.3 Mitigation Goal and Objectives

The wetland mitigation goal is:

To ensure that no net loss of wetlands occurs as a result of the Venoco 421 Lease emergency repairs.

This will be accomplished by restoration of 7,000 sq. ft. of riparian habitat and performance of habitat enhancement measures in an adjacent 34,800-sq.-ft. area along the lower portion of Bell Creek. Existing non-native vegetation will be removed and replaced with native (i.e., naturally occurring) riparian vegetation in the riparian restoration area. Weed abatement measures will be performed in the habitat enhancement area.

The mitigation objectives are:

- ***Remove non-native vegetation***
- ***Improve soil conditions and prevent the reestablishment of weeds with the addition of organic mulch***
- ***Permanently establish self-sustaining native riparian vegetation***
- ***Improve the hydrologic, biogeochemical, plant habitat, and animal habitat functions***

2.0 EXISTING CONDITIONS AT MITIGATION SITE

2.1 Topography

The riparian revegetation mitigation area is approximately 350 ft. long by 20 ft. wide (7,000 sq. ft.). The site is bordered to the east by a gravel access road serving Venoco's 421 Lease and dense arroyo willow riparian forest vegetation along the western boundary (refer to Figure 2). The topography gently slopes to the west toward Bell Creek. The elevation within the mitigation area is approximately 20 ft. above mean sea level and has very little topographic relief other than a berm created by the gravel access road.

The weed abatement area is approximately 34,800 sq. ft. in size and is located to the north of the riparian revegetation area between the gravel access road, the frontage road bridge, and arroyo willow riparian forest vegetation on the eastern bank of Bell Creek (refer to Figure 2). The area surrounds the 10,200-sq.-ft. Bacara Resort mitigation/revegetation area, but does not include it. Topographically, the area is similar to the riparian revegetation mitigation area.

2.2 Vegetation

Existing vegetation within the riparian revegetation area is predominantly fennel, castor bean, and German ivy. The castor bean plants are tree like and are draped with German ivy vines. Fennel is growing along the edge of the gravel access road and in portions of the revegetation area not shaded by castor bean. There are a few isolated native shrubs growing in the revegetation area, including saltbush, blackberry, and clematis.

The vegetation in the weed abatement area is primarily non-native grassland, with a few large coast live oak trees and western sycamore trees. Weeds in the area include periwinkle (*Vinca major*) and garden nasturtium (*Tropaeolum majus*).

2.3 Hydrology

The riparian revegetation and weed abatement areas are located within the 100-year flood plain of Bell Creek. However, the area is expected to flood only during extreme storm events. The site also receives surface water runoff (sheet flow) from upland areas to the east, including the gravel access road. The site does not receive any surface water runoff from the gas processing plant or Sandpiper Golf Course. Given its proximity to Bell Creek, the site is expected to have relatively shallow groundwater (within 6-10 ft of the surface).

2.4 Soils

The US Department of Agriculture Soil Conservation Service mapped the soils in the project area as part of the Milpitas-Positas-Concepcion association (USDA 1977). This soil is usually associated with coastal marine terraces in Santa Barbara County. However, the soils in the riparian revegetation area are substantially degraded and mixed with a large fraction of coarse gravel washed in from the adjacent gravel road and previous disturbances. The soils in the weed abatement area were not sampled, but presumably were disturbed when the frontage road, train tracks, and 101 Freeway were constructed.

2.5 Land Use & Ownership

The Bacara Resort currently owns the mitigation site and is zoned for recreational use by the City of Goleta (SBCO 1993). Venoco has entered into a long-term agreement with Bacara to utilize the site for wetland mitigation. This use is compatible with City zoning and Bacara's wish to beautify the property. The Bacara Resort will be notified prior to initiating this project so that they are aware that work will be taking place in their easement and so they will understand the objectives of this project.

2.6 Hydrogeomorphic Functional Assessment

The US Army Corps of Engineers has developed a methodology to assess the hydrogeomorphic functions of riverine wetlands (Brinson et al. 1995). This methodology places riverine wetland functions into four major categories: 1) hydrologic, 2) biogeochemical, 3) plant habitat, and 4) animal habitat. This section provides a qualitative comparison of the existing functions in the riparian mitigation area to the anticipated functions following completion of the wetland mitigation measures by Venoco.

The existing hydrologic functions are severely degraded due to the lack of ground cover vegetation, low organic content of the soil, and presence of road gravel, which reduces the area's ability to provide dynamic and long-term surface water storage, energy dissipation, and moderation of groundwater flow or discharge. Implementation of the riparian revegetation measures includes the addition of organic matter (mulch) to the soil surface and installation of ground cover vegetation. Together these two measures will greatly improve the hydrologic functions of the area.

Biogeochemical functions include nutrient cycling, removal of imported elements and compounds, retention of particulates, and organic carbon export. Existing site conditions are only providing a low level of nutrient cycling and export of organic carbon. This is due to the poor vegetation cover (particularly ground cover) and lack of dense woody vegetation. Riparian revegetation will include the removal of the weeds currently on the site, mulching with organic matter, and planting of native riparian tree and ground cover species. The vegetation plantings and mulch will improve the overall biogeochemical functions of the site.

Plant habitat functions include maintenance of characteristic plant communities and detrital biomass. The existing non-native vegetation in the riparian mitigation site is not providing any of these plant habitat functions, but installation of native plants will remedy the situation.

Animal habitat functions include maintaining spatial structure of habitat, interspersed and connectivity, and the distribution and abundance of invertebrates and vertebrates. The existing habitat in the riparian mitigation area is not providing any of these animal habitat functions due to the dominance of non-native vegetation. Removal of non-native vegetation and revegetation with native species will provide the animal habitat functions that are currently missing from this site.

3.0 PROPOSED MITIGATION

3.1 Riparian Habitat Restoration & Enhancement

The proposed mitigation involves a combination of habitat restoration and enhancement measures. Habitat restoration to reestablish wetlands will be performed in the 7,000-sq.-ft. riparian revegetation area. Habitat enhancement to improve habitat conditions will be performed in the 34,800-sq.-ft. weed abatement area.

The habitat restoration area is adjacent to existing arroyo willow riparian habitat and is believed to have been riparian habitat historically. The area has a long history of human disturbance beginning with the construction of the railroad, Highway 101, oil and gas exploration in the 1920s and 1930s, construction of the gas processing plant in 1964, and construction of Sandpiper Golf Course in 1972. The suitability of this site for habitat restoration is evinced by its degraded conditions and high potential for improvement and connection to another mitigation/revegetation area.

3.2 Site Preparation and Weed Abatement

Riparian Revegetation Area

The riparian restoration site will be cleared of non-native weed species using a combination of: (1) hand removal, (2) cutting and mowing, and (3) application of chemical herbicides (RoundUp[®]/Rodeo[®]) at recommended concentrations. Rodeo[®] shall be used in areas within 50 ft. of the creek edge and RoundUp[®] in areas further than 50 ft. from the creek. Appendix 3 contains an enlarged map of the mitigation area depicting locations where Rodeo[®] must be used. Desirable native species (e.g., blackberry, clematis, and willow) will be marked by a biologist and avoided during the initial weed removal process.

All herbicide application will be by a licensed applicator who is knowledgeable of and

experienced in the proper use of herbicides near aquatic environments. No herbicides are to be used if there is a reasonable probability of rain in a 24-hour period following the desired application of herbicides. A "reasonable probability" of rain would be defined as a 20% or more chance of rain or showers for the Goleta area, according to the National Weather Service's local office forecast.

Castor bean, fennel, and German ivy are abundant on the site. These are well documented as aggressive weeds and classified as invasive exotics by the California Exotic Pest Council (1999). Special steps should be taken to ensure their removal and prevent their reoccurrence.

Caster bean plants on the site are mature, reaching over 9 ft. in height with thick stems. These plants will be removed manually by cutting them to the ground (using hand- and chainsaws) and treating stumps with 2% RoundUp® (glyphosate) to prevent resprouting. The soils in the restoration site are covered and presumably permeated with caster bean seeds. The best available strategy to prevent their reestablishment involves a combination of a pre-emergent herbicide treatment (diphenamid [Enide®] or benfen [Balan®]) to prevent seeds from germinating and a thick cover of mulch. The mulch layer will enhance the degraded soils on the site, and work in tandem with the pre-emergent treatment to inhibit weed establishment. This treatment requires that all restoration planting be shrubs and other mature vegetation.

Fennel (*Foeniculum vulgare*) is a difficult weed to remove. Plants within the restoration area will be treated with a foliar application of Garlon 4® (triclopyr). New fennel growth will be spot-treated with a concentration of 6 lbs. Garlon 4® mixed with 100 gallons of water. Depending on the timing of the restoration, this might involve either application during the primary spring growth or to regrowth following initial clearing. Garlon 4® is an oil-soluble herbicide and will be mixed with a colored dye that allows applicators to determine which plants have been treated.

German ivy is a perennial climbing vine that infests native vegetation by crowding, shading, and ultimately smothering desirable plants. Bell Canyon provides German ivy's preferred habitat: shady, disturbed sites with year-round moisture (e.g., stream banks). German ivy spreads easily, since fragments as short as one inch can be carried by runoff or landscaping machinery, take root, and infest new areas. The presence of ivy in riparian areas can lower plant diversity, change vegetation structure, and reduce rates of nutrient cycling (Alvarez 1997). Ivy will be removed following guidelines in *Invasive Plants of California's Wildlands* (Bossard et al. 2000): (1) manual removal of vegetation to access areas where ivy is emerging from the ground, (2) carefully removing roots and stems using a pointed or three-pronged rake to loosen soil, (3) ivy waste will be put into plastic bags with a small amount of soda lime to accelerate decomposition, (4) any resprouts will be treated with a foliar spray of 0.5% RoundUp® plus 0.5% Garlon 4® plus 0.1% Silwit® (silicone surfactant) at a rate of approximately 6.4 l/hectare. The chemical treatment is more effective when applied in the late spring after the plant has already flowered but is still growing actively. Care should be taken in the application of these chemicals to follow label instructions and avoid contamination of surface water.

Weed Abatement Area

Additional weed abatement will be conducted between the restoration site and the Bell Creek Bridge except in the 10,200-sq.-ft. Bacara mitigation area. A County-approved biologist will flag native plants for avoidance in this area, particularly oak seedlings and blackberry. The preliminary field assessment indicates that the most common non-native weeds are German ivy, periwinkle, and nasturtium.

Periwinkle and nasturtium will be removed by first cutting the vegetation with a weed-whip and then spraying a 5% solution of RoundUp® or Rodeo® on the fresh-cut plants. Rodeo® shall be used in areas within 50 ft. of the creek edge and RoundUp® in areas further than 50 ft from the creek. Appendix 3 contains an enlarged map of the mitigation area depicting locations where Rodeo® must be used.

In the following late spring or early fall the landscape contractor will collect goldenbush, saltbush, and cliff aster seeds from within the 421 Lease area. The landscape contractor will then hand broadcast the seeds in the weed abatement area.

3.3 Planting Pallet & Seed Source

All new vegetation will be planted as shrubs to allow for deep mulching and the application of the pre-emergent herbicide. Planting sites will be field-sited by the biologist using color-coded flags. Plantings will be designed to incorporate suitable species found in the impacted wetlands and characteristic riparian vegetation. Impacted species such as saltbush (*Atriplex lentiformis*), and cliff aster (*Malacothrix saxatilis*) will be planted on the relatively dry, well-drained upland edge of the restoration site. Further downslope, plantings will include arroyo willow (*Salix lasiolepis*), and sycamore (*Platanus racemosa*), with a groundcover of blackberry (*Rubus ursinus*), mugwort (*Artemesia douglasiana*), and wild rose (*Rosa californica*). Table 2 contains a summary of quantities to be planted. The plant materials will be provided by Growing Solutions, a local supplier specializing in providing native plants for restoration projects. All plant materials (cuttings and seeds) are from the Santa Barbara South Coast area.

Table 2. Plant List-Riparian Revegetation Site

Common Name	Scientific Name	Size (gal)	Quantity
Trees (quantity base on 15-20-ft. spacing)			
arroyo willow	<i>Salix lasiolepis</i>	1	35
arroyo willow	<i>Salix lasiolepis</i>	2	10
western sycamore	<i>Platanus racemosa</i>	3	8
western sycamore	<i>Platanus racemosa</i>	15	2
Subtotal Trees			55
Shrubs (quantity based on 20% shrub cover assuming a 3 ft. diameter)			
blackberry	<i>Rubus ursinus</i>	1	40
blackberry	<i>Rubus ursinus</i>	2	10
wild rose	<i>Rosa californica</i>	2	50
mugwort	<i>Artemesia douglasiana</i>	1	60
saltbush	<i>Atriplex lentiformisbreweri</i>	5	10
saltbush	<i>Atriplex lentiformisbreweri</i>	1	10
cliff aster	<i>Malacothrix saxatilis</i>	2	20
Subtotal Shrubs			200

Cages will be constructed of hardware cloth (1 ft. x 2 ft.) for all herbs and shrubs to protect them from rabbits and ground squirrels (Figure 3). Approximately 255 plants will require anti-herbivore cages. These cages will be held in place with two staples each. Trees and large woody shrubs will have two slow-release fertilizer tabs placed in the bottom of each planting hole. Upon completion of installation, all plants will be deep watered.

3.4 Planting Specifications

The following planting specifications will be followed:

- 1) Dig holes with posthole digger or auger—field test. Dig at least 1 ft. deeper than the plant container.
- 2) Place two Gro-tabs® in bottom of hole.
- 3) Add mulch to soil in bottom of planting hole.
- 4) Install root cage and backfill to depth of pot.
- 5) Pre-soak planting hole.
- 6) Install plant, filling hole with pulverized native soil.
- 7) Water plant.
- 8) Install anti-herbivore cage using 2 staples to tack down.
- 9) Place mulch (minimum thickness 6 inches) over entire riparian reveg. area.
- 10) Replace pin flag next to plant.

3.5 Planting Locations

Planting sites will be field-sited by a botanist/plant ecologist using color-coded flags. Tree planting (arroyo willow, western sycamore) will be spaced 15-20 ft. apart to allow for future growth. Understory shrubs (wild rose, mugwort, and blackberry) will be planted in groupings of the same species and will be spaced 3-5 ft. apart. A few upland species (saltbush and cliff aster) will be planted along the edge of the gravel road to provide transitional habitat.

3.6 Maintenance

Planting will occur in January/February 2003 to take advantage of winter rainfall. The watering schedule will be adjusted to consideration of climatic conditions. We recommend that supplemental watering be performed once a week until plants are established, or for 3-4 months. To facilitate this, a temporary drip irrigation system will be installed on the site, drawing water either from the Venoco facility or an extension of existing irrigation infrastructure from the adjacent restoration area. After establishment, the frequency of watering should be decreased to biweekly until the beginning of the rainy season (November) or when natural rainfall becomes adequate. The heavy mulch may allow for less-frequent watering of the plants, to be determined by the landscape contractor. Second-season watering may or may not be required depending on the amount of rainfall received that winter.

We anticipate that some minor weed removal will be required in the riparian revegetation area to aid establishment of the newly installed plants during the maintenance period and that this work will be performed once a month for the first 3-4 months and every other month thereafter until the end to the first year. After the first year, weed eradication will be performed twice a year in the spring and fall. Weed eradication in the weed abatement area will be performed quarterly for the first year after initial planting and twice a year in the spring and fall of the second year. No follow-up weeding or maintenance will be performed in this area.

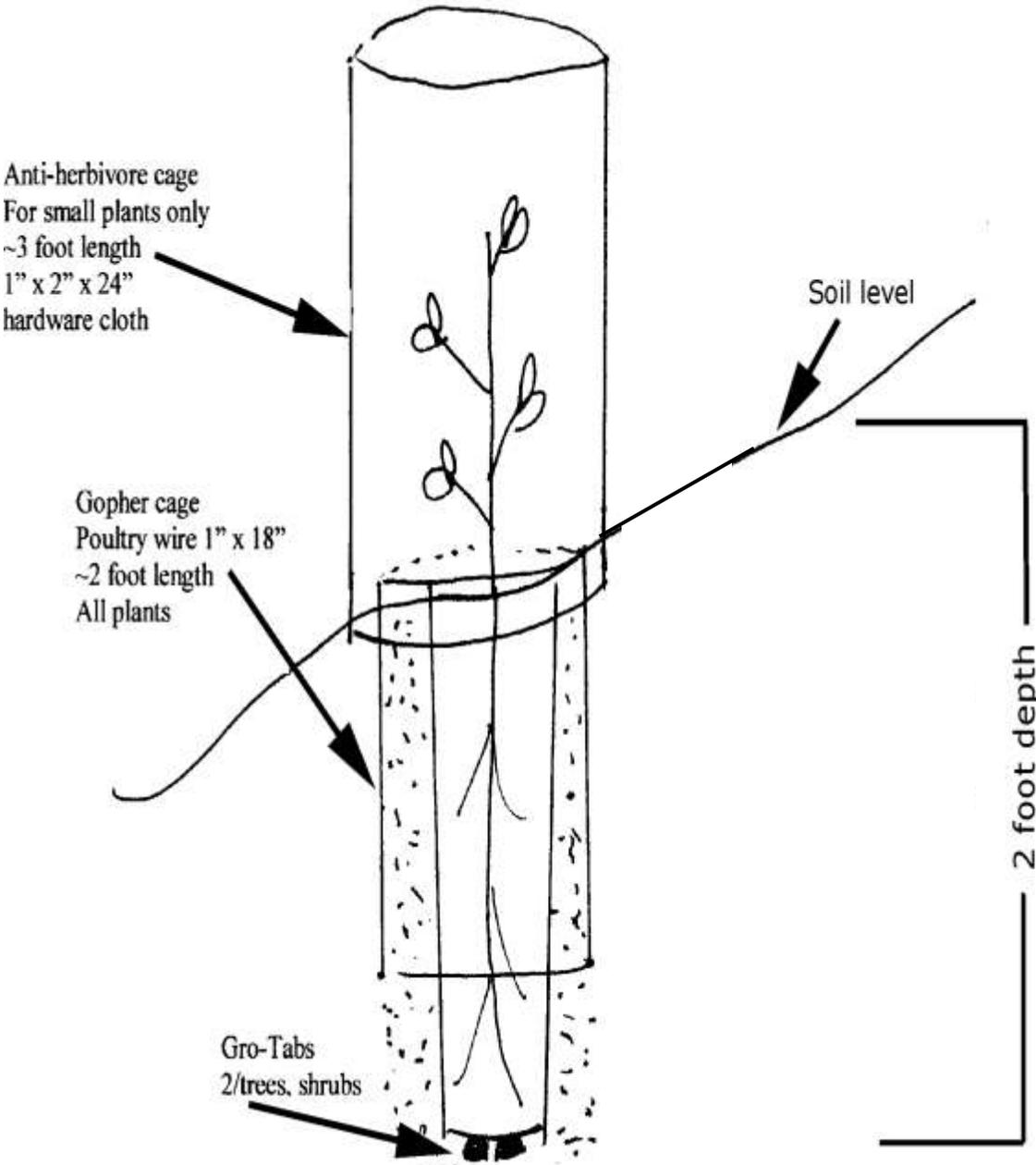


Figure 3. Tree and Shrub Planting Diagram

3.7 Access Restrictions, Ownership & Easements

We do not anticipate the need to protect the site from public encroachment. The only access to the site is via the 421 Lease access road, which is gated to prevent unauthorized access, or through the Venoco Ellwood Gas Processing Plant. As previously mentioned, the site is zoned for recreational use and is protected from future development. The Santa Barbara County Coastal Plan also prohibits development within 100 ft. of a wetland. The only other easements and/or activities that could potentially affect the site are flood control maintenance activities. The Santa Barbara County Flood Control Department shall be notified of the wetland mitigation area to prevent inadvertent damage to the site.

3.8 Project Schedule

Venoco, Inc. is committed to securing the resources necessary to implement the plan as soon as it is approved by the agencies. Ideally, site preparation work and weed eradication could be performed this fall and the plantings installed this winter after the first good (i.e., greater than ¾-in.) rain of the season. We anticipate that maintenance activities will need to be performed once a month for the first 3-4 months and bi-monthly until the end of the first year. We recommend that additional and replacement plantings be installed in spring of 2003 as part of a follow-up maintenance contract. This work would also include the addition of mulch as necessary, and supplemental weeding in the early spring, late spring, and fall. Weed eradication in the weed abatement area will be performed for a period of two years following the initial weed removal. Weed eradication in the riparian revegetation area will be performed twice a year until successful attainment of the performance goals is met, or unless deemed unnecessary by the Energy Division monitoring biologist.

4.0 PERFORMANCE STANDARDS

Performance standards are the measure of how well a project is meeting the goals and objectives of the program and/or plan. The goal of the restoration site is to provide a significant weed-free period during which the native species will be able to increase in cover significantly enough to become dominant. This goal of zero percent cover of weeds during the monitoring period should be attainable and will likely provide the necessary level of success for the mitigation site.

4.1 Trees & Shrubs

Trees shall have a minimum survival of 85% after the first year. Should survival be less than 85%, additional plantings will be installed during the second year to bring the total number of tree plantings up to 85% of the total number originally planted. Replantings need not be of the same species as were lost, provided they are chosen from among the native species used in this study. After the second year, tree survival should be at least 80% of the number originally planted. Should numbers decline below 80% at any time during the five-year monitoring period, additional plantings shall be performed to bring the total number up to 80%. Tree planting will be deemed a success if after five years 80% of the original number of trees planted are still alive and the trees have attained a minimum height of 8 ft. measured along the main trunk and/or stem.

The success of shrub plantings is more difficult to quantify. Some shrubs are relatively short lived, such as cliff aster, and others, such as wild rose and blackberry, spread by rhizomes, making individual tallies impossible. The success of shrub planting in this project shall be based on presence or absence of species planted and a visual estimate of the percent cover. All species originally planted should be present in some number after the first and second years. The total percent shrub cover should increase by 10% each year until the absolute cover reaches at least 50% after five years. Should the percent cover fall below 10% at any time after the second year, additional shrub plantings shall be performed.

4.2 Weed Control

Within the riparian revegetation area, the monitoring biologist should identify weed species and perform a visual estimate of the absolute cover of weeds. Weed cover should not exceed 20% at any time during the monitoring period. Should weed cover exceed 20%, additional weed abatement shall be performed.

Within the weed abatement area, weed growth after the two-year weed removal period is expected to increase gradually over time as weeds reinvade the site from upstream areas. The treatment of this area is intended to provide an opportunity for native vegetation to grow without competition from the weeds and, hopefully, establish greater dominance. Given this fact, no performance standards are proposed for the weed abatement area.

4.3 Wetland Functions

The monitoring biologist assessing the performance of tree, shrub, and weed control measures shall indirectly assess the performance of wetland functions. The monitoring biologist should also take note of any increase in wildlife utilization within and adjacent to the restoration site. An increase in wildlife utilization or use of the site by birds for nesting would indicate a positive increase in the overall wetland functions.

5.0 ADAPTIVE MANAGEMENT

In this situation, adaptive management is a process for improving the wetland mitigation plan and implementation by learning from the outcome as it is reported. Adaptive management can be a useful tool for dealing with unexpected outcomes. An example of this would be the failure of all cliff aster plantings in the riparian revegetation area. Should this situation occur, the reason for the failure should be investigated and a decision reached whether or not to attempt replanting this species.

