

U.S. Fish & Wildlife Service

IPaC Trust Resources Report



LOCATION

Contra Costa County, California

IPAC LINK

<https://ecos.fws.gov/ipac/project/7RQNW-2HOFZ-HMRLV-75YQM-PWNBFY>



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

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Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the [Endangered Species Program](#) of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

[Section 7](#) of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Amphibians

California Red-legged Frog *Rana draytonii* Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=D02D

California Tiger Salamander *Ambystoma californiense* Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=D01T

Birds

California Clapper Rail *Rallus longirostris obsoletus* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B04A

Crustaceans

Vernal Pool Fairy Shrimp *Branchinecta lynchi* Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=K03G

Vernal Pool Tadpole Shrimp *Lepidurus packardii* Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=K048

Fishes

Delta Smelt *Hypomesus transpacificus* Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=E070

Flowering Plants

Antioch Dunes Evening-primrose *Oenothera deltoides* ssp. *howellii* Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=Q1ZN

Large-flowered Fiddleneck *Amsinckia grandiflora* Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=Q1SU

Soft Bird's-beak *Cordylanthus mollis* ssp. *mollis* Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=Q0GT

Insects

Delta Green Ground Beetle *Elaphrus viridis* Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=I01G

San Bruno Elfin Butterfly *Callophrys mossii bayensis* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=I00Q

Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=I01L

Reptiles

Giant Garter Snake *Thamnophis gigas* Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C057

Critical Habitats

This location overlaps all or part of the critical habitat for the following species:

Delta Smelt Critical Habitat Final designated

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E070#crithab

Migratory Birds

Birds are protected by the [Migratory Bird Treaty Act](#) and the [Bald and Golden Eagle Protection Act](#).

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.^[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
<http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Conservation measures for birds
<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Year-round bird occurrence data
<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php>

The following species of migratory birds could potentially be affected by activities in this location:

Bald Eagle *Haliaeetus leucocephalus*

Year-round

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B008

Bird of conservation concern

Black Rail *Laterallus jamaicensis*

Season: Breeding

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B09A

Bird of conservation concern

Burrowing Owl *Athene cunicularia*

Year-round

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0NC

Bird of conservation concern

Fox Sparrow *Passerella iliaca*

Season: Wintering

Bird of conservation concern

Least Bittern <i>Ixobrychus exilis</i> Season: Breeding	Bird of conservation concern
Lesser Yellowlegs <i>Tringa flavipes</i> Season: Wintering https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0MD	Bird of conservation concern
Lewis's Woodpecker <i>Melanerpes lewis</i> Season: Wintering https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HQ	Bird of conservation concern
Loggerhead Shrike <i>Lanius ludovicianus</i> Year-round https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0FY	Bird of conservation concern
Long-billed Curlew <i>Numenius americanus</i> Season: Wintering https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B06S	Bird of conservation concern
Marbled Godwit <i>Limosa fedoa</i> Season: Wintering https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0JL	Bird of conservation concern
Mountain Plover <i>Charadrius montanus</i> Season: Wintering https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B078	Bird of conservation concern
Nuttall's Woodpecker <i>Picoides nuttallii</i> Year-round https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HT	Bird of conservation concern
Oak Titmouse <i>Baeolophus inornatus</i> Year-round https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0MJ	Bird of conservation concern
Peregrine Falcon <i>Falco peregrinus</i> Year-round https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0FU	Bird of conservation concern
Short-billed Dowitcher <i>Limnodromus griseus</i> Season: Wintering https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0JK	Bird of conservation concern
Short-eared Owl <i>Asio flammeus</i> Season: Wintering https://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HD	Bird of conservation concern
Snowy Plover <i>Charadrius alexandrinus</i> Season: Breeding	Bird of conservation concern

Song Sparrow <i>Melospiza melodia maxillaris</i> Year-round https://ecos.fws.gov/tess_public/profile/speciesProfile.action?scode=B08R	Bird of conservation concern
Swainson's Hawk <i>Buteo swainsoni</i> Season: Breeding https://ecos.fws.gov/tess_public/profile/speciesProfile.action?scode=B070	Bird of conservation concern
Tricolored Blackbird <i>Agelaius tricolor</i> Year-round https://ecos.fws.gov/tess_public/profile/speciesProfile.action?scode=B06P	Bird of conservation concern
Western Grebe <i>aechmophorus occidentalis</i> Year-round https://ecos.fws.gov/tess_public/profile/speciesProfile.action?scode=B0EA	Bird of conservation concern
Yellow Rail <i>Coturnicops noveboracensis</i> Season: Wintering https://ecos.fws.gov/tess_public/profile/speciesProfile.action?scode=B0JG	Bird of conservation concern
Yellow-billed Magpie <i>Pica nuttalli</i> Year-round https://ecos.fws.gov/tess_public/profile/speciesProfile.action?scode=B0N8	Bird of conservation concern

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

Freshwater Emergent Wetland

PEMCh	7.88 acres
PEMFh	2.43 acres

Freshwater Forested/shrub Wetland

PSSCh	46.0 acres
PSS/EMCh	15.9 acres

<u>PSSC</u>	5.51 acres
Freshwater Pond	
<u>PUBH</u>	0.451 acre
Lake	
<u>L1UBH</u>	3490.0 acres
<u>L1UBV</u>	433.0 acres
Other	
<u>Pf</u>	2840.0 acres
Riverine	
<u>R1UBV</u>	30200.0 acres

A full description for each wetland code can be found at the National Wetlands Inventory website: <http://107.20.228.18/decoders/wetlands.aspx>

Scientific Name	Common Name	Federal Status	State Status	CNPS Rare Plant Status	Habitat	Habitat Present/Absent	Impact Potential
Plants							
<i>Amsinckia grandiflora</i>	large-flowered fiddleneck	FE	SE	1B.1	Cismontane woodland, and valley and foothill grassland. Elev: 902-1,804 ft (275-550 m). Blooms: Apr-May (CNPS 2015).	A	No effect. Suitable habitat not present. Project sites are below species elevation range.
<i>Arctostaphylos auriculata</i>	Mt. Diablo manzanita	-	-	1B.3	Cismontane woodland and sandstone soils in chaparral. Elev: 443-2,132 ft (135-650 m) Blooms: Jan-Mar (CNPS 2015).	A	No effect. Suitable habitat not present. Project sites are below species elevation range.
<i>Arctostaphylos manzanita</i> ssp. <i>laevigata</i>	Contra Costa manzanita	-	-	1B.2	Rocky chaparral. Elev: 1,640-3,680 ft (500-1,100 m) Blooms: Jan-Apr (CNPS 2015).	A	No effect. Suitable habitat not present. Project sites are below species elevation range.
<i>Astragalus tener</i> var. <i>tener</i>	alkali milk-vetch	-	-	1B.2	Alkaline soils in playas, valley & foothill grassland (adobe clay), and vernal pools. Elev: 3-197 ft (1-60 m) Blooms: Mar-June (CNPS 2015).	A	No effect. Suitable soils not present (USDA 2015).
<i>Atriplex cordulata</i> var. <i>cordulata</i>	heartscale	-	-	1B.2	Saline or alkaline areas in chenopod scrub, meadows, seeps, and valley and foothill grassland. Elev: 0-1,837 ft (0-560 m) Blooms: Apr-Oct (CNPS 2015).	A	No effect. Suitable soils not present (USDA 2015).
<i>Atriplex depressa</i>	brittlescale	-	-	1B.2	Alkaline and clay areas in chenopod scrub, meadows, seeps, playas, vernal pools, and valley and foothill grasslands. Elev: 3-1,049 ft (1-320 m) Blooms: Apr-Oct (CNPS 2015).	A	No effect. Suitable soils not present (USDA 2015).
<i>Blepharizonia plumosa</i>	big tarplant	-	-	1B.1	Usually clay in valley and foothill grasslands. Elev: 98-1,656 ft (30-505 m) Blooms: July-Oct (CNPS 2015).	A	No effect. Project sites are below species elevation range.
<i>Brasenia schreberi</i>	watershield	-	-	2B.3	Freshwater marshes and swamps. Elev: 98-7,218 ft (30-2,200 m) Blooms: June-Sept (CNPS 2015).	A	No effect. Project sites are below species elevation range.
<i>California macrophylla</i>	round-leaved filaree	-	-	1B.1	Clay soils in cismontane woodland and valley and foothill grasslands. Elev: 49-3,937 ft (15-1,200 m) Blooms: Mar-May (CNPS 2015).	A	No effect. Project sites are below species elevation range.
<i>Calochortus pulchellus</i>	Mt. Diablo fairy-lantern	-	-	1B.2	Chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland. Elev: 98-2,756 ft (30-840 m) Blooms: Apr-June (CNPS 2015).	A	No effect. Project sites are below species elevation range.
<i>Carex comosa</i>	bristly sedge	-	-	2B.1	Coastal prairies, valley and foothill grasslands, as well as marshes, swamps and lake margins. Elev: 0-2,051 ft (0-625 m) Blooms: May-Sept (CNPS 2014).	P	May affect. Wetlands, pond edges and slough edges provide suitable habitat for this species.
<i>Centromadia parryi</i> ssp. <i>congdonii</i>	Congdon's tarplant	-	-	1B.1	Alkaline valley and foothill grasslands. Elev: 0-755 ft (0-230 m) Blooms: May-Nov (CNPS 2015).	A	No effect. Suitable habitat not present.

<i>Centromadia parryi</i> ssp. <i>parryi</i>	pappose tarplant	-	-	1B.2	Often in alkaline areas in chaparral, coastal prairie, meadows and seeps, coastal salt marshes and swamps, and vernal mesic valley and foothill grasslands. Elev: 0-1,378 ft (0-420 m) Blooms: May-Nov (CNPS 2015).	P	No effect. Alkaline areas not present. Nearest known occurrence is over 12 miles northwest of the project sites (CDFW 2015c).
<i>Chloropyron molle</i> ssp. <i>molle</i>	soft bird's-beak	FE	SR	1B.2	Coastal salt marshes and swamps. Elev: 0-10 ft (0-3 m) Blooms: July-Nov (CNPS 2015).	A	No effect. Suitable habitat not present.
<i>Cicuta maculata</i> var. <i>bolanderi</i>	Bolander's water-hemlock	-	-	2B.1	Coastal, fresh or brackish marshes and swamps. Elev: 0-656 ft (0-200 m) Blooms: July-Sept (CNPS 2015).	P	May affect. Wetlands and slough edges provide suitable habitat for this species.
<i>Cryptantha hooveri</i>	Hoover's cryptantha	-	-	1A	Inland dunes and sandy valley and foothill grasslands. Elev: 30-493 ft (9-150 m) Blooms: Apr-May (CNPS 2015).	A	No effect. Species presumed extinct (CNPS 2015). Suitable habitat not present and project sites are below species elevation range.
<i>Downingia pusilla</i>	dwarf downingia	-	-	2B.2	Vernal pools and mesic valley and foothill grasslands. Elev: 3-1,459 ft (1-445 m) Blooms: Mar-May (CNPS 2015).	A	No effect. Suitable habitat not present.
<i>Eriogonum nudum</i> var. <i>psychicola</i>	Antioch Dunes buckwheat	-	-	1B.1	Inland dunes. Elev: 0-66 ft (0-20 m) Blooms: July-Oct (CNPS 2015).	A	No effect. Suitable habitat not present.
<i>Eriogonum truncatum</i>	Mt. Diablo buckwheat	-	-	1B.1	Sandy areas in chaparral, coastal scrub, and valley and foothill grasslands. Elev: 10-1,148 ft (3-350 m) Blooms: Apr-Dec (CNPS 2015).	A	No effect. Suitable habitat not present and project sites are below species elevation range.
<i>Eryngium racemosum</i>	Delta button-celery	-	SE	1B.1	Vernally mesic clay depressions in riparian scrub. Elev: 10-98 ft (3-30 m) Blooms: June-Oct (CNPS 2015).	A	No effect. Suitable habitat and soils not present (USDA 2015). Project sites are below species elevation range.
<i>Erysimum capitatum</i> var. <i>angustatum</i>	Contra Costa wallflower Critical Habitat, Contra Costa wallflower	FE X	-	-	Inland dunes. Elev: 10-66 ft (3-20 m) Blooms: Mar-July (CNPS 2015).	A A	No effect. Suitable habitat not present. No effect. Project site not located within Critical Habitat Unit.
<i>Eschscholzia rhombipetala</i>	diamond-petaled California poppy	-	-	1B.1	Alkaline and clay valley and foothill grasslands. Elev: 0-3,199 ft (0-975 m) Blooms: Mar-Apr (CNPS 2015).	A	No effect. Suitable soils not present. Project sites are characterized by muck, silt loam, sandy loam, and loamy sand soils (USDA 2015).
<i>Extriplex joaquinana</i>	San Joaquin spearscale	-	-	1B.2	Alkaline chenopod scrub, meadows, seeps, playas, and valley and foothill grasslands. Elev: 3-2,739 ft (1-835 m) Blooms: Apr-Oct (CNPS 2015).	A	No effect. Suitable soils not present (USDA 2015).
<i>Fritillaria liliaceae</i>	fragrant fritillary	-	-	1B.2	Serpentinite soils in cismontane woodland, coastal prairie, coastal scrub, valley & foothill grassland. Elev: 10-1,345 ft (3-410 m) Blooms: Feb-Apr (CNPS 2015).	A	No effect. Suitable habitat not present and project sites are below species elevation range.
<i>Helianthella castanea</i>	Diablo helianthella	-	-	1B.2	Chaparral, cismontane woodland, coastal scrub, riparian woodland, broadleaved upland forest, and valley and foothill grasslands. Elev: 197-4,265 ft (60-1,300 m) Blooms: Mar-June (CNPS 2015).	A	No effect. Suitable habitat not present and project sites are below species elevation range.
<i>Hesperolinon breweri</i>	Brewer's western flax	-	-	1B.2	Usually serpentinite, in chaparral, cismontane woodland, and valley and foothill grasslands. Elev: 98-2,953 ft (30-900 m) Blooms: May-July (CNPS 2015).	A	No effect. Suitable habitat not present and project sites are below species elevation range.

<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	woolly rose-mallow	-	-	1B.2	Freshwater marshes and swamps. Elev: 0-394 ft (0-120 m) Blooms: June-Sept (CNPS 2015).	P	May affect. Slough edges provide suitable habitat for this species. One record of this species adjacent to the Horseshoe Bend Levee on the east side of Piper Slough (Occurrence #106; CDFW 2015c).
<i>Isocoma arguta</i>	Carquinez goldenbush	-	-	1B.1	Alkaline valley and foothill grassland. Elev: 3-66 ft (1-20 m) Blooms: Aug-Dec (CNPS 2015).	A	No effect. Suitable habitat not present.
<i>Juglans hindsii</i>	Northern California black walnut	-	-	1B.1	Riparian forest/woodland. Elev: 0-1,444 ft (0-440 m) Blooms: Apr-May (CNPS 2015).	A	No effect. Suitable habitat not present.
<i>Lasthenia conjugens</i>	Contra Costa goldfields	FE	-	1B.1	Mesic areas in vernal pools, cismontane woodland, alkaline playas, and valley and foothill grasslands. Elev: 0-1,542 ft (0-470 m) Blooms: Mar-June (CNPS 2015).	A	No effect. Suitable habitat not present.
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	-	-	1B.2	Freshwater and brackish marshes and swamps. Elev: 0-13 ft (0-4 m) Blooms: May-Sept (CNPS 2015).	P	May affect. Slough edges provide suitable habitat for this species. Several occurrences of this species along multiple sloughs within a mile of the project sites (CDFW 2015c).
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	-	SR	1B.1	Riparian scrub, and brackish or freshwater marshes and swamps. Elev: 3-33 ft (0-10 m) Blooms: Apr-Nov (CNPS 2015).	P	May affect. Slough edges provide suitable habitat for this species. One record of this species adjacent to the Horseshoe Bend Levee along Piper Slough (CDFW 2015c).
<i>Limosella australis</i>	Delta mudwort	-	-	2B.1	Usually mud banks in riparian scrub, and freshwater or brackish marshes and swamps. Elev: 0-10 ft (0-3 m) Blooms: May-Aug (CNPS 2015).	P	May affect. Slough edges provide suitable habitat for this species. Several occurrences of this species within a mile of the project sites, including one record along Piper Slough (CDFW 2015c).
<i>Madia radiata</i>	showy golden madia	-	-	1B.1	Cismontane woodland, and valley and foothill grasslands. Elev: 82-3,986 ft (25-1,215 m) Blooms: Mar-May (CNPS 2015).	A	No effect. Project sites are below species elevation range.
<i>Malacothammus hallii</i>	Hall's bush-mallow	-	-	1B.2	Chaparral and coastal scrub. Elev: 33-2,493 ft (10-760 m) Blooms: May-Oct (CNPS 2015).	A	No effect. Suitable habitat not present and project sites are below species elevation range.
<i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	Baker's navarretia	-	-	1B.1	Mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools. Elev: 16-5,709 ft (5-1,740 m) Blooms: Apr-July (CNPS 2015).	A	No effect. Project sites are below species elevation range.
<i>Navarretia nigelliformis</i> ssp. <i>radians</i>	shining navarretia	-	-	1B.2	Sometimes clay in cismontane woodland, vernal pools, and valley and foothill grassland. Elev: 249-3,281 ft (76-1,000 m) Blooms: Apr-July (CNPS 2015).	A	No effect. Project sites are below species elevation range.
<i>Neostapfia colusana</i>	Colusa grass	FT			Large, adobe vernal pools. Elev: 16-656 ft (5-200 m) Blooms: May-Aug (CNPS 2015).	A	No effect. Suitable habitat not present.
<i>Oenothera deltoides</i> ssp. <i>howellii</i>	Antioch Dunes evening primrose	FE	SE	1B.1	Inland dunes. Elev: 0-98 ft (0-30 m) Blooms: Mar-Sept (CNPS 2015).	A	No effect. Suitable habitat not present.
	Critical Habitat, Antioch Dunes evening primrose	X	-	-		A	No effect. Project site not located within Critical Habitat Unit.

<i>Plagiobothrys hystericulus</i>	bearded popcorn-flower	-	-	1B.1	Often in vernal swales in vernal pool margins and mesic valley and foothill grasslands. Elev: 0-899 ft (0-274 m) Blooms: Apr-May (CNPS 2015).	A	No effect. Suitable habitat not present.
<i>Potamogeton zosteriformis</i>	eel-grass pondweed	-	-	2B.2	Assorted freshwater marshes and swamps. Elev: 0-6,102 ft (0-1,860 m) Blooms: June-July (CNPS 2015).	P	May affect. Sloughs provide suitable habitat. This species has been recorded just north of Horseshoe Bend in Weber Tract (CDFW 2015c).
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	-	-	1B.2	Assorted shallow freshwater marshes and swamps. Elev: 0-2,133 ft (0-650 m) Blooms: May-Oct (CNPS 2015).	P	May affect. Slough edges provide suitable habitat. Nearest known occurrence is near Rio Vista (CDFW 2015c).
<i>Scutellaria galericulata</i>	marsh skullcap	-	-	2B.2	Marshes, swamps, mesic meadows and seeps. Elev: 0-1,640 ft (0-500 m) Blooms: July-Sept (CNPS 2015).	P	May affect. Slough edges provide suitable habitat. Nearest known occurrence associated with Sheep Slough (CDFW 2015c).
<i>Scutellaria laterifolia</i>	side-flowering skullcap	-	-	2B.2	Brackish and freshwater marshes and swamps. Elev: 0-10 ft (0-3 m) Blooms: May-Nov (CNPS 2015).	P	May affect. Slough edges provide suitable habitat. Nearest known occurrence associated with Bouldin Island (CDFW 2015c).
<i>Senecio aphanactis</i>	chaparral ragwort	-	-	2B.2	Sometimes alkaline in chaparral, cismontane woodland, and coastal scrub. Elev: 49-2,625 ft (15-800 m) Blooms: Jan-Apr (CNPS 2015).	A	No effect. Suitable habitat not present and project sites are below species elevation range.
<i>Sidalcea keckii</i>	Keck's checkerbloom	FE	-	1B.1	Serpentine and clay soils in cismontane woodland and valley and foothill grasslands. Elev: 246-2,133 ft (75-650 m) Blooms: Apr-June (CNPS 2015).	A	No effect. Suitable habitat not present.
<i>Symphyotrichum lentum</i>	Suisun Marsh aster	-	-	1B.2	Brackish and freshwater marshes and swamps. Elev: 0-10 ft (0-3 m) Blooms: May-Nov (CNPS 2015).	P	May affect. Slough edges provide suitable habitat for this species. Numerous occurrences of this species within a mile of the project sites, including several records along Piper Slough adjacent to Horseshoe Bend (CDFW 2015c).
<i>Tropidocarpum capparideum</i>	caper-fruited tropidocarpum	-	-	1B.1	Alkaline hills in valley and foothill grassland. Elev: 3-1,493 ft (1-455 m) Blooms: Mar-Apr (CNPS 2015).	A	No effect. Suitable habitat not present.
<i>Viburnum ellipticum</i>	oval-leaved viburnum	-	-	2B.3	Chaparral, cismontane woodland, and lower montane coniferous forest. Elev: 705-4,593 ft (215-1,400 m) Blooms: May-June (CNPS 2015).	A	No effect. Suitable habitat not present and project sites are below species elevation range.
Invertebrates							
<i>Apodemia mormo langei</i>	Lange's metalmark butterfly	FE	-		Endemic to the Antioch Dunes (USFWS 2008)	A	No effect. Action area outside species range.
<i>Branchinecta conservatio</i>	conservancy fairy shrimp	FE	-		Vernal pools, often large and turbid pools (USFWS 2005).	A	No effect. Suitable habitat not present.
<i>Branchinecta longiantenna</i>	longhorn fairy shrimp	FE	-		Various types of vernal pools (USFWS 2005).	A	No effect. Suitable habitat not present.
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT	-			A	No effect. Suitable habitat not present.
	Critical Habitat, vernal pool fairy shrimp	X	-		Found in vernal pools and ephemeral wetlands. Distributed throughout the Central Valley, including Sacramento County (USFWS 2005).	A	No effect. Action area not located within Critical Habitat Unit.

<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	FT	-		Dependent on hostplant, elderberry (<i>Sambucus</i> spp.), which generally grows in riparian woodlands and upland habitats of the Central Valley. Current distribution in the Central Valley from Shasta County to Fresno County (USFWS 1999).	A	No effect. Host plant not observed during reconnaissance-level surveys.
<i>Elaphrus viridis</i>	delta green ground beetle	FT	-		Grassland interspersed with vernal pools. Only documented in the greater Jepson Prairie in south-central Solano County (USFWS 2005).	A	No effect. Action area outside species range.
<i>Incisalia mossii bayensis</i>	San Bruno elfin butterfly	FE	-		Typical habitat is coastal grassland and low scrub of north-facing slopes within the fog belt where the larval host plant grows, stonecrop (<i>Sedum spathulifolium</i>). All known locations are restricted to San Mateo County (USFWS 2010a).	A	No effect. Outside known species range.
<i>Lepidurus packardii</i>	vernal pool tadpole shrimp	FE	-		Wide variety of ephemeral wetland habitats, including vernal pools. Distributed throughout Central Valley and San Francisco Bay area (USFWS 2005).	A	No effect. Suitable habitat not present.
Fish							
<i>Acispenser medirostris</i>	green sturgeon	FT	SSC		Entire coast of California. Spawning occurs in Sacramento River and Klamath River (USFWS 1996). Oceanic waters, bays, and estuaries during non-spawning season. Spawning habitat = deep pools in large, turbulent, freshwater mainstems (NMFS 2005).	P	May affect. Sloughs provide suitable habitat for this species.
<i>Archoplites interruptus</i>	Sacramento perch	-	SSC		Historically, Central Valley sloughs, slow-moving rivers, and lakes with beds of rooted emergent aquatic vegetation. Current distribution is artificially stocked farm ponds and reservoirs (USFWS 1996).	A	No effect. Species distribution currently restricted to farm ponds and reservoirs.
<i>Hypomesus transpacificus</i>	delta smelt	FT	SE		Distribution includes the Sacramento River below Isleton, San Joaquin River below Mossdale, and Suisun Bay. Spawning areas include the Sacramento River below Sacramento, Mokelumne River system, Cache Slough, the delta, and Montezuma Slough (USFWS 1996).	P	May affect. Sloughs provide suitable habitat for this species.
	Critical Habitat, delta smelt	X	-			P	May affect. Sloughs associated with Critical Habitat unit.
<i>Lampetra ayresii</i>	river lamprey	-	SSC		Adults require clean, gravelly riffles in permanent streams for spawning, while the ammocoetes require sandy backwaters or stream edges in which to bury themselves, where water quality is continuously high and temperatures do not exceed 25°C (Moyle et al. 1995).	P	May affect. Sloughs provide suitable habitat for this species.

<i>Mylopharodon conocephalus</i>	hardhead	-	SSC		Small to large streams in a low to mid-elevation environment. May also inhabit lakes or reservoirs. Their preferred stream temperature might easily exceed 20°C, though these fish do not favor low dissolved oxygen levels. Therefore the hardhead minnow is usually found in clear deep streams with a slow but present flow. Though spawning may occur in pools, runs, or riffles, the bedding area will typically be characterized by gravel and rocky substrate (UC Davis 2015).	A	No effect. Suitable habitat not present. Outside species range (Moyle et al. 1995).
<i>Oncorhynchus kisutch</i>	coho salmon - Central California coast	FE	SE		Spawning habitat = small streams, stable gravel substrates. Non-spawning = estuarine, marine waters (Weitkamp et al. 1995).	A	No effect. Species no longer found in the bay delta (UC Davis 2015).
<i>Oncorhynchus mykiss</i>	Central Valley steelhead	FT	-		Spawning habitat = gravel-bottomed, fast-flowing, well-oxygenated rivers and streams. Non-spawning = estuarine, marine waters (Busby et al 1996).	P	May affect. Sloughs provide suitable habitat for this species.
	Central California coast steelhead	FT	-			P	May affect. Sloughs provide suitable habitat for this species.
	Critical Habitat, Central Valley steelhead	X	-			A	No effect. Sloughs next to project sites are not associated with Critical Habitat unit; however, there is critical habitat in the vicinity (False River, Dutch Slough, Franks Tract).
<i>Oncorhynchus tshawytscha</i>	spring-run Klamath-Trinity Rivers chinook salmon	-	SSC		Spawning habitat = fast moving, freshwater streams and rivers. Juvenile habitat = brackish estuaries. Non-spawning = marine waters (Myers et al 1998).	A	No effect. Outside species range.
	Central Valley spring-run chinook salmon	FT	ST			P	May affect. Sloughs provide suitable habitat for this species.
	Critical Habitat, Central Valley spring-run chinook salmon	X	-			A	No effect. Project sites not located within Critical Habitat Unit.
	winter-run chinook salmon, Sacramento River	FE	SE			P	May affect. Sloughs provide suitable habitat for this species.
	Critical Habitat, winter-run chinook salmon	X	-			A	No effect. Project sites not located within Critical Habitat Unit.
	Central Valley fall/late fall-run chinook salmon	-	SSC			P	May affect. Sloughs provide suitable habitat for this species.
<i>Pogonichthys macrolepidotus</i>	Sacramento splittail	-	SSC		Prefer slow-moving sections of freshwater rivers and sloughs. Most abundant in Suisun Bay and Marsh region. Largely absent from Sacramento River except during spawning (USFWS 1996).	P	May affect. Sloughs provide suitable habitat for this species.
<i>Spirinchus thaleichthys</i>	longfin smelt	FC	ST/SSC		Found close to shore, in bays and estuaries and ascend coastal streams to spawn (CDFW 2009).	P	May affect. Sloughs provide suitable habitat for this species.
Amphibians							

<i>Ambystoma californiense</i>	California tiger salamander, central population	FT	ST/SSC		Occurs in grasslands of the Central Valley and oak savannah communities in the Central Valley, the Sierra Nevada and Coast ranges, and the San Francisco Bay Area. Needs seasonal or semi-permanent wetlands to reproduce, and terrestrial habitat with active ground squirrel or gopher burrows (Bolster 2010).	A	No effect. Species not known to occur on delta islands. Project does not align with species range (California Wildlife Habitat Relations California tiger salamander species range map 2005 update; CDFW 2015b).
	Critical Habitat, CA tiger salamander, central population	X	-			A	No effect. Project site not located within Critical Habitat Unit.
<i>Rana draytonii</i>	California red-legged frog	FT	SSC		Found mainly near ponds in humid forests, woodlands, grasslands, coastal scrub, and streambanks with plant cover. Most common in lowlands or foothills. Frequently found in woods adjacent to streams. Breeding habitat is in permanent or ephemeral water sources; lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. Ephemeral wetland habitats require animal burrows or other moist refuges for estivation when the wetlands are dry. From sea level to 5,000 ft. (1,525 m.) (Nafis 2015).	A	No effect. Outside species range. Project does not align with species range (California Wildlife Habitat Relations California red-legged frog species range map 2008 update; CDFW 2015d).
Reptiles							
<i>Anniella pulchra pulchra</i>	silvery legless lizard	-	SSC		Occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodland, desert scrub, sandy washes, and stream terraces (Nafis 2015).	A	No effect. Suitable habitat not present.
<i>Emys marmorata</i>	western pond turtle	-	SSC		Found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, and either rocky or muddy bottoms, in woodland, forest, and grassland. In streams, prefers pools to shallower areas. Logs, rocks, cattail mats, and exposed banks are required for basking. May enter brackish water and even seawater. Found at elevations from sea level to over 5,900 ft (1,800 m) (Nafis 2015).	P	May affect. Suitable habitat present.
<i>Masticophis lateralis euryxanthus</i>	Alameda whipsnake (=striped racer)	FT	ST		Associated with chaparral and shrubland communities, but will range into adjacent grassland and woodlands (USFWS 2011).	A	No effect. Suitable habitat not present.
	Critical Habitat, Alameda whipsnake	X	-			A	No effect. Project site not located within Critical Habitat Unit.
<i>Phrynosoma blainvillii</i>	coast horned lizard	-	SSC		Inhabits open areas of sandy soil and low vegetation in valleys, foothills and semiarid mountains. Found in grasslands, coniferous forests, woodlands, and chaparral, with open areas and patches of loose soil. Often found in lowlands along sandy washes with scattered shrubs and along dirt roads, and frequently found near ant hills (Nafis 2015).	A	No effect. Project site does not align with species range (California Wildlife Habitat Relations coast horned lizard species range map 1997 update; CDFW 2015d).

<i>Thamnophis gigas</i>	giant garter snake	FT	ST		Marshes, sloughs, ponds, small lakes, low gradient streams, irrigation and drainage canals, rice fields and their associated uplands. Upland habitat should have burrows or other soil crevices suitable for snakes to reside during their dormancy period (November- mid March). Ranges in the Central Valley from Butte County to Buena Vista Lake in Kern County. Endemic to valley floor wetlands (USFWS 2012).	P	May affect. Suitable habitat present.
Birds							
<i>Agelaius tricolor</i>	tricolored blackbird	-	SSC		Nests in wetlands or in dense vegetation near open water. Dominant nesting substrates: cattails, bulrushes, blackberry, agricultural silage. Nesting substrate must either be flooded, spinous, or in some way defended against predators (Hamilton 2004).	P	May affect. Blackberry thickets and willow scrub wetlands provide suitable habitat for this species.
<i>Aquila chrysaetos</i>	golden eagle	-	FP		Uncommon resident and migrant throughout California, except center of Central Valley. Habitat typically rolling foothills, mountain areas, sage-juniper flats, desert (CDFW 2015b).	A	No effect. Suitable habitat not present.
<i>Athene cunicularia</i>	burrowing owl	-	SSC		Open, flat expanses with short, sparse vegetation and few shrubs, level to gentle topography and well-drained soils. Requires underground burrows or cavities for nesting and roosting. Can use rock cavities, debris piles, pipes and culverts if burrows unavailable. Habitats include grassland, shrub steppe, desert, agricultural land, vacant lots and pastures (CDFW 2015b).	P	May affect. Suitable habitat present. Ground squirrels present. There are 18 occurrences of burrowing owl within a 5-mile radius of the project sites (CDFW 2015c).
<i>Buteo swainsoni</i>	Swainson's hawk	-	ST		Nests in stands with few trees in riparian areas, juniper-sage flats, and oak savannah in the Central Valley. Forages in adjacent grasslands, agricultural fields and pastures (CDFW 2015b).	P	May affect. Suitable habitat present.
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	FT	SSC		Barren to sparsely vegetated sand beaches, dry salt flats in lagoons, dredge spoils deposited on beach or dune habitat, levees and flats at salt-evaporation ponds, river bars, along alkaline or saline lakes, reservoirs, and ponds (Cornell 2015).	A	No effect. Suitable habitat not present. Nearest occurrence is over 30 miles west near Vallejo (CDFW 2015c).
<i>Charadrius montanus</i>	mountain plover	-	SSC		Frequents open plains with low, herbaceous or scattered shrub vegetation below 3,200 ft (1,000 m.) (CDFW 2015).	A	No effect. Suitable habitat not present.

<i>Circus cyaneus</i>	northern harrier	-	SSC	Nests on the ground in patches of dense, tall vegetation in undisturbed areas. Breeds and forages in variety of open habitats such as marshes, wet meadows, weedy borders of lakes, rivers and streams, grasslands, pastures, croplands, sagebrush flats and desert sinks (Shuford and Gardali 2008).	A	No effect. Suitable habitat not present. Nearest occurrences are over 20 miles away (CDFW 2015c).
<i>Elanus leucurus</i>	white-tailed kite	-	FP	Typically nests in the upper third of trees that may be 10–160 ft (33-525 m) tall. These can be open-country trees growing in isolation, or at the edge of or within a forest (CDFW 2015b).	P	May affect. Suitable habitat present.
<i>Falco peregrinus anatum</i>	American peregrine falcon	FD	SD/FP	Breeds mostly in woodland, forest, and coastal habitats, near wetlands, lakes, rivers or other water on high cliffs, banks, dunes, or mounds. Will nest of human-made structures, tree or snag cavities, or old nests of other raptors (CDFW 2015b).	A	No effect. Suitable habitat not present.
<i>Geothlypis trichas sinuosa</i>	saltmarsh common yellowthroat	-	SSC	Breeds and winters in wet meadow, fresh emergent wetland, and saline emergent wetland habitats. Also breeds in valley foothill riparian, occasionally in desert riparian, annual grassland, and perennial grassland habitats (CDFW 2015b).	A	No effect. Outside species breeding range (Shuford and Gardali 2008).
<i>Grus canadensis canadensis</i>	lesser sandhill crane	-	SSC	In summer, occurs in and near wet meadow, shallow lacustrine, and fresh emergent wetland habitats. In winter, frequents moist croplands with rice or corn stubble, and open, emergent wetlands. Prefers treeless plains. Nests in remote portions of extensive wetlands or sometimes shortgrass prairies (CDFW 2015b).	A	No effect. Outside breeding range and suitable open wintering habitat not present.
<i>Grus canadensis tabida</i>	greater sandhill crane	-	ST/FP		A	No effect. Outside breeding range and suitable open wintering habitat not present.
<i>Haliaeetus leucocephalus</i>	bald eagle	FD	SE/FP	Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine. Requires large bodies of water or rivers with abundant fish, and adjacent snags (CDFW 2014b).	A	No effect. Suitable habitat not present.
<i>Icteria virens</i>	yellow-breasted chat	-	SSC	Nest in early-successional riparian habitats with a well-developed shrub layer and an open canopy. Restricted to narrow border of streams, creeks, sloughs and rivers. Often nest in dense thicket plants such as blackberry and willow (Shuford and Gardali 2008).	P	May effect. Blackberry thickets and willow scrub wetlands may provide suitable nesting habitat for this species.
<i>Lanius ludovicianus</i>	loggerhead shrike	-	SSC	Breeds in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground (Shuford and Gardali 2008).	A	No effect. Suitable habitat not present.

<i>Laterallus jamaicensis coturniculus</i>	California black rail	-	ST/FP	Yearlong resident of saline, brackish, and fresh emergent wetlands (CDFW 2014b).	A	No effect. Suitable habitat not present. Small patches of emergent vegetation occur along slough and pond edges, however, not large enough to support species.
<i>Melospiza melodia</i>	Modesto song sparrow	-	SSC	Breeds and winters in riparian, fresh or saline emergent wetland, and wet meadows. Breeds in riparian thickets of willows, other shrubs, vines, tall herbs, and fresh or saline emergent vegetation (CDFW 2014b).	P	May affect. Suitable habitat present. Willow scrub wetland may provide suitable habitat for this species.
<i>Melospiza melodia maxillaris</i>	Suisun song sparrow	-	SSC	Occurs year-round in tidal salt and brackish marshes from the Suisun Bay to Antioch. Requires medium density vegetation for nesting, perching, and protection. Exposed open ground is needed for foraging (Shuford and Gardali 2008).	A	No effect. Suitable habitat not present.
<i>Melospiza melodia samuelis</i>	San Pablo song sparrow	-	SSC	Tidal salt marshes (Shuford and Gardali 2008).	A	No effect. Suitable habitat not present.
<i>Pelecanus erythrorhynchos</i>	American White Pelican	-	SSC	Often nest in large multi-species colonies on undisturbed or remote islands and flat or moderate grade slopes. Use rocky or sandy loose substrate to make nest mounds. Forage in marshes, river/lake edges, shallow inland waters and occasionally coastal marine habitats (Shuford and Gardali 2008).	A	No effect. Suitable habitat not present.
<i>Rallus longirostris obsoletus</i>	California clapper rail	FE	SE/FP	Occur almost exclusively in tidal and brackish marshes with unrestricted daily tidal flows, well developed tidal channel networks, and suitable nesting and escape cover providing refugia during extreme high tides (USFWS 2013).	A	No effect. Suitable habitat not present.
<i>Riparia riparia</i>	bank swallow	-	ST	Riparian areas with sandy, vertical bluffs or riverbanks. Also nest in earthen banks and bluffs, as well as sand and gravel pits (CDFW 2015b).	A	No effect. Project site does not align with species range (California Wildlife Habitat Relations bank swallow species range map 1996 update; CDFW 2015d).
<i>Sternula antillarum browni</i>	California least tern	FE	SE/FP	Nest and roost in colonies on open beaches, forage near shore ocean waters and in shallow estuaries and lagoons (USFWS 2006).	A	No effect. Suitable habitat not present.
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	-	SSC	Nest in marshes with tall, emergent vegetation (e.g., tules and cattails) adjacent to deepwater (Shuford and Gardali 2008). Nesting colonies located in dense emergent wetland often along border of lake or pond. Large wetlands preferred (CDFW 2015b).	P	No effect. Large stands of emergent vegetation

Mammals

<i>Antrozous pallidus</i>	pallid bat	-	SSC		Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings (CDFW 2015b).	A	No effect. Suitable habitat not present.
<i>Lasiurus blossevillii</i>	western red bat	-	SSC		Roosting habitat includes forests and woodlands, often in edge habitats adjacent to streams or fields (CDFW 2015b).	A	No effect. Suitable habitat not present.
<i>Reithrodontomys raviventris</i>	salt marsh harvest mouse	FE	SE/FP		Restricted to saline or subsaline marsh habitats around the San Francisco Bay Area and mixed saline/brackish areas in the Suisun Bay area (USFWS 2013).	A	No effect. Suitable habitat not present.
<i>Taxidea taxus</i>	American badger	-	SSC		Open shrub, forest and herbaceous habitats with friable soils. Associated with treeless regions, prairies, park lands and cold desert areas. Range includes most of California, except the North Coast (CDFW 2015b).	P	No effect. No previous CNDDDB records of this species occurring on the delta islands.
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	FE	ST		Occur in desert-like habitats characterized by sparse or absent shrub cover, sparse ground cover, and short vegetative structure. Areas having open, level, sandy ground (USFWS 2010b).	A	No effect. Suitable habitat not present.

Sources: CDFW 2015a, CNPS 2015, USFWS 2015

Key
Federal & State Status
(FC) Federal Candidate
(FD) Federally Delisted
(FE) Federal Endangered
(FP) Fully Protected
(FT) Federal Threatened
(PT) Proposed Threatened
(SCE) State Candidate Endangered
(SCT) State Candidate Threatened
(SE) State Endangered
(SR) State Rare
(SSC) State Species of Special Concern
(ST) State Threatened
(X) Federally Designated Critical Habitat
CNPS Rare Plant Rank
<i>Rareness Ranks</i>
(1A) Presumed Extinct in California
(1B) Rare, Threatened, or Endangered in California and Elsewhere
(2B) Rare, Threatened, or Endangered in California, But More Common Elsewhere
<i>Threat Ranks</i>
(0.1) Seriously threatened in California
(0.2) Fairly threatened in California
(0.3) Not very threatened in California

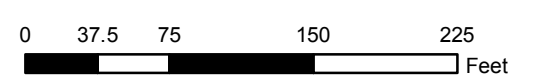
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Sources: PMC, 2013

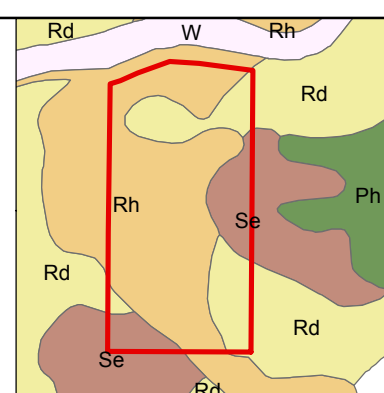
Source: Esri, DigitalGlobe, GeoEye, IGN, GeoEye, Inc., USGS, AeroGRID, IGN, Esri, Swisstopo, and the GIS User Community



Legend

- Wetland Delineation Boundary (75.8ac)
- Agricultural Surface Water 1.78ac (SW-x)
- Man-made Wet Depression 1.99ac (W-x)

Feature Name	Length (feet)	Width (feet)	Acreage
W-1	N/A	N/A	1.2
W-2	N/A	N/A	0.76
W-3	N/A	N/A	0.01
W-4	N/A	N/A	0.02
SW-1	N/A	N/A	1.35
SW-2	1304	4	0.12
SW-3	773	4	0.071
SW-4	395	4	0.036
SW-5	1011	2	0.046
SW-6	986	2	0.045
SW-7	12	6	0.002
SW-8	2104	2	0.097
Totals	6585	N/A	3.757



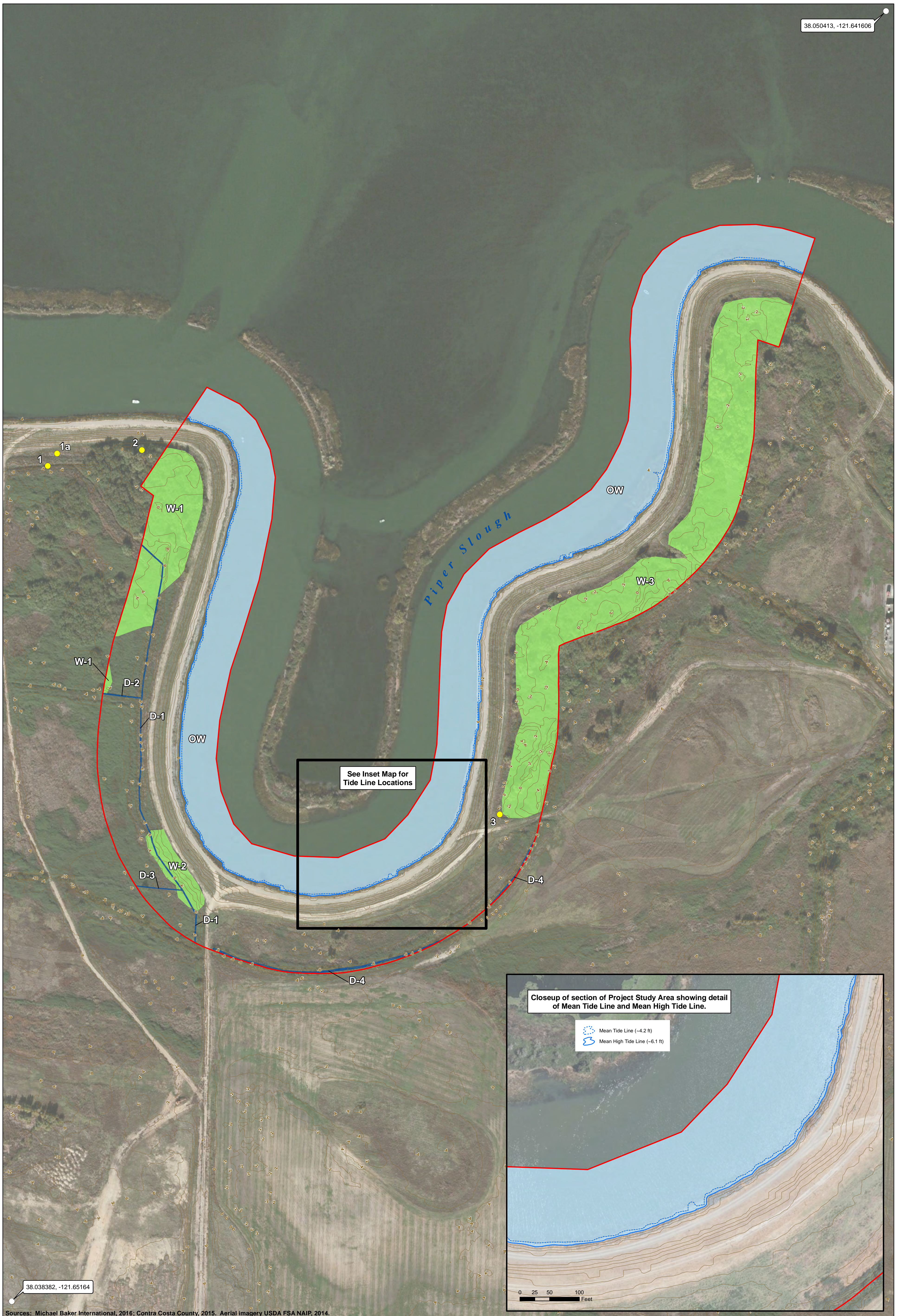
- Wetland Delineation Boundary
- NRCS Soils**
- Ph, PIPER FINE SANDY LOAM
- Rd, RIDGE MUCK
- Rh, RYDE SILT LOAM
- Se, SHIMA MUCK
- W, WATER

SCALE: 1" = 100'
 Jersey Island Quadrangle
 HUC - 18040003
 Wetlands Landgrant
 121°39'54.3"W 38°21'17.5"N
 UTM Zone 10 NAD 83

Figure 5
Crivello Property Wetland Delineation

Delineated By: Summer Pardo Drafted By: Jonathan Faoro

Delineation Date: 10/11/2012
 Revision Date: 10/28/2013

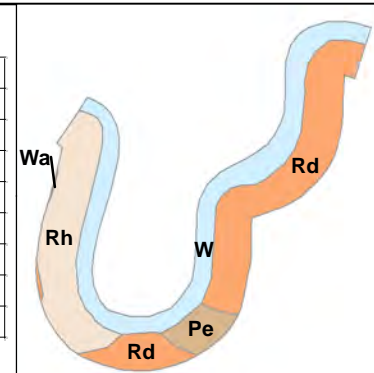


Sources: Michael Baker International, 2016; Contra Costa County, 2015. Aerial imagery USDA FSA NAIP, 2014.

Legend

- Map Reference Point
- Sample Point
- ▭ Project Study Area (47.7 ac)
- Contour Line (2-ft interval)
- ⋯ Mean Tide Line (-4.2 ft)
- Mean High Tide Line (-6.1 ft)
- W - Willow Scrub (9.8 ac)
- D - Ditch (0.4 ac)
- OW - Open Water (15.8 ac)

Map ID	Feature Type	Width(ft)	Length(ft)	Acreage
D-1	Ditch	5	1428	0.2
D-2	Ditch	5	132	0.01
D-3	Ditch	4	155	0.01
D-4	Ditch	8	990	0.2
OW-1	Open Water	N/A	N/A	15.8
W-1	Willow Scrub	N/A	N/A	2.1
W-2	Willow Scrub	N/A	N/A	0.4
W-3	Willow Scrub	N/A	N/A	7.2



- NRCS Soil Unit**
- Pe - Piper loamy sand
 - Rd - Rindge muck
 - Rh - Ryde silt loam
 - W - Water
 - Wa - Webble muck

SCALE: 1" = 150'
 Jersey Island Quadrangle
 HUC - 18040003
 Wetlands Landgrant
 121°39'54.3"W 38°2'17.5"N
 UTM Zone 10 NAD 83
 NAVD88 Vertical Datum

Figure 5
 Delineation of Wetlands and Waters
 of the Horseshoe Bend Site

Delineated By: Dayna Winchell
 Drafted By: Jonathan Faoro
 Michael Baker INTERNATIONAL
 Delineation Date: 10/11/2012
 Revision Date: 10/22/2015

0 50 100 200 300 Feet

Appendix C – California Emissions Estimator Model
Outputs – Greenhouse Gas Emissions

BIMID Crivello Property - Year 1 Hauling
Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	24.00	Acre	24.00	1,045,440.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4	Operational Year		2016	

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage identified based on an equal proportion of cubic yards of material extracted per acre of the Borrow Site.

