CLEAN WATER ACT SECTION 404 (B) (1) ALTERNATIVES ANALYSIS
DUTRA HAYSTACK ASPHALT PLANT PROJECT
PETALUMA, SONOMA COUNTY, CA
(U.S. ARMY CORPS OF ENGINEERS FILE NO. 28104N)

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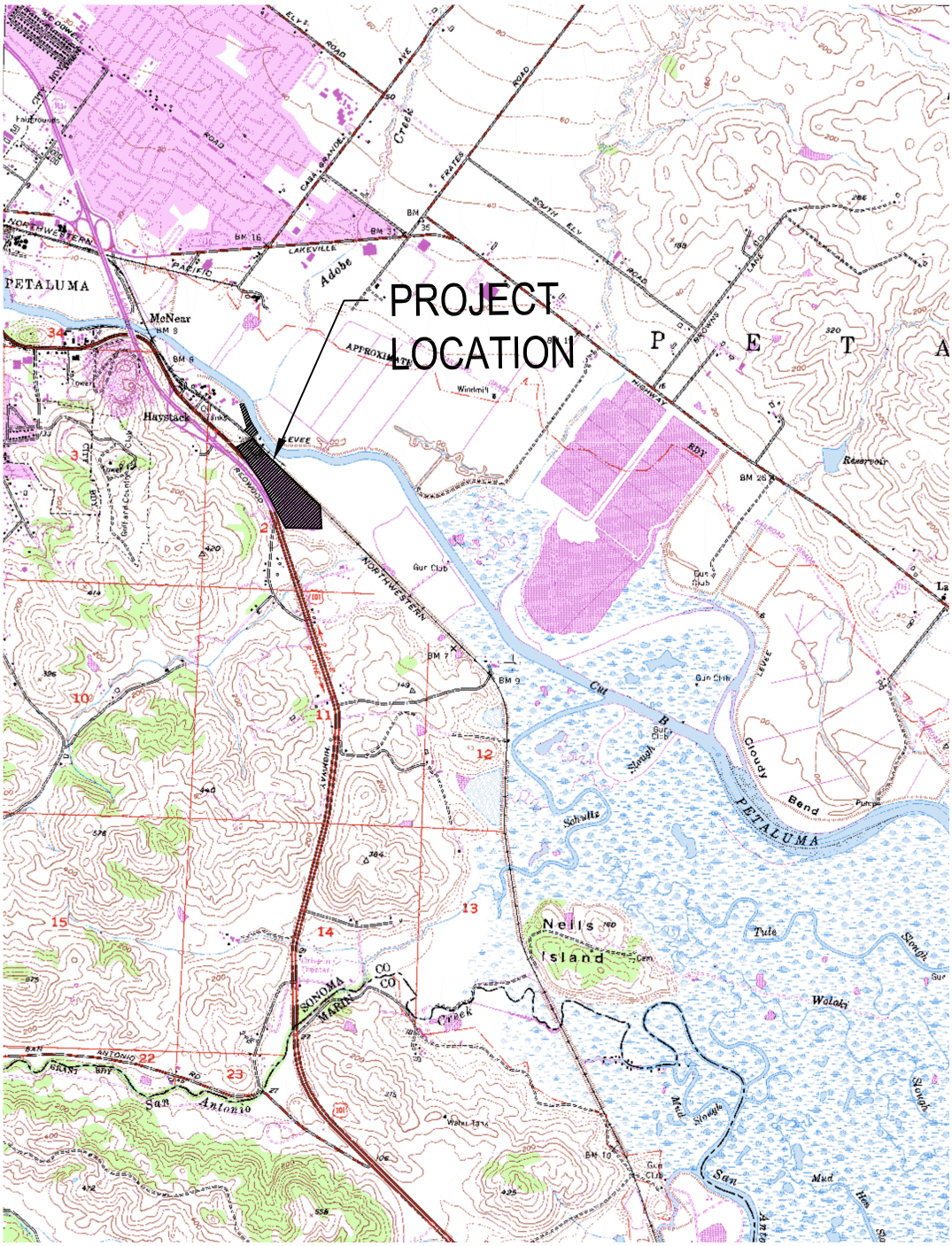
1.0 Introduction

The purpose of the Clean Water Act Section 404 (b)(1) Guidelines (40 CFR 230) is to restore and maintain the chemical, physical and biological integrity of waters of the United States through the control of discharges of dredged or fill material. A fundamental component of the Guidelines is that dredged or fill material should not be discharged into wetlands unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact individually or collectively on the environment. The 404(b)(1) Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse effects. The environmental document for any project that requires an Individual 404 permit from the USACE must include an alternatives analysis that identifies the Least Environmentally Damaging Practicable Alternative (LEDPA).

Practicable as defined in Section 230.10 (a)(2) of the Guidelines, means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose.

2.0 Site Description

The Haystack Landing project site consists of three parcels (Figure 1). Two of these parcels comprise the main Haystack site that covers approximately 35 acres directly east of Highway 101 and South Petaluma Boulevard. These are APN 019-320-023 (covering over 4 acres) in the northern portion of the site and APN 019-320-022 (covering approximately 29 acres) in the southern portion of the site. A third parcel, APN 019-320-001 (covering 0.86 acre), is located east of APN 019-320-023 and east of the railroad tracks and fronts the Petaluma River. Of the 35-acre site, the northern half of the property occurs primarily as non-native grasslands and ruderal habitat. The southern 19 acres is comprised of abandoned silt ponds historically used for the washing of quarry aggregates. The lower depressions of these silt ponds have developed into seasonally inundated wetlands over most of that area. The parcel fronting the Petaluma River may be classified as ruderal and has a tidally influenced swale bisecting it. A thin band of coastal marsh occurs on the river's edge.



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DUTRA HAYSTACK ASPHALT FACILITY
USGS MAP
OVERALL SITE PLAN

SONOMA FIGURE 1 CALIFORNIA

CSW | ST2

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3.0 Project Description

The proposed Dutra Haystack Asphalt Plant project includes a new asphalt plant and associated stockpiles of rock and sand used as raw material for the asphalt and also sold for base and other aggregate products. These stockpiles will include processed recycled asphalt, which is an integral component for manufacturing recycled asphalt pavement (RAP).

The new asphalt plant, which will be located on the northern portion of Parcel A, will consist of a 6-product cold feed bin assembly, a 400 ton per hour counter flow drum mix assembly, twin oil storage tanks, four 100 ton storage silo assemblies, a heating oil plant, and a truck scale. An operator's compartment and electrical motor control will also be incorporated into the plant. This facility will meet seismic standards, as well as blue smoke and related emission requirements.

To provide aggregate for the asphalt plant, Dutra will use the current Shamrock Material, Inc. Landing Way off-loading facility on the west bank of the Petaluma River. The aggregate will be transported by barge to the Shamrock off load facility. A conveying system will be erected to transport materials from the off-load facility to the plant site on the 35-acre parcel to the southwest. The total footprint of ground disturbance to support the asphalt plant and associated features is approximately 4.5 acres.

The existing barge offloading equipment at the Shamrock Facility includes an "e-crane" which is operated from the shore and reaches onto the barge to unload the aggregate from the barge. The aggregate is placed into a hopper by the e-crane. From the hopper, the aggregate is transferred to the conveyor, which carries the material approximately 670 feet towards the Sonoma Marin Area Rail Transit (SMART) right-of-way. The next leg of the conveyor belt is approximately 120 feet long and rises to provide 24 feet of clearance to cross the railroad tracks. This height is necessary to allow standard trains to pass underneath the conveyor. After crossing the railroad, the conveyor system will take the material 390 feet in a southeasterly direction roughly parallel to the railroad. This conveyor will sit on top on the hill and remain approximately level until it crosses over the former residential access road. At the end of this conveyor, the stockpile distribution system will separate the material into the appropriate stockpiles. This will allow the most efficient storage of material on the site.

A small office complex, consisting of a reception and weigh-master area, an operations office, and a conference room area will also support the facility.

3.1 Wetland Impacts and Mitigation

This section describes existing wetland habitats on the site, potential impacts, and associated mitigation.

3.1.1 Existing Wetland Habitats

On November 7, 2003 and October 18, 2008 the San Francisco District of the U.S. Army Corps of Engineers conducted a jurisdictional determination on the project site. In total, approximately 12.62 acres of jurisdictional wetlands and waters of the U.S. were identified on project site.

Since 2008, the existing acreage of the larger parcel adjacent to Highway 101 has been reduced by approximately 2.29 acres with construction of the Marin-Sonoma Narrows Caltrans Project, which occurred on the western portion of the site near the Petaluma Boulevard South off-ramp. The improvements within the Caltrans right of way resulted in the filling of approximately 0.45 acres of existing wetlands on the Haystack Landing site. As a result of this impact, the total wetland area on the Haystack site was reduced to 12.17 acres (see Plate 1). The wetland areas on the site are described below and delineated on Plate 1.

Drainage Ditches

Several drainage ditches occur on the project site. Most of these ditches support shallow pools of standing water and two of the drainage ditches appear to be tidally influenced. Illustrated on Plate 1 as drainage ditch DD1 and drainage ditch DD2 in the central portion of the property, these areas drain into a larger drainage ditch along the railroad tracks that parallels the eastern property boundary. The drainage ditch within the railroad easement is outside the project area and therefore is not mapped on the project site. Aerial photograph review indicates that the railroad ditch drains to the Petaluma River via a tidally-influenced slough.

A smaller drainage ditch, delineated as drainage ditch DD3, parallels the southern property line for approximately 500 feet and is approximately 3 feet wide as shown on Plate 1. Saturated soils were observed in March 2003 in the eastern portion of the ditch where it connects to a pond located east of the property. This area also appears to be marginally tidally influenced.

The remaining ditches (drainage ditches DD4 and DD5) are probably brackish given the vegetation composition of cattail and pickleweed. However, it appears that the most

northern of the ditches (drainage DD6) may convey and contain freshwater as there is no evidence of a direct hydrologic connection to any of the other tidally influenced ditches on the project site and the vegetation growing in drainage ditch DD6 consists of cattails

In total, the ditches on Parcel A cover approximately 1.53 acres subject to Corps jurisdiction.

Seasonally Inundated Wetlands

A total of nine seasonally inundated wetland areas were identified on Parcel A ranging in size from 0.07-acre to 4.0 acres as illustrated on Plate 1. All of these areas occur within areas defined by the former siltation ponds.

Wetland A is located in the middle of the site and covers approximately 1.09 acres. This wetland area appears to occasionally support standing water for a significant period of time during the growing season.

Other wetlands on the site include a small seasonal wetland (Wetland I) covering 0.03-acre and wetlands B, C, and D that occur on the southern portion of the site. Wetland B is the largest of these areas (measuring 4.0 acres) and during the rainy season supports standing water in the eastern portion where it connects to a small ditch that drains to the ditch adjacent to the railroad tracks east of the project site.

Wetlands C and D (covering 0.08 and 0.39-acre respectively) are located north of Wetland B.

Wetlands E through H occur on the southern portion of the site just east of Highway 101. These areas range in size from 0.07 to 3.51 acres as shown on Plate 1.

A small pond that supports several feet of standing water is located at the northwestern edge of Wetland H and is connected to drainage ditch DD2 (which is tidally influenced) via a small culvert that passes under a levee road. Wetlands A through I cover a total area of 10.06 acres subject to Corps jurisdiction.

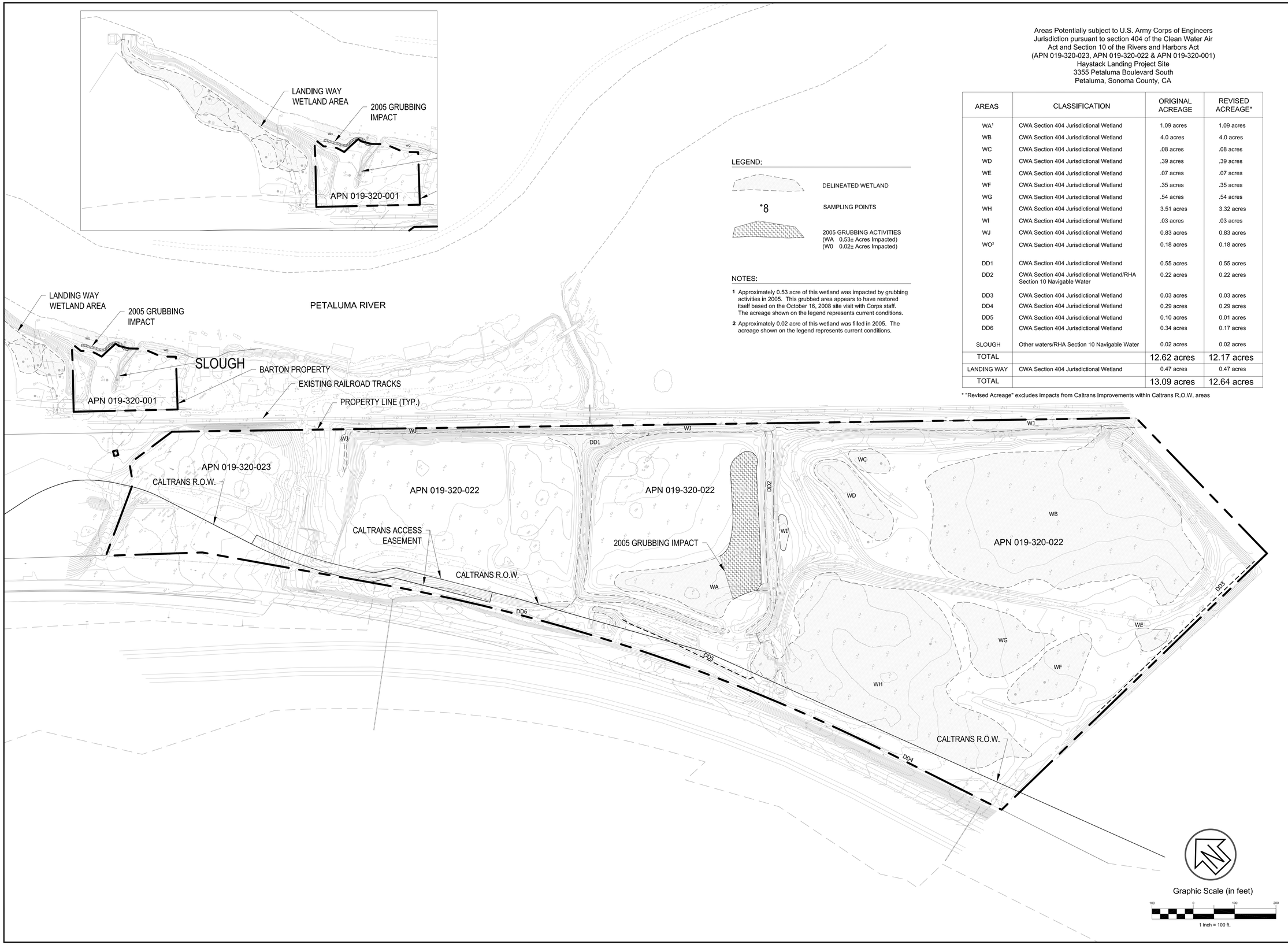
Parcel East of the NWP Tracks

A jurisdictional wetland delineation was conducted on this parcel on January 21, 2004 after this parcel was included as part of the proposed project. One remnant slough occurs on this parcel and measures approximately 110 feet in length and approximately 6-8 feet in width, covering a total area of approximately 0.02 acre potentially subject to Corps

jurisdiction. In addition, approximately 200 linear feet of coastal brackish marsh averaging about 20 feet wide occurs on the eastern boundary of this parcel directly adjacent to the river. In January 2004 it was determined that approximately 0.10 acre of coastal brackish marsh habitat occurs on the parcel.

Portion of Landing Way

A portion of the Landing Way off-loading facility, approximately 0.47 acre, will be used to off-load materials and transfer them by an electric conveyor to Parcel A for use in creating asphalt. The existing Landing Way facility fronts the Petaluma River and is immediately north of Parcel B. The area to be impacted by construction of the conveyor belt is a seasonal wetland mitigation area supporting primarily non-native wetland grasses. The San Francisco Corps confirmed on December 14, 2010 that this mitigation area covered 0.47 acre subject to Corps jurisdiction.



Areas Potentially subject to U.S. Army Corps of Engineers Jurisdiction pursuant to section 404 of the Clean Water Air Act and Section 10 of the Rivers and Harbors Act (APN 019-320-023, APN 019-320-022 & APN 019-320-001)
Haystack Landing Project Site
3355 Petaluma Boulevard South
Petaluma, Sonoma County, CA

AREAS	CLASSIFICATION	ORIGINAL ACREAGE	REVISED ACREAGE*
WA[1]	CWA Section 404 Jurisdictional Wetland	1.09 acres	1.09 acres
WB	CWA Section 404 Jurisdictional Wetland	4.0 acres	4.0 acres
WC	CWA Section 404 Jurisdictional Wetland	.08 acres	.08 acres
WD	CWA Section 404 Jurisdictional Wetland	.39 acres	.39 acres
WE	CWA Section 404 Jurisdictional Wetland	.07 acres	.07 acres
WF	CWA Section 404 Jurisdictional Wetland	.35 acres	.35 acres
WG	CWA Section 404 Jurisdictional Wetland	.54 acres	.54 acres
WH	CWA Section 404 Jurisdictional Wetland	3.51 acres	3.32 acres
WI	CWA Section 404 Jurisdictional Wetland	.03 acres	.03 acres
WJ	CWA Section 404 Jurisdictional Wetland	0.83 acres	0.83 acres
WO[2]	CWA Section 404 Jurisdictional Wetland	0.18 acres	0.18 acres
DD1	CWA Section 404 Jurisdictional Wetland	0.55 acres	0.55 acres
DD2	CWA Section 404 Jurisdictional Wetland/RHA Section 10 Navigable Water	0.22 acres	0.22 acres
DD3	CWA Section 404 Jurisdictional Wetland	0.03 acres	0.03 acres
DD4	CWA Section 404 Jurisdictional Wetland	0.29 acres	0.29 acres
DD5	CWA Section 404 Jurisdictional Wetland	0.10 acres	0.01 acres
DD6	CWA Section 404 Jurisdictional Wetland	0.34 acres	0.17 acres
SLOUGH	Other waters/RHA Section 10 Navigable Water	0.02 acres	0.02 acres
TOTAL		12.62 acres	12.17 acres
LANDING WAY	CWA Section 404 Jurisdictional Wetland	0.47 acres	0.47 acres
TOTAL		13.09 acres	12.64 acres

* "Revised Acreage" excludes impacts from Caltrans Improvements within Caltrans R.O.W. areas

LEGEND:

DELINEATED WETLAND

*8 SAMPLING POINTS

2005 GRUBBING ACTIVITIES
(WA 0.53± Acres Impacted)
(W0 0.02± Acres Impacted)

NOTES:

1 Approximately 0.53 acre of this wetland was impacted by grubbing activities in 2005. This grubbed area appears to have restored itself based on the October 16, 2008 site visit with Corps staff. The acreage shown on the legend represents current conditions.

2 Approximately 0.02 acre of this wetland was filled in 2005. The acreage shown on the legend represents current conditions.

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Rev	Date	Description	Designed	Drawn	Checked
-	04-29-15	CALTRANS IMPACTS REMOVED	RSW	RSW	AGC
-	10-23-08	WETLAND DELINEATION MAP	RSW	RSW	AGC

DUTRA HAYSTACK LANDING
POTENTIAL JURISDICTIONAL WETLANDS
DUTRA GROUP

City Of

County Of
Sonoma

State Of
California

Prepared Under the Direction of:

Sheet
EXH9

Scale:	1" = 100'
Date:	10-23-08
File:	591302-C3D
Plan File:	D-4862

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3.1.2 Wetland Mitigation

Of the 12.17 acres of wetlands identified on the site, over 10 acres will be avoided with project implementation. Construction of the proposed asphalt plant will result in the filling of approximately 1.37 acre of seasonally inundated wetland subject to U.S. Army Corps of Engineers (Corps) jurisdiction pursuant to Section 404 of the Clean Water Act. In addition, transferring aggregate materials from the barges via the electronic conveyor at the off-loading facility will involve the decommissioning of an existing mitigation wetland that covers approximately 0.47 acre.

The proposed mitigation program calls for a total of 11.26 acres of enhanced and created wetland habitat designed to mitigate for the wetlands impacted by the proposed asphalt plant and impacts to the Landing Way mitigation area.

To complement the wetland creation and enhancement projects, an additional 2.54 acres within the wetland mitigation area on the 35-acre parcel will be planted with native trees and shrubs to provide wildlife habitat and to serve as a natural buffer to the proposed asphalt industrial facility. Another 0.29 acre of upland buffer will be planted with native trees and shrubs on the Landing Way site. This buffer will be on the east side of the Landing Way property along an existing earthen berm that will provide a buffer between the loading facility and the coastal brackish marsh on the Petaluma River.

3.2 Basic Project Purpose

The basic project purpose comprises the fundamental, essential, or irreducible purpose of the project. The basic project purpose is to construct a new asphalt plant and associated features.

3.3 Overall Project Purpose

The overall project purpose serves as the basis for the Section 404(b)(1) alternatives analysis, and is determined by further defining the basic purpose in a manner that more specifically describes the applicants goals for the project, while allowing a reasonable range of alternatives to be analyzed. The overall project purpose for the project is to provide recycled asphalt pavement (RAP) and aggregate and sand products to be used for public and private construction projects in northern and western Marin and southern Sonoma County. Aggregate and sand are inherently heavy materials that are bulky and difficult to move. To accomplish the project goals of delivering these products

to the market area efficiently and cost effectively, the plant needs to be located within a reasonable distance from its potential market.

4.0 Process for Evaluating Practicability of Alternatives

The Dutra Group evaluated a variety of alternatives to the proposed Dutra Haystack Asphalt Plant Project (Proposed Project) to identify alternatives that would meet the project objectives of constructing an asphalt plant that would serve parts of southern Sonoma County and northern and western parts of Marin County. Eight off-site alternatives and a No Project alternative were evaluated to determine if they are practicable alternatives. The Originally Proposed project that included a loading dock on the west bank of the Petaluma River at the Haystack Landing site was also included in the analysis. Each of these alternatives was then further evaluated to determine if it would have fewer impacts to waters of the United States and less damaging adverse environmental impacts than the other alternatives. The alternative that met the overall project purpose, had the least impacts to waters of the U.S., and had the least damaging adverse environmental impacts would be identified as the Least Environmentally Damaging Practicable Alternative (LEDPA).

The alternatives evaluated include:

- ❑ Alternative A: Originally Proposed Project (On-site Alternative)
- ❑ Alternative B: Proposed Project
- ❑ Alternative C: No Project Alternative
- ❑ Alternative D: Sonoma County Landfill
- ❑ Alternative E: Port Sonoma
- ❑ Alternative F: Redwood Landfill
- ❑ Alternative G: Downtown Petaluma
- ❑ Alternative H: Pomeroy Site
- ❑ Alternative I: Lakeville Highway Site
- ❑ Alternative J: Temporary Dutra Site

The first step of the analysis was to determine if each alternative met the basic project purpose. The basic project purpose for the Proposed Project is to construct a new asphalt plant and associated features. If the alternative did not meet the basic project purpose, it was dismissed from further consideration. The second step of the analysis was to determine if each alternative met the overall project purpose. The overall project purpose is to replace an asphalt plant and to provide aggregate products to serve public and private construction projects in southern Sonoma County and northern and western Marin County. If the alternative did not meet the overall purpose it was

dismissed from further consideration. If the alternative met the overall project purpose it then was evaluated for its practicability.

The next step of the analysis involved evaluating technological and logistical constraints to identify the practicability of each alternative. Practicable as defined in Section 230.10 (a)(2) of the CWA 404 (b)(1) Guidelines, means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose. As part of this step, a number of technological and logistical constraints related to the efficient delivery of asphalt to the defined market area were considered to determine the practicability of each alternative. These technological and logistical constraints directly correlate to the cost of constructing an asphalt plant, which determines the practicability of the project.

The last step of the analysis was to determine which of any of the practicable alternatives identified would have the least impact to waters of the United States and less damaging adverse environmental impacts.

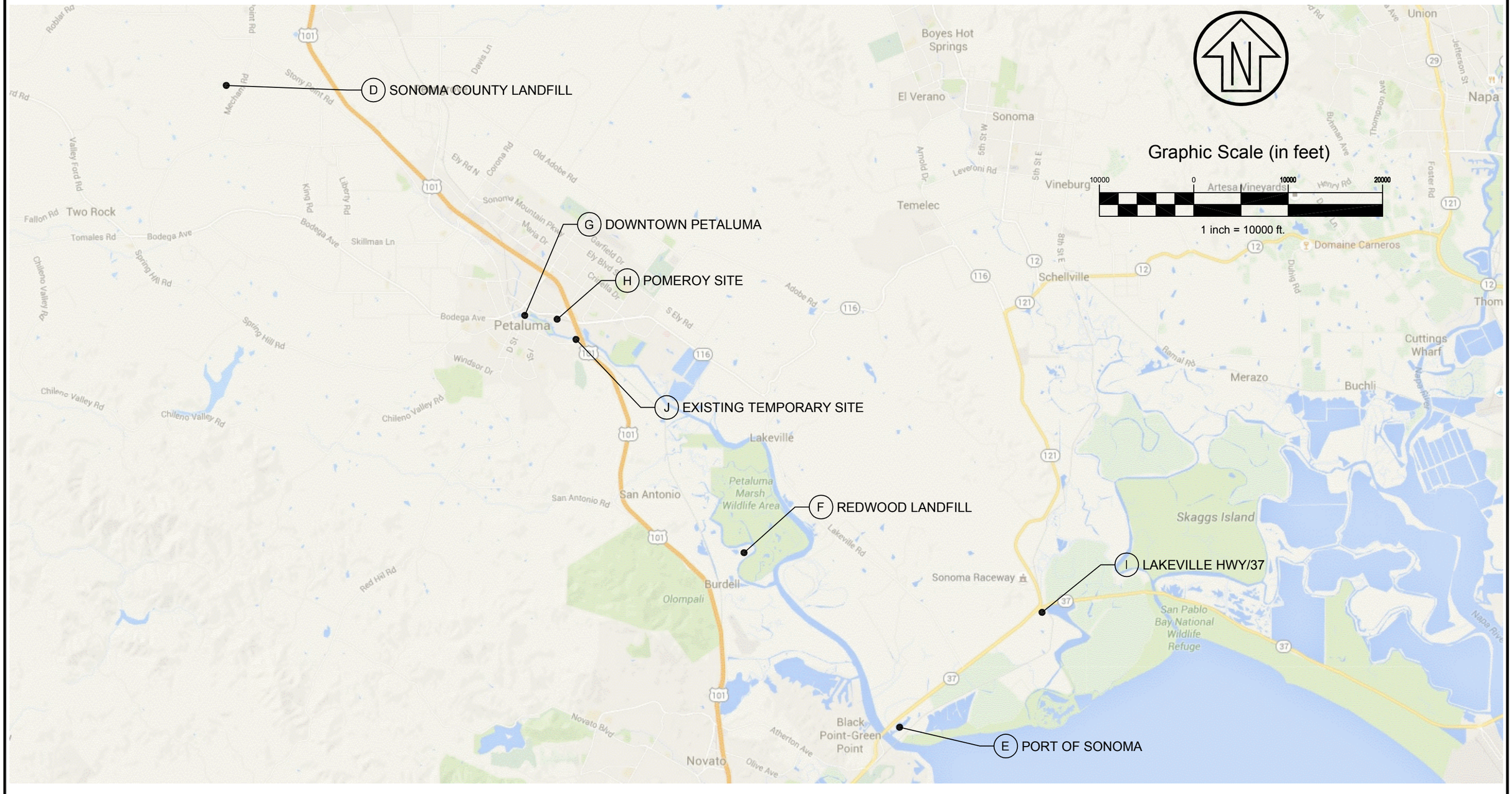
Table 1 presents the results of the 4-step process in evaluating alternatives. Table 2 represents costs associated with constructing an asphalt plant under each alternative.

5.0 Evaluation of Alternatives

This section discusses the various alternatives considered and if these alternatives can meet the basic and overall purpose of the project and are practicable. The alternatives include the Originally Proposed Project, a No Project alternative and eight off-site alternatives. The off-site alternative locations considered for the Dutra Haystack Asphalt Plant project are illustrated on Figure 2.

5.1 Originally Proposed Project (A)

The Originally Proposed Project included an off-loading facility on the west bank of the Petaluma River. This alternative would have included construction of a pier and dock to facilitate the unloading of materials for use in asphalt production. While this alternative would have met the basic and overall purpose of the project, the U.S. Coast Guard determined that the proposed dock would encroach into the navigable channel and therefore would not be permitted. Therefore, this alternative was rejected because of this logistical constraint. The Originally Proposed Project was redesigned to what is now the Proposed Project.



Rev	Date	Description	Checked
-	10/12/2016	ISSUED FOR ALTERNATIVES ANALYSIS	XXX

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Job No. 591302

Date: 12/30/2015

Scale: 1" = 10,000'

HAYSTACK
POTENTIAL OFF-SITE ALTERNATIVES

SONOMA CALIFORNIA

5.2 No Project Alternative (B)

The No Project alternative would mean that an asphalt plant would not be constructed.

Analysis Step 1: Ability to Meet Basic and Overall Project Purpose

This alternative would not meet the basic or overall purpose of the project and therefore this alternative was dismissed.

5.3 Sonoma County Landfill (C)

A parcel at the Sonoma County Landfill off of Meacham Road in Petaluma in Sonoma County was considered as an alternative.

Analysis Step 1: Ability to Meet Basic and Overall Project Purpose

This alternative would meet the basic and overall purpose of the project.

Analysis Step 2: Practicability with Respect to Costs, Technology, and Logistics

This alternative was rejected because significant logistical and technological constraints compromised the timely delivery of asphalt to the desired market area. Furthermore, there is no access to deliver materials used to manufacture asphalt by barge, which negatively affects the costs of operating an asphalt plant (see Table 2). Therefore, this alternative was deemed impracticable.

5.4 Port Sonoma (D)

Port Sonoma is located on the east side of the Petaluma River north of the Black Point railroad bridge crossing over the Petaluma River in Sonoma, Sonoma County.

Analysis Step 1: Ability to Meet Basic and Overall Project Purpose

This alternative meets the basic and overall purpose of the project and is therefore considered for further evaluation.

Analysis Step 2: Practicability with Respect to Costs, Technology, and Logistics

This alternative was rejected because significant logistical and technological constraints compromised the timely delivery of asphalt to the desired market area.
In addition, there would be significant cost constraints associated with dredging and annual maintenance dredging of a private channel (refer to Table 2). The dredging constraints and associated environmental permitting pose significant on-going operational costs for this alternative. Dredging, maintenance dredging and associated disposal activities present significant environmental and aquatic impacts and also trigger additional permitting efforts that would cause the project to miss its intended schedule.

Also, there is no natural gas pipeline servicing this area, which proposes a significant technological constraint because natural gas would be used to power the plant.

Because of the logistical and technological constraints associated with this alternative, this alternative was deemed impracticable.

If technological and logistical considerations for Port Sonoma had not deemed this alternative impracticable, other significant adverse environmental consequences associated with this alternative would have. The Port Sonoma alternative would have significant potential adverse environmental consequences, specifically potential impacts on fish and aquatic habitat associated with dredging, disposal of dredged material and potential impacts to federally endangered species including the Ridgway's rail and salt marsh harvest mouse.

5.5 Redwood Landfill (E)

The Redwood landfill in northern Marin County was considered as an alternative site.

Analysis Step 1: Ability to Meet Basic and Overall Project Purpose

This alternative would meet the basic and overall purpose of the project and therefore was considered for further evaluation.

Analysis Step 2: Practicability with Respect to Costs, Technology, and Logistics

This alternative presents logistical constraints associated with dredging. The dredging constraints and associated environmental permitting pose significant additional costs for this alternative (refer to Table 2). In addition, dredging, maintenance dredging and

associated disposal activities present significant environmental and aquatic impacts and also trigger additional permitting efforts that would cause the project to miss its intended schedule. Because of the higher costs associated with the construction of the plant at this location, higher logistical constraints associated with dredging and maintenance dredging and the associated environmental permitting costs, this alternative is not considered practicable and is eliminated from further evaluation.

5.6 Downtown Petaluma (F)

An alternative site located in downtown Petaluma adjacent to the Petaluma River was considered.

Analysis Step 1: Ability to Meet Basic and Overall Project Purpose

This alternative would meet the basic and overall purpose of the project and therefore was considered for further evaluation.

Analysis Step 2: Practicability with Respect to Costs, Technology, and Logistics

This alternative has several complicating logistical factors that are significant. These include high costs associated with private dredging and maintenance dredging of the Petaluma River upstream of the Highway 101 Bridge. Dredging, maintenance dredging and associated disposal activities present significant environmental and aquatic impacts and also trigger additional permitting efforts that would cause the project to miss its intended schedule. In addition to dredging constraints (Table 2), this alternative also has poor highway access (trucks would have to use local urban streets to reach highway 101) and the site is not large enough (over 4.5 acres) to accommodate the size of the plant.

Based on a number of the logistical criteria being impracticable, this alternative was dismissed from further evaluation.

5.7 Pomeroy Site (G)

The former Pomeroy manufacturing site upstream of the Highway 101 crossing of the Petaluma River in Petaluma was considered as an alternative.

Analysis Step 1: Ability to Meet Basic and Overall Project Purpose

This alternative would meet the basic and overall purpose of the project and therefore was considered for further evaluation.

Analysis Step 2: Practicability with Respect to Costs, Technology, and Logistics

This alternative has several complicating logistical factors similar to a downtown Petaluma alternative. These include high costs associated with private dredging and maintenance dredging of the Petaluma River upstream of the Highway 101 Bridge. Dredging, maintenance dredging and associated disposal activities present significant environmental and aquatic impacts and also trigger additional permitting efforts that would cause the project to miss its intended schedule. In addition to dredging constraints, this alternative also has poor highway access (trucks would have to use local urban streets to reach highway 101). For these logistical constraints, this alternative was dismissed from further evaluation.

5.8 Lakeville Highway (H)

An alternative site at Lakeville Highway and Highway 37 in Sonoma, Sonoma County was considered.

Analysis Step 1: Ability to Meet Basic and Overall Project Purpose

This alternative would meet the basic and overall purpose of the project and therefore was considered for further evaluation.

Analysis Step 2: Practicability with Respect to Costs, Technology, and Logistics

This alternative was rejected because of significant logistical and technological constraints compromising the timely delivery of asphalt to the desired market area. In addition, costs associated with dredging to create barge access would be prohibitive and maintenance dredging and associated disposal activities present significant environmental and aquatic impacts and also trigger additional permitting efforts that would cause the project to miss its intended schedule. The site is also restricted due to the lack of a natural gas line to power the plant. Based on a number of the logistical criteria being highly constrained and lack of natural gas, this alternative does not warrant further evaluation.

5.9 Temporary Dutra Site (I)

The former temporary Dutra site just upstream of the Highway 101 Bridge on the Petaluma River was considered as an alternative.

Analysis Step 1: Ability to Meet Overall Project Purpose

This alternative would meet the basic and overall purpose of the project and therefore was considered for further evaluation.

Analysis Step 2: Practicability with Respect to Costs, Technology, and Logistics

This alternative has logistical constraints associated with site size. This site is too small (less than 4.5 acres) to accommodate the asphalt plant and therefore this alternative was dismissed from further evaluation.

DUTRA HAYSTACK ASPHALT PLANT PROJECT ALTERNATIVES ANALYSIS MATRIX TABLE 1

		Practicability											
Alternative	**Meets Overall Project Purpose**	**Technological**		**Logistical**					**Practicable**	**Waters Impacts**	**Dredging Impacts**	**Other Adverse Environmental Impacts**	**LEDPA?**
		1	**2**	**1**	**2**	**3**	**4**	**5**					
A: Originally Proposed Project	YES	YES	YES	YES	YES	YES	NO*	YES	NO*	YES	NO	2, 3	NO
B: Proposed Project	YES	YES	YES	YES	YES	YES	NO*	YES	YES	YES	NO	NA	YES
C: No Project	NO	NA	NA	NA	NA	NA	NA	NA	NO	NA	NA	NA	NO
D: Sonoma County Landfill	YES	YES	NO	YES	NO	YES	NO	YES	NO	NO	NO	NA	NO
E: Port of Sonoma	YES	NO	NO	YES	YES	YES	NO	NO	NO	YES	YES	2, 3	NO
F: Redwood Landfill	YES	NO	YES	YES	YES	YES	NO	NO	NO	YES	YES	3	NO
G: Downtown Petaluma	YES	YES	YES	NO	NO	NO	NO?	NO	NO	YES	YES	1, 2	NO
H: Pomeroy	YES	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	1, 2	NO
I: Lakeville	YES	NO	NO	YES	YES	YES	NO	NO	YES	YES	YES	2, 3	NO
J: Temporary Site	YES	YES	YES	NO	YES	NO	YES	YES	NO	YES	NO?	2, 3	NO

TECHNOLOGICAL CONSTRAINTS

T1 - Access to natural gas

T2 - Proximity to market affects shelf-life of asphalt

LOGISTICAL CONSTRAINTS

L1 - Enough room to accommodate truck turnaround during loading of material

L2 - Efficient highway access

L3 - Site is large enough to accomodate plant

L4 - Ability to construct an off-loading facility for barge access

L5 - Cost to construct an asphalt plant of similar size and production capacity

KEY TO OTHER ADVERSE ENVIRONMENTAL IMPACTS

1 = Air quality impacts associated with truck idling

2 = Fish/aquatic habitat

3 = Endangered species

* Originally proposed project included an off-loading facility was disallowed by the Coast Guared since a docked barge would encroach into the navigable channel.

Dutra Haystack

Alternatives Analysis - Cost Analysis Table 2

Alternative	Description	Water Access	NOAA Depth Chart (@MLLW)	Dredge Depth (@MLLW)	Additional Dredge Depth (ft)	Dredge Channel Width Existing Grade(ft)*	Dredge Channel Length (ft) **	Cut Slope (H:V)	Dredge Channel Width (Bottom of Channel)	Cross Section (SF)	Dredge Volume (CY)	2002 AVG Cost ($/CY)	Mobilization	Estimated Cost of Construction	Additional Permitting Cost	Total Dredge Cost	E-Crane	Install 300' Sheet Pile Bulk Head	Additional Gas Line LF	Additional Gas Line Cost	Total Additional Construction Cost	% Increase in Construction Cost	Logistical?
A	Originally Proposed Project	Yes	8	8	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	$ 1,500,000	$ 375,000.00	0	0	$ 1,875,000	#REF!	Yes
B	Proposed Project	Yes	8	8	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	#REF!	Yes
C	No Project	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D	Sonoma County Landfill	No	N/A	N/A	N/A											$ -	$ -	$ -	7420	$ 1,855,000	$1,855,000	#REF!	Yes
E	Port of Sonoma	Yes	4	8	4	256	1500	3:1	232	976	54,222	$ 12.00	$ 200,000	$ 850,667	$1,000,000	$1,850,667	$ 1,500,000	$ 375,000	20620	$ 5,155,000	$8,880,667	111%	No
F	Redwood Landfill	Yes	5	8	3	256	6000	3:1	238	741	164,667	$ 12.00	$ 200,000	$ 2,176,000	$1,000,000	$3,176,000	$ 1,500,000	$ 375,000	1500	$ 375,000	$5,426,000	68%	No
G	Downtown Petaluma	Yes	5	8	3	256	6750	3:1	238	741	185,250	$ 12.00	$ 200,000	$ 2,423,000	$1,000,000	$3,423,000	$ 1,500,000	$ 375,000	0	$ -	$5,298,000	66%	No
H	Pomeroy Site	Yes	6	8	2	256	3700	3:1	244	500	68,519	$ 12.00	$ 200,000	$ 1,022,222	$1,000,000	$2,022,222	$ 1,500,000	$ 375,000	0	$ -	$3,897,222	49%	Yes
I	Lakeville Hwy 37	Yes	0	8	8	256	17500	3:1	208	1856	1,202,963	$ 12.00	$ 200,000	$ 14,635,556	$1,000,000	$15,635,556	$ 1,500,000	$ 375,000	31180	$ 7,795,000	$25,305,556	316%	No
J	Temporary Site	Yes	8	8	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	$ 1,500,000	$ 375,000	0	$ -	$1,875,000	23%	Yes

*Assumes dredged channel width similar to that of Proposed Project

**Channel Lengths for G, H & I based on starting @ Haystack RR Bridge, E starting @ entrance to Port, I starting in San Pablo Bay, F starting at Petaluma River

Proposed Project Cost Estimate

$ 8,000,000.00

Criteria for Constraint

It is assumed that a reasonable additional cost to construct a similar asphalt plant would be limited to a cost increase of 50% of the proposed project cost. A cost increase above 50% would render the project impracticable as the owner would not be able to finance the project and obtain a return on investment that would warrant the risk associated with construction and operation of an asphalt facility.

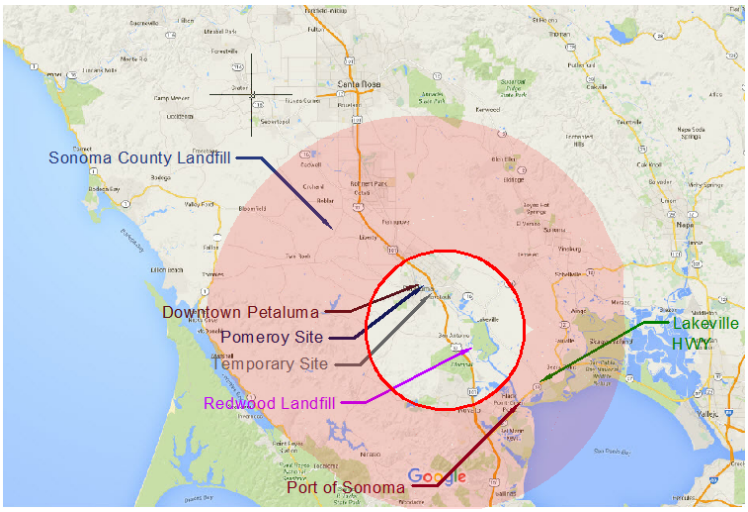
Market Area and Technological Constraints related to Asphalt Temperature

The basic project purpose is to serve Southern Sonoma and Northern Marin County asphalt and aggregate markets. Close proximity to the 101 corridor is required as this allows for efficient distribution of materials to customers sites and Highway 101 which uses a large amount of materials for highway maintenance and construction provided by the Dutra asphalt and aggregate operation.

Access to the desired market area is limited to areas that are close enough to the plant to allow the delivered material to be at a high enough temperature to meet the specifications required to place the asphalt. A number of factors affect the temperature at which asphalt arrives to a project site including, haul distance, truck speed, traffic delays, ambient temperature, wind speed, quantity of asphalt and general weather. If asphalt is allowed to cool below a certain point, it loses its ability to be properly spread and compacted within State and local specification requirements and is no longer a useful product.

The market area map below shows Haystack plant's market area in red. The inner circle represents the area in which an alternate plant could be located and maintain reasonable access to the desired market area based on the technological constraint of maintaining appropriate asphalt temperature. Although the Sonoma County Landfill, Port of Sonoma and Lakeville Highway fall within the Haystack market area, they are located outside of inner ring and therefore would not be capable of serving the extents of the desired market area.

The map below contains portions of what could also be considered the market area of San Rafael Rock Quarry. The San Rafael Rock Quarry has specific use permit conditions limiting the number of trucks out of the quarry, hours of operation and days of operation. An overlap of market area is appropriate to cover night and weekend work which is not permitted to occur at the San Rafael Rock Quarry. Major paving projects throughout the greater Bay Area occur at night or on weekends to limit traffic impacts. As such, the Dutra Haystack Asphalt Plant will be a vital resource to meet the infrastructure needs of the defined market area.



6.0 Summary of Analysis of Alternatives and Identification of the Least Environmentally Damaging Alternative (LEDPA)

6.1 Analysis of Alternatives

The analysis of the Originally Proposed Project, a No Project alternative and eight off-site alternatives was provided in Sections 5.0. Based on this analysis, it was determined that No Project alternative would not meet the basic and overall purpose of the project and therefore this alternative was rejected. The Originally Proposed Project was rejected on logistical constraints associated with not being able to construct a dock and pier for off-loading in the Petaluma River because it would interfere with the navigable channel as determined by the U.S. Coast Guard; not being able to barge materials poses a significant cost constraint which would render the alternative impracticable to the applicant.

Based on the analysis of off-site alternatives, Alternative D (Sonoma County Landfill) was rejected because of significant logistical and technological constraints compromising the timely delivery of asphalt to the desired market area.

Alternative E (Port Sonoma) was also rejected as an alternative because of significant logistical and technological constraints compromising the timely delivery of asphalt to the desired market area. This site also has logistical constraints associated with dredging and ongoing maintenance dredging, which renders the project costs and environmental impacts impracticable. Other adverse environmental impacts including truck traffic and impacts to endangered species and aquatic life render this alternative more environmentally damaging than the proposed project and therefore it is not the LEDPA.

Alternative F (Redwood Landfill) would result in higher costs associated with the construction of the asphalt plant, higher logistical constraints associated with dredging and maintenance dredging and associated environmental permitting costs. Dredging, maintenance dredging and associated disposal activities present significant environmental and aquatic impacts and also trigger additional permitting efforts that would cause the project to miss its intended schedule. Dredging constraints made this alternative impracticable and therefore it was determined to not be the LEDPA.

Alternative G (Downtown Petaluma) has several complicating logistical factors that are significant. These include high costs associated with private dredging and maintenance dredging of the Petaluma River upstream of the Highway 101 Bridge. Dredging, maintenance dredging and associated disposal activities present significant environmental and aquatic impacts and also trigger additional permitting efforts that

would cause the project to miss its intended schedule. In addition to dredging constraints, this alternative also has poor highway access (trucks would have to use local urban streets to reach Highway 101). In addition, there is no property large enough (up to 4.5 acres) to accommodate the size of the plant. Therefore, this alternative was determined impracticable.

Alternative H (Pomeroy Site) has similar constraints to Alternative D, most notably high costs associated with dredging and poor highway access, which translates to higher costs. Dredging, maintenance dredging and associated disposal activities present significant environmental and aquatic impacts and also trigger additional permitting efforts that would cause the project to miss its intended schedule. This alternative was therefore determined impracticable.

Alternative I (Lakeville) was rejected because of significant logistical and technological constraints compromising the timely delivery of asphalt to the desired market area. In addition, costs associated with dredging to create barge access would be prohibitive and maintenance dredging and associated disposal activities present significant environmental and aquatic impacts and also trigger additional permitting efforts that would cause the project to miss its intended schedule. The site is also restricted due to the lack of a natural gas line to power the plant. Because of these significant constraints and the high costs for construction, this alternative was deemed impracticable.

Alternative J (Temporary Site) was dismissed early in the analysis process due to the logistical constraint of site size. The site is not large enough to accommodate a facility that would cover approximately 4.5 acres.

6.2 Identification of the LEDPA

Based on this analysis, the Proposed Project was determined to be the LEDPA. This determination is based on the facts that costs for constructing the plant are practicable at the proposed location and the alternative meets the basic and overall purpose of the project. With the ability to use the Shamrock Landing Way Facility for off-loading barged materials, the cost for construction and operation of the asphalt plant is practicable for the applicant. In addition, this alternative will minimize impacts to waters of the United States and has the least environmental damaging consequences compared to the other alternatives.