5.1 Approval Process

The first step in the approval process is to identify the problem. We anticipate that the monitoring biologist and/or landscape contractor performing the installation and site maintenance will be the first to identify the problem and bring it to the attention of the project applicant and the City Energy Division. A team approach should then be used to identify potential causes of the problem and creative solutions. A range of options should be considered and the economic and ecological merits of all options considered. The City will have the final decision on which solutions to the problem are acceptable and in keeping with the goals and objectives of the plan.

5.2 Remedial Measures

The City will decide which remedial measures are acceptable, but the choice of which to implement shall be left to the project applicant and shall be monitored by the City as necessary to ensure proper implementation. The City and applicant shall also agree in writing to any additional required monitoring and/or changes in the performance standards.

6.0 PROJECT MANAGEMENT

6.1 Installation Oversight

The physical implementation of this plan will be performed in three steps: 1) site preparation (i.e., weed abatement), 2) revegetation (i.e., plant installation, mulching, and installation of drip irrigation), and 3) post-installation maintenance (i.e., weed abatement, watering, and plant replacement).

Watershed Environmental biologists will oversee the first two steps to ensure that work performed by the landscape contractor meets the mitigation plan specifications and contractual agreement. The last step will be overseen by Venoco, Inc.'s Ellwood gas processing plant personnel and may also be inspected by an Energy Division monitoring biologist.

6.2 Project Funding

This project will be completely funded by Venoco, Inc. for its duration (estimated to be five years from planting date). Costs include site preparation, revegetation, post-installation maintenance, and environmental compliance monitoring and reporting.

6.3 Commitment and Responsibility

Venoco, Inc. is ultimately responsible for ensuring the success of this wetland mitigation plan and for the commitment of the necessary financial resources to implement it. Venoco understands its responsibility and will make every effort to comply with the County and California Coastal Commission 421 Lease emergency permit condition requirements as they pertain to this plan. Venoco's project manager responsible for ensuring plan implementation is Mr. Steve Greig (805-745-2100).

7.0 MITIGATION MONITORING

In addition to the oversight provided by Venoco, Inc., independent mitigation monitoring will be performed by Energy Division compliance monitors. The purpose of this monitoring is to document implementation of the mitigation plan, agency permit condition compliance, and revegetation performance. This documentation will also be used should issues arise requiring adaptive management.

The monitor assigned to this project shall be a professional biologist--preferably one with some knowledge of botany and plant ecology. Environmental monitors shall report directly to Energy Division staff. Project site visits by monitors shall be coordinated with Venoco personnel at the Ellwood gas processing plant. Due to site safety regulations, monitors may be asked to sign in at the processing plant so that their presence and whereabouts are known in the event of an emergency.

7.1 Methodology

Monitoring will be performed by visually inspecting the site and recording qualitative site conditions and quantitative measures of performance.

Qualitative observations in the riparian revegetation area shall include human or other disturbance, wildlife activity, soil conditions, and activities adjacent to the project site that are affecting or may in the future affect the site. Observations in the weed abatement area shall be limited to recording the presence and absence of weeds and the relative effectiveness of weed abatement activities.

Quantitative measures will include an accounting of all trees planted in the revegetation site, any mortality, and average height. A visual estimate of the absolute shrub cover and weed cover shall also be performed. Cover estimates shall measure the aerial extent of unvegetated ground and shrub and weed cover to the nearest 5% within a circular area with a diameter of 11.3 ft. (100-sq.-ft. area). A total of 20 spatially stratified random sampling points within the riparian revegetation area shall be surveyed using this methodology. The sampling results shall be reported by averaging the shrub, weed, and bare-ground cover in the 20 sampling locations and shall include a statistical summary of the minimum, maximum, and standard deviation. Sample replication should be sufficient to provide a 90% confidence interval no greater than 15% of the mean.

7.2 Schedule

Monitoring shall be performed twice a year after planting in the spring (March-April) and fall (November). After the end of the second year, monitoring shall be performed annually in the spring (March-April) until successful attainment of the performance goal is met.

7.3 Reporting

An annual report summarizing the monitoring results and size of the area of successful mitigation shall be prepared by the monitoring biologists and submitted to the County Energy Division, City of Goleta, California Coastal Commission, and Venoco, Inc. by December 15th of each year.

8.0 REFERENCES AND LITERATURE CITED

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County of Santa Barbara. 1993. *Goleta Community Plan, Final*. Resource Management Department: Santa Barbara, California.

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September 21, 2005

Mark de la Garza
Watershed Environmental
1103 E. Clark Ave., Suite F-6
Orcutt, CA 93455

RE: Review of Third Annual Monitoring Report – State Lease 421 Wetland
Mitigation Project

Dear Mark,

The Energy Division received the Venoco State Lease 421 Wetland Mitigation Third Annual Monitoring Report, dated May 20, 2005. In consultation with On-site Environmental Coordinator John Storrer, and on behalf of the City of Goleta, we have reviewed the report for compliance with the original State Lease 421 Final Wetland Mitigation Plan. Please consider the following comments.

Summary of Results

The report is comprehensive and contains a sufficient level of detail regarding monitoring activity for Spring 2005. The report provides thorough documentation of revegetation progress, including actions undertaken over the previous year to promote successful revegetation. These consist generally of periodic maintenance and monitoring of the restoration site.

Monitoring results demonstrate continued progress toward restoration objectives, including tree growth, high overall vegetative cover, and plant survival. Of particular note are the rate of attrition of planted trees (well within established thresholds), and very good documented values for vegetative cover and weed cover.

Recommendations

Please remove the irrigation system and protective wire cages as soon as possible. In most cases, the enclosures (cages) should have been removed months ago, as recommended in previous progress reports.

Tree survival and growth is such that all but nine trees have satisfied the pre-established height requirement. In view of this fact, we support limiting future surveys to a qualitative assessment of all trees for general health and vigor, and more specific quantitative measurement of the nine trees that have not yet met the performance standard.

In addition, a qualitative assessment of shrub cover will suffice for subsequent surveys. However, if it appears (for whatever reason) that relative shrub cover has fallen to a level approximating the 50% minimum value, then a more quantitative evaluation should be performed.

A visual or qualitative assessment of weed growth in the primary revegetation area would also be acceptable in the future. Again, if the occurrence of weeds appears to approach the 20% relative cover threshold, a more quantitative evaluation should be performed. Alternatively, the weeds could simply be removed.

It appears from the discussion on Page 6, 3rd paragraph, that weed eradication efforts in the “weed abatement area” are not entirely effective. The mitigation plan requires another two years of weed control. If it appears that this aspect of the program will be ultimately unsuccessful, an alternate strategy should be considered at this time. Mulching (in conjunction with tree and shrub planting) has been extremely successful in the primary restoration site. Mulching, or perhaps another alternative to simply hand-weeding, might increase the effectiveness of the weed eradication efforts.

Scheduling

In accordance with the original State Lease 421 Final Wetland Mitigation Plan dated January 2003: “Monitoring shall be performed twice a year after planting in the spring (March-April) and fall (November). After the end of the second year, monitoring shall be performed annually in the spring until successful attainment of the performance goal is met.” The end of the second year was approximately March 25, 2005. Therefore the next monitoring should be performed in Spring 2006.

Conclusions

Overall, the mitigation program is proving to be successful. As described previously, some of the quantitative monitoring requirements may be substituted with qualitative methods, as long as shrub cover and weed cover remain within acceptable limits (specified above).

At this time, the protective wire cages around plants and the irrigation system should be removed. Also, weed eradication methods should be re-evaluated, with mulching possibly serving as a superior alternative to hand-weeding. Please contact John Storrer at (805) 682-2065 to discuss any such alterations to the weed eradication approach.

If you should have any further questions, please feel free to call me at (805) 568-2853.

Sincerely,

Andrea Chadden
Planner

cc: John Storrer, EQAP On-site Environmental Coordinator
Ken Curtis, City of Goleta
Steve Greig, Venoco, Inc.

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