Construction Phase - Year 1 excavation and hauling activity estimated to occur over 2 months in 2016

Off-road Equipment - No graders, dozers, or scrapers. Processing Equipment for peat separation

Trips and VMT - Haul Truck Trip Length = Distance from southern end of Borrow Site to farthest point using existing road facilities.

Grading - Acreage disturbed based on the proportion of Borrow Site acreage and material excavated

Construction Off-road Equipment Mitigation - Tier 3 mitigation

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	35.00	44.00
tblGrading	AcresOfGrading	0.00	24.00
tblGrading	MaterialExported	0.00	35,500.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	2.38

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0805	0.5836	0.7903	7.9000e-004	0.0218	0.0315	0.0534	3.6100e-003	0.0298	0.0334	0.0000	71.7083	71.7083	0.0124	0.0000	71.9686
Total	0.0805	0.5836	0.7903	7.9000e-004	0.0218	0.0315	0.0534	3.6100e-003	0.0298	0.0334	0.0000	71.7083	71.7083	0.0124	0.0000	71.9686

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0805	0.5836	0.7903	7.9000e-004	0.0218	0.0315	0.0534	3.6100e-003	0.0298	0.0334	0.0000	71.7083	71.7083	0.0124	0.0000	71.9686
Total	0.0805	0.5836	0.7903	7.9000e-004	0.0218	0.0315	0.0534	3.6100e-003	0.0298	0.0334	0.0000	71.7083	71.7083	0.0124	0.0000	71.9686

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Material to Horseshoe Bend	Grading	6/1/2016	8/1/2016	5	44	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Material to Horseshoe Bend	Crushing/Proc. Equipment	1	8.00	85	0.78
Material to Horseshoe Bend	Excavators	2	8.00	162	0.38
Material to Horseshoe Bend	Graders	0	8.00	174	0.41
Material to Horseshoe Bend	Rubber Tired Dozers	0	8.00	255	0.40
Material to Horseshoe Bend	Scrapers	0	8.00	361	0.48
Material to Horseshoe Bend	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Material to Horseshoe Bend	5	13.00	0.00	4,438.00	12.40	6.60	2.38	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Material to Horseshoe Bend - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0147	0.0000	0.0147	1.6800e-003	0.0000	1.6800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0506	0.4573	0.3554	5.2000e-004		0.0304	0.0304		0.0287	0.0287	0.0000	48.1333	48.1333	0.0120	0.0000	48.3860
Total	0.0506	0.4573	0.3554	5.2000e-004	0.0147	0.0304	0.0451	1.6800e-003	0.0287	0.0304	0.0000	48.1333	48.1333	0.0120	0.0000	48.3860

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0288	0.1247	0.4195	2.4000e-004	4.5000e-003	1.1400e-003	5.6500e-003	1.2400e-003	1.0500e-003	2.2900e-003	0.0000	21.2235	21.2235	2.3000e-004	0.0000	21.2284
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0800e-003	1.5800e-003	0.0155	3.0000e-005	2.6000e-003	2.0000e-005	2.6300e-003	6.9000e-004	2.0000e-005	7.1000e-004	0.0000	2.3515	2.3515	1.3000e-004	0.0000	2.3543
Total	0.0299	0.1263	0.4350	2.7000e-004	7.1000e-003	1.1600e-003	8.2800e-003	1.9300e-003	1.0700e-003	3.0000e-003	0.0000	23.5751	23.5751	3.6000e-004	0.0000	23.5826

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0147	0.0000	0.0147	1.6800e-003	0.0000	1.6800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0506	0.4573	0.3554	5.2000e-004		0.0304	0.0304		0.0287	0.0287	0.0000	48.1332	48.1332	0.0120	0.0000	48.3860
Total	0.0506	0.4573	0.3554	5.2000e-004	0.0147	0.0304	0.0451	1.6800e-003	0.0287	0.0304	0.0000	48.1332	48.1332	0.0120	0.0000	48.3860

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0288	0.1247	0.4195	2.4000e-004	4.5000e-003	1.1400e-003	5.6500e-003	1.2400e-003	1.0500e-003	2.2900e-003	0.0000	21.2235	21.2235	2.3000e-004	0.0000	21.2284
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0800e-003	1.5800e-003	0.0155	3.0000e-005	2.6000e-003	2.0000e-005	2.6300e-003	6.9000e-004	2.0000e-005	7.1000e-004	0.0000	2.3515	2.3515	1.3000e-004	0.0000	2.3543
Total	0.0299	0.1263	0.4350	2.7000e-004	7.1000e-003	1.1600e-003	8.2800e-003	1.9300e-003	1.0700e-003	3.0000e-003	0.0000	23.5751	23.5751	3.6000e-004	0.0000	23.5826

**BIMID - Year 1 Levee Work
Contra Costa County, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	319.86	1000sqft	7.34	319,860.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4	Operational Year		2016	

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Horseshoe Bend Levee work assumed to occur simultaneously with excavation and material hauling

Off-road Equipment - Assume dozers, tractors, and rollers

Trips and VMT -

Grading -

Construction Off-road Equipment Mitigation - Tier 3 mitigation

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	10.00	44.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.1208	1.2728	0.9724	9.6000e-004	0.4015	0.0697	0.4712	0.2195	0.0642	0.2837	0.0000	90.1855	90.1855	0.0263	0.0000	90.7380
Total	0.1208	1.2728	0.9724	9.6000e-004	0.4015	0.0697	0.4712	0.2195	0.0642	0.2837	0.0000	90.1855	90.1855	0.0263	0.0000	90.7380

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0240	0.4628	0.5822	9.6000e-004	0.4015	0.0234	0.4249	0.2195	0.0234	0.2430	0.0000	90.1854	90.1854	0.0263	0.0000	90.7379
Total	0.0240	0.4628	0.5822	9.6000e-004	0.4015	0.0234	0.4249	0.2195	0.0234	0.2430	0.0000	90.1854	90.1854	0.0263	0.0000	90.7379

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	80.12	63.64	40.12	0.00	0.00	66.38	9.82	0.00	63.46	14.35	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2016	8/1/2016	5	44	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rollers	1	8.00	80	0.38
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	8	20.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3975	0.0000	0.3975	0.2185	0.0000	0.2185	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1191	1.2704	0.9486	9.2000e-004		0.0697	0.0697		0.0641	0.0641	0.0000	86.5678	86.5678	0.0261	0.0000	87.1161
Total	0.1191	1.2704	0.9486	9.2000e-004	0.3975	0.0697	0.4672	0.2185	0.0641	0.2826	0.0000	86.5678	86.5678	0.0261	0.0000	87.1161

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6600e-003	2.4400e-003	0.0238	5.0000e-005	4.0100e-003	3.0000e-005	4.0400e-003	1.0700e-003	3.0000e-005	1.1000e-003	0.0000	3.6177	3.6177	2.0000e-004	0.0000	3.6219
Total	1.6600e-003	2.4400e-003	0.0238	5.0000e-005	4.0100e-003	3.0000e-005	4.0400e-003	1.0700e-003	3.0000e-005	1.1000e-003	0.0000	3.6177	3.6177	2.0000e-004	0.0000	3.6219

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3975	0.0000	0.3975	0.2185	0.0000	0.2185	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0224	0.4604	0.5585	9.2000e-004		0.0234	0.0234		0.0234	0.0234	0.0000	86.5677	86.5677	0.0261	0.0000	87.1160
Total	0.0224	0.4604	0.5585	9.2000e-004	0.3975	0.0234	0.4209	0.2185	0.0234	0.2419	0.0000	86.5677	86.5677	0.0261	0.0000	87.1160

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6600e-003	2.4400e-003	0.0238	5.0000e-005	4.0100e-003	3.0000e-005	4.0400e-003	1.0700e-003	3.0000e-005	1.1000e-003	0.0000	3.6177	3.6177	2.0000e-004	0.0000	3.6219
Total	1.6600e-003	2.4400e-003	0.0238	5.0000e-005	4.0100e-003	3.0000e-005	4.0400e-003	1.0700e-003	3.0000e-005	1.1000e-003	0.0000	3.6177	3.6177	2.0000e-004	0.0000	3.6219

BIMID - Year 2 Excavation & Hauling Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	45.70	Acre	45.70	1,990,692.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4	Operational Year		2017	

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage identified based on an equal proportion of cubic yards of material extracted per acre of Borrow Site

Construction Phase - Year 2 activity estimated to occur over 6 months

Off-road Equipment - No graders, dozers, or scrapers. Processing equipment to separate peat.

Trips and VMT - Haul truck trip length = distance from southern end of Borrow Site to farthest point using existing road facilities.

Grading - Acreage disturbed based on teh proportion of Borrow Site acreage and material excavated

Construction Off-road Equipment Mitigation - Tier 3 mitigation

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	75.00	133.00
tblGrading	AcresOfGrading	0.00	45.70
tblGrading	MaterialExported	0.00	70,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	2.38

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.1969	1.4988	1.9104	2.1500e-003	0.0449	0.0844	0.1294	7.7500e-003	0.0797	0.0875	0.0000	191.7660	191.7660	0.0367	0.0000	192.5361
Total	0.1969	1.4988	1.9104	2.1500e-003	0.0449	0.0844	0.1294	7.7500e-003	0.0797	0.0875	0.0000	191.7660	191.7660	0.0367	0.0000	192.5361

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.0930	1.0085	1.9758	2.1500e-003	0.0449	0.0493	0.0943	7.7500e-003	0.0492	0.0569	0.0000	191.7658	191.7658	0.0367	0.0000	192.5359
Total	0.0930	1.0085	1.9758	2.1500e-003	0.0449	0.0493	0.0943	7.7500e-003	0.0492	0.0569	0.0000	191.7658	191.7658	0.0367	0.0000	192.5359

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	52.75	32.71	-3.42	0.00	0.00	41.60	27.15	0.00	38.35	34.96	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Material to Horseshoe Bend	Grading	3/1/2017	9/1/2017	5	133	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Material to Horseshoe Bend	Crushing/Proc. Equipment	1	8.00	85	0.78
Material to Horseshoe Bend	Excavators	2	8.00	162	0.38
Material to Horseshoe Bend	Graders	0	8.00	174	0.41
Material to Horseshoe Bend	Rubber Tired Dozers	0	8.00	255	0.40
Material to Horseshoe Bend	Scrapers	0	8.00	361	0.48
Material to Horseshoe Bend	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Material to Horseshoe Bend	5	13.00	0.00	8,750.00	12.40	6.60	2.38	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Material to Horseshoe Bend - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0282	0.0000	0.0282	3.2200e-003	0.0000	3.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1406	1.2691	1.0682	1.5800e-003		0.0824	0.0824		0.0779	0.0779	0.0000	143.7963	143.7963	0.0359	0.0000	144.5495
Total	0.1406	1.2691	1.0682	1.5800e-003	0.0282	0.0824	0.1106	3.2200e-003	0.0779	0.0811	0.0000	143.7963	143.7963	0.0359	0.0000	144.5495

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0534	0.2255	0.8008	4.7000e-004	8.8800e-003	1.9900e-003	0.0109	2.4500e-003	1.8200e-003	4.2700e-003	0.0000	41.1328	41.1328	4.5000e-004	0.0000	41.1422
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8800e-003	4.2800e-003	0.0415	9.0000e-005	7.8700e-003	6.0000e-005	7.9300e-003	2.0900e-003	6.0000e-005	2.1500e-003	0.0000	6.8368	6.8368	3.6000e-004	0.0000	6.8444
Total	0.0563	0.2297	0.8423	5.6000e-004	0.0168	2.0500e-003	0.0188	4.5400e-003	1.8800e-003	6.4200e-003	0.0000	47.9697	47.9697	8.1000e-004	0.0000	47.9866

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0282	0.0000	0.0282	3.2200e-003	0.0000	3.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0368	0.7788	1.1335	1.5800e-003		0.0473	0.0473		0.0473	0.0473	0.0000	143.7961	143.7961	0.0359	0.0000	144.5494
Total	0.0368	0.7788	1.1335	1.5800e-003	0.0282	0.0473	0.0755	3.2200e-003	0.0473	0.0505	0.0000	143.7961	143.7961	0.0359	0.0000	144.5494

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0534	0.2255	0.8008	4.7000e-004	8.8800e-003	1.9900e-003	0.0109	2.4500e-003	1.8200e-003	4.2700e-003	0.0000	41.1328	41.1328	4.5000e-004	0.0000	41.1422
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8800e-003	4.2800e-003	0.0415	9.0000e-005	7.8700e-003	6.0000e-005	7.9300e-003	2.0900e-003	6.0000e-005	2.1500e-003	0.0000	6.8368	6.8368	3.6000e-004	0.0000	6.8444
Total	0.0563	0.2297	0.8423	5.6000e-004	0.0168	2.0500e-003	0.0188	4.5400e-003	1.8800e-003	6.4200e-003	0.0000	47.9697	47.9697	8.1000e-004	0.0000	47.9866

BIMID - Year 2 Levee Work Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	319.86	1000sqft	7.34	319,860.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4	Operational Year		2017	

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Levee work assumed to occur simultaneously with excavation and material hauling

Off-road Equipment -

Trips and VMT -

Grading -

Construction Off-road Equipment Mitigation - Tier 3 mitigation

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	10.00	133.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2017	9/1/2017	5	133	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2014	0.0000	1.2014	0.6604	0.0000	0.6604	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3217	3.4416	2.6199	2.6000e-003		0.1832	0.1832		0.1685	0.1685	0.0000	241.4973	241.4973	0.0740	0.0000	243.0512
Total	0.3217	3.4416	2.6199	2.6000e-003	1.2014	0.1832	1.3846	0.6604	0.1685	0.8289	0.0000	241.4973	241.4973	0.0740	0.0000	243.0512

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9800e-003	5.9300e-003	0.0574	1.3000e-004	0.0109	8.0000e-005	0.0110	2.9000e-003	8.0000e-005	2.9800e-003	0.0000	9.4664	9.4664	5.0000e-004	0.0000	9.4768
Total	3.9800e-003	5.9300e-003	0.0574	1.3000e-004	0.0109	8.0000e-005	0.0110	2.9000e-003	8.0000e-005	2.9800e-003	0.0000	9.4664	9.4664	5.0000e-004	0.0000	9.4768

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2014	0.0000	1.2014	0.6604	0.0000	0.6604	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0633	1.2940	1.5561	2.6000e-003		0.0639	0.0639		0.0639	0.0639	0.0000	241.4970	241.4970	0.0740	0.0000	243.0509
Total	0.0633	1.2940	1.5561	2.6000e-003	1.2014	0.0639	1.2653	0.6604	0.0639	0.7243	0.0000	241.4970	241.4970	0.0740	0.0000	243.0509

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9800e-003	5.9300e-003	0.0574	1.3000e-004	0.0109	8.0000e-005	0.0110	2.9000e-003	8.0000e-005	2.9800e-003	0.0000	9.4664	9.4664	5.0000e-004	0.0000	9.4768
Total	3.9800e-003	5.9300e-003	0.0574	1.3000e-004	0.0109	8.0000e-005	0.0110	2.9000e-003	8.0000e-005	2.9800e-003	0.0000	9.4664	9.4664	5.0000e-004	0.0000	9.4768

BIMID - Year 3 Excavation & Hauling Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	24.60	Acre	24.60	1,071,576.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4	Operational Year		2018	

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage identified based on an equal proportion of cubic yards of material extracted per acre of Borrow Site

Construction Phase - Year 3 activity estimated to occur over 4 months

Off-road Equipment - No graders, dozers, or scrapers. Processing equipment to separate peat.

Trips and VMT - Haul truck trip length = distance from southern end of Borrow Site to farthest point using existing road facilities.

Grading - Acreage disturbed based on teh proportion of Borrow Site acreage and material excavated

Construction Off-road Equipment Mitigation - Tier 3 mitigation

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	35.00	87.00
tblGrading	AcresOfGrading	0.00	24.60
tblGrading	MaterialExported	0.00	36,500.00
tblOffRoadEquipment	OffRoadEquipmentType		Crushing/Proc. Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	2.38

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.1036	0.8139	1.0989	1.3400e-003	0.0249	0.0451	0.0700	4.3700e-003	0.0427	0.0470	0.0000	118.3180	118.3180	0.0236	0.0000	118.8141
Total	0.1036	0.8139	1.0989	1.3400e-003	0.0249	0.0451	0.0700	4.3700e-003	0.0427	0.0470	0.0000	118.3180	118.3180	0.0236	0.0000	118.8141

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0492	0.6210	1.1535	1.3400e-003	0.0249	0.0320	0.0569	4.3700e-003	0.0319	0.0363	0.0000	118.3179	118.3179	0.0236	0.0000	118.8140
Total	0.0492	0.6210	1.1535	1.3400e-003	0.0249	0.0320	0.0569	4.3700e-003	0.0319	0.0363	0.0000	118.3179	118.3179	0.0236	0.0000	118.8140

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	52.53	23.71	-4.96	0.00	0.00	29.11	18.76	0.00	25.23	22.89	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Material to Horseshoe Bend	Grading	3/1/2018	6/29/2018	5	87	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Material to Horseshoe Bend	Crushing/Proc. Equipment	1	8.00	85	0.78
Material to Horseshoe Bend	Excavators	2	8.00	162	0.38
Material to Horseshoe Bend	Graders	0	8.00	174	0.41
Material to Horseshoe Bend	Rubber Tired Dozers	0	8.00	255	0.40
Material to Horseshoe Bend	Scrapers	0	8.00	361	0.48
Material to Horseshoe Bend	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Material to Horseshoe Bend	5	13.00	0.00	4,563.00	12.40	6.60	2.38	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Material to Horseshoe Bend - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0151	0.0000	0.0151	1.7200e-003	0.0000	1.7200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0785	0.7024	0.6869	1.0400e-003		0.0441	0.0441		0.0417	0.0417	0.0000	92.9564	92.9564	0.0232	0.0000	93.4430
Total	0.0785	0.7024	0.6869	1.0400e-003	0.0151	0.0441	0.0592	1.7200e-003	0.0417	0.0434	0.0000	92.9564	92.9564	0.0232	0.0000	93.4430

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0234	0.1091	0.3877	2.4000e-004	4.6300e-003	1.0100e-003	5.6400e-003	1.2800e-003	9.3000e-004	2.2100e-003	0.0000	21.0559	21.0559	2.4000e-004	0.0000	21.0608
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6800e-003	2.5200e-003	0.0243	6.0000e-005	5.1500e-003	4.0000e-005	5.1900e-003	1.3700e-003	4.0000e-005	1.4000e-003	0.0000	4.3057	4.3057	2.2000e-004	0.0000	4.3103
Total	0.0251	0.1116	0.4120	3.0000e-004	9.7800e-003	1.0500e-003	0.0108	2.6500e-003	9.7000e-004	3.6100e-003	0.0000	25.3616	25.3616	4.6000e-004	0.0000	25.3711

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0151	0.0000	0.0151	1.7200e-003	0.0000	1.7200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0241	0.5094	0.7415	1.0400e-003		0.0309	0.0309		0.0309	0.0309	0.0000	92.9563	92.9563	0.0232	0.0000	93.4429
Total	0.0241	0.5094	0.7415	1.0400e-003	0.0151	0.0309	0.0460	1.7200e-003	0.0309	0.0326	0.0000	92.9563	92.9563	0.0232	0.0000	93.4429

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0234	0.1091	0.3877	2.4000e-004	4.6300e-003	1.0100e-003	5.6400e-003	1.2800e-003	9.3000e-004	2.2100e-003	0.0000	21.0559	21.0559	2.4000e-004	0.0000	21.0608
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6800e-003	2.5200e-003	0.0243	6.0000e-005	5.1500e-003	4.0000e-005	5.1900e-003	1.3700e-003	4.0000e-005	1.4000e-003	0.0000	4.3057	4.3057	2.2000e-004	0.0000	4.3103
Total	0.0251	0.1116	0.4120	3.0000e-004	9.7800e-003	1.0500e-003	0.0108	2.6500e-003	9.7000e-004	3.6100e-003	0.0000	25.3616	25.3616	4.6000e-004	0.0000	25.3711

**BIMID - Year 3 Levee Work
Contra Costa County, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	71.61	1000sqft	1.64	71,610.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4	Operational Year		2018	

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Levee work assumed to occur simultaneously with excavation and material hauling

Trips and VMT -

Grading -

Construction Off-road Equipment Mitigation - Tier 3 mitigation

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	2.00	87.00
tblConstructionPhase	PhaseEndDate	6/29/2018	7/1/2018
tblProjectCharacteristics	OperationalYear	2014	2018
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0898	0.9226	0.6608	7.8000e-004	0.2555	0.0490	0.3045	0.1293	0.0451	0.1744	0.0000	70.6350	70.6350	0.0213	0.0000	71.0823
Total	0.0898	0.9226	0.6608	7.8000e-004	0.2555	0.0490	0.3045	0.1293	0.0451	0.1744	0.0000	70.6350	70.6350	0.0213	0.0000	71.0823

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0191	0.3628	0.4974	7.8000e-004	0.2555	0.0175	0.2729	0.1293	0.0175	0.1468	0.0000	70.6349	70.6349	0.0213	0.0000	71.0822
Total	0.0191	0.3628	0.4974	7.8000e-004	0.2555	0.0175	0.2729	0.1293	0.0175	0.1468	0.0000	70.6349	70.6349	0.0213	0.0000	71.0822

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	78.70	60.67	24.73	0.00	0.00	64.35	10.36	0.00	61.28	15.84	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2018	7/1/2018	5	87	

Acres of Grading (Site Preparation Phase): 43.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	
Site Preparation	Rubber Tired Dozers		1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes		1	8.00	97	0.37
Site Preparation	Graders		1	8.00	174	0.41

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2523	0.0000	0.2523	0.1285	0.0000	0.1285	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0887	0.9211	0.6458	7.4000e-004		0.0490	0.0490		0.0451	0.0451	0.0000	67.9853	67.9853	0.0212	0.0000	68.4298
Total	0.0887	0.9211	0.6458	7.4000e-004	0.2523	0.0490	0.3013	0.1285	0.0451	0.1736	0.0000	67.9853	67.9853	0.0212	0.0000	68.4298

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0300e-003	1.5500e-003	0.0149	4.0000e-005	3.1700e-003	2.0000e-005	3.1900e-003	8.4000e-004	2.0000e-005	8.6000e-004	0.0000	2.6497	2.6497	1.3000e-004	0.0000	2.6525
Total	1.0300e-003	1.5500e-003	0.0149	4.0000e-005	3.1700e-003	2.0000e-005	3.1900e-003	8.4000e-004	2.0000e-005	8.6000e-004	0.0000	2.6497	2.6497	1.3000e-004	0.0000	2.6525

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2523	0.0000	0.2523	0.1285	0.0000	0.1285	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0181	0.3613	0.4824	7.4000e-004		0.0174	0.0174		0.0174	0.0174	0.0000	67.9853	67.9853	0.0212	0.0000	68.4297
Total	0.0181	0.3613	0.4824	7.4000e-004	0.2523	0.0174	0.2697	0.1285	0.0174	0.1459	0.0000	67.9853	67.9853	0.0212	0.0000	68.4297

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0300e-003	1.5500e-003	0.0149	4.0000e-005	3.1700e-003	2.0000e-005	3.1900e-003	8.4000e-004	2.0000e-005	8.6000e-004	0.0000	2.6497	2.6497	1.3000e-004	0.0000	2.6525
Total	1.0300e-003	1.5500e-003	0.0149	4.0000e-005	3.1700e-003	2.0000e-005	3.1900e-003	8.4000e-004	2.0000e-005	8.6000e-004	0.0000	2.6497	2.6497	1.3000e-004	0.0000	2.6525

**BIMID - Year 3 Restoration Work
Contra Costa County, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	28.30	Acre	28.30	1,232,748.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4	Operational Year		2018	

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage identified based on an equal proportion of cubic yards of material extracted per acre of Borrow Site

Construction Phase - Year 3 restoration activity estimated to occur over 2 months

Off-road Equipment - No graders, dozers, or scrapers

Trips and VMT - Haul truck trip length = distance from Borrow Site to farthest point using existing road facilities.

Grading - Acreage disturbed based on teh proportion of Borrow Site acreage and material excavated

Construction Off-road Equipment Mitigation - Tier 3 mitigation

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblGrading	AcresOfGrading	0.00	28.30
tblGrading	MaterialExported	0.00	42,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	2.94

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0538	0.4041	0.7168	7.4000e-004	0.0260	0.0167	0.0427	4.3300e-003	0.0154	0.0197	0.0000	65.2102	65.2102	0.0111	0.0000	65.4441
Total	0.0538	0.4041	0.7168	7.4000e-004	0.0260	0.0167	0.0427	4.3300e-003	0.0154	0.0197	0.0000	65.2102	65.2102	0.0111	0.0000	65.4441

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0377	0.3343	0.7467	7.4000e-004	0.0260	0.0124	0.0384	4.3300e-003	0.0123	0.0166	0.0000	65.2102	65.2102	0.0111	0.0000	65.4441
Total	0.0377	0.3343	0.7467	7.4000e-004	0.0260	0.0124	0.0384	4.3300e-003	0.0123	0.0166	0.0000	65.2102	65.2102	0.0111	0.0000	65.4441

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	29.82	17.27	-4.17	0.00	0.00	26.11	10.22	0.00	20.45	15.91	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Material to Hoover Site	Grading	4/1/2018	6/1/2018	5	45	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Material to Hoover Site	Excavators	2	8.00	162	0.38
Material to Hoover Site	Graders	0	8.00	174	0.41
Material to Hoover Site	Rubber Tired Dozers	0	8.00	255	0.40
Material to Hoover Site	Scrapers	0	8.00	361	0.48
Material to Hoover Site	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Material to Hoover Site	4	10.00	0.00	5,250.00	12.40	6.60	2.94	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Material to Hoover Site - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0174	0.0000	0.0174	1.9800e-003	0.0000	1.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0253	0.2612	0.2563	3.8000e-004		0.0153	0.0153		0.0141	0.0141	0.0000	34.5167	34.5167	0.0108	0.0000	34.7424
Total	0.0253	0.2612	0.2563	3.8000e-004	0.0174	0.0153	0.0327	1.9800e-003	0.0141	0.0161	0.0000	34.5167	34.5167	0.0108	0.0000	34.7424

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0278	0.1419	0.4509	3.3000e-004	6.5700e-003	1.4100e-003	7.9800e-003	1.8100e-003	1.3000e-003	3.1100e-003	0.0000	28.9804	28.9804	3.1000e-004	0.0000	28.9868
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	1.0000e-003	9.6600e-003	2.0000e-005	2.0500e-003	2.0000e-005	2.0600e-003	5.4000e-004	1.0000e-005	5.6000e-004	0.0000	1.7132	1.7132	9.0000e-005	0.0000	1.7150
Total	0.0284	0.1429	0.4605	3.5000e-004	8.6200e-003	1.4300e-003	0.0100	2.3500e-003	1.3100e-003	3.6700e-003	0.0000	30.6935	30.6935	4.0000e-004	0.0000	30.7017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0174	0.0000	0.0174	1.9800e-003	0.0000	1.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.2800e-003	0.1914	0.2862	3.8000e-004		0.0109	0.0109		0.0109	0.0109	0.0000	34.5167	34.5167	0.0108	0.0000	34.7423
Total	9.2800e-003	0.1914	0.2862	3.8000e-004	0.0174	0.0109	0.0283	1.9800e-003	0.0109	0.0129	0.0000	34.5167	34.5167	0.0108	0.0000	34.7423

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0278	0.1419	0.4509	3.3000e-004	6.5700e-003	1.4100e-003	7.9800e-003	1.8100e-003	1.3000e-003	3.1100e-003	0.0000	28.9804	28.9804	3.1000e-004	0.0000	28.9868
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	1.0000e-003	9.6600e-003	2.0000e-005	2.0500e-003	2.0000e-005	2.0600e-003	5.4000e-004	1.0000e-005	5.6000e-004	0.0000	1.7132	1.7132	9.0000e-005	0.0000	1.7150
Total	0.0284	0.1429	0.4605	3.5000e-004	8.6200e-003	1.4300e-003	0.0100	2.3500e-003	1.3100e-003	3.6700e-003	0.0000	30.6935	30.6935	4.0000e-004	0.0000	30.7017