Background: College Lake Setting, Existing Management, and the College Lake Project

College Lake Setting

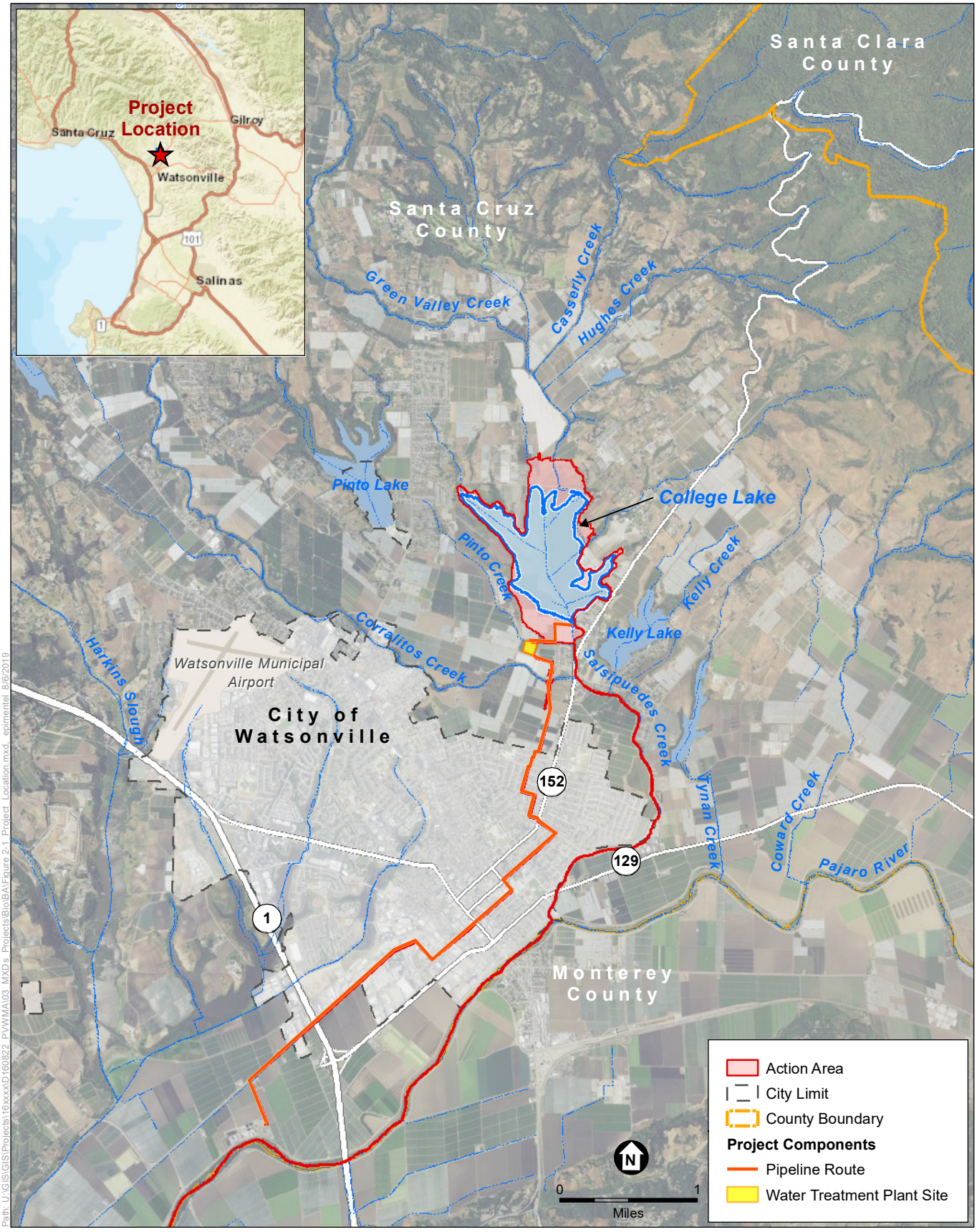
The Project area, shown on **Figure 1**, is located within the Pajaro Valley. Historically, the Pajaro Valley supported a variety of vegetation communities, including extensive riparian forests along waterways, oak savanna intermixed with grasslands in the lowland areas, mixed hardwood forests on hillsides, coastal dunes near the ocean, and coastal scrub on rocky sites. Currently, the valley is mostly agricultural with isolated patches of remnant natural vegetation communities. The Valley is drained by the Pajaro River and two of its major tributaries, Salsipuedes Creek and Corralitos Creek, as well as by Watsonville Slough and Harkins Slough.

College Lake is a naturally occurring seasonally wet depression that receives water inflows from the Green Valley, Casserly, and Hughes Creek subwatersheds. The College Lake watershed, consists of approximately 11,000 acres of range, rural residential, and crop lands.[1] Outflows from College Lake enter Salsipuedes Creek. Reclamation District 2049 (RD 2049) typically pumps the lake dry beginning in mid-March to allow agricultural use of the lakebed until measureable rainfall in the fall.

College Lake and portions of Salsipuedes Creek within the Project's maintenance areas support the following general habitat types as shown on **Figure 2**: riparian scrub, riparian forest, freshwater emergent wetland, coyote brush scrub, seasonal wetland, agriculture, farmed wetlands, annual grassland, urban/developed and upland tree groves, perennial stream, and ditch. The most common habitat types in College Lake and Salsipuedes Creek in the Project area are described below:

- **Riparian Forest:** Riparian forest occurs as a large stand in the northeast quadrant of College Lake and is also present within other portions of College Lake and its tributaries. This broadleaf deciduous forest is dominated by native riparian species including arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), black cottonwood (*Populus trichocarpa*), alder (*Alnus* spp.), western sycamore (*Platanus racemosa*), coast live oak (*Quercus agrifolia*), box elder (*Acer negundo* var. *californicum*), shining willow (*Salix lasiandra* var. *lasiandra*), and dogwood (*Cornus* sp.). Associated understory species include California blackberry (*Rubus ursinus*), nettle (*Urtica* sp.), curly dock (*Rumex crispus*), and coyote brush (*Baccharis pilularis*). These understory species are also the dominants of riparian scrub (i.e., shrub and perennial-dominated riparian vegetation).

[1] PV Water, *Final Basin Management Plan Update*, February 2014.



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SOURCE: Carollo Engineers, 2019; ESRI World Imagery, 7/23/2016; ESA, 2019

College Lake Integrated Resources Management Project

Figure 1
Project Location Map

ESA

College Lake

Pinto Creek

Holohan Rd

Corralitos Creek

Salsipuedes Creek

Kelly Lake

152

Project Area

1-foot Elevation Contour

Existing Land Cover

- Perennial Stream
- Ditch
- Freshwater Emergent Wetland
- Seasonal Wetland
- Annual Grassland
- Riparian Forest
- Riparian Scrub
- Coyote Brush Scrub
- Farmed Wetland
- Agricultural
- Urban/Developed/Upland Tree Groves

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SOURCE: USDA, 2016; ESA, 2019

College Lake Integrated Resources Management Project

Figure 2
Existing Land Cover

ESA

- **Seasonal Wetland:** Seasonal wetlands are found along the margins of College Lake and in the northwestern and eastern extensions of the lake. These areas support a wide variety of annual and perennial herbaceous species. Some dominant species include smartweed (*Persicaria* spp.), cocklebur (*Xanthium strumarium*), and rushes (*Juncus* spp.). California blackberry (*Rubus ursinus*) and Himalayan blackberry (*Rubus armeniacus*) are also prevalent in some areas.

- **Agriculture:** Agricultural fields located at elevations above approximately 62.5 feet North American Vertical Datum of 1988 (NAVD88) can be planted with berries and orchards (i.e., crops requiring a longer growing season) while agricultural fields below 65.2 feet NAVD88 are typically planted with annual vegetable row crops. Agricultural habitats are subject to periodic disking, planting, harvesting, and the application of herbicides, pesticides, and fertilizers which prevent the establishment of non-crop perennial plant species and natural habitats.

  Agricultural fields on the lakebed of College Lake are periodically fallowed, at the discretion of the farmer. In fallow years, these fields support weedy plant species, including: bristly ox-tongue (*Helminthotheca echioides*), cocklebur; swamp pricklegrass (*Crypsis schoenoides, C. vaginiflora*), fat-hen (*Atriplex prostrata*), smartweeds, and, curly dock (*Rumex crispus*).

- **Farmed Wetlands:** Farmed wetlands include agricultural areas within College Lake that support hydrological conditions of wetlands. This highly managed system presents a unique situation where farm fields provide aquatic habitat during the winter and early spring, seasonal wetland habitat for a brief period as College Lake is drawn down, arable farmland in the summer, and fallow fields in the fall and early winter.

There are special-status species that are either known to occur, or have potential to occur within the Project Area. South-central California coast (S-CCC) steelhead (*Oncorhynchus mykiss*) occur in College Lake. Based on a 2011 study, it is likely that at least some juvenile steelhead from the upper watershed spend time rearing in College Lake during winter and early spring prior to migrating out to the ocean[2].

California red-legged frog (*Rana draytonii*) and western pond turtle (*Actinemys marmorata*) have not been observed within the Project area, but have potential to occur in suitable aquatic and riparian habitat.

A variety of special-status birds have potential to forage and/or nest within the Project area including tricolored blackbird (*Agelaius tricolor*), short-eared owl (*Asio flammeus*), western burrowing owl (*Athene cunicularia*), Golden eagle (*Aquila chrysaetos*), white-tailed kite (*Elanus leucurus*), American peregrine falcon (*Falco peregrinus*), bald eagle (*Haliaeetus leucocephalus*), yellow warbler (*Setophaga petechia*), and Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*). Also, in the Project Area's riparian habitats, two special-status

[2] Podlech, M., College Lake Smolt Outmigrant Study–Spring 2011. Prepared for Resource Conservation District of Santa Cruz County, 2011.

mammals, western red bat (*Lasiurus blossevillii*) and San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), could occur.

A diverse assemblage and large number of wading birds, waterfowls, and raptors use habitats at College Lake, which is a well-known winter bird stopover location. Because of its value as waterfowl habitat, PV Water has funded annual winter-spring waterfowl surveys at College Lake since approval of the 2014 BMP Update PEIR and in 2017, began to incorporate summer-fall surveys as well. The purpose of this effort is to develop a baseline of waterfowl use of College Lake's storage area and adjacent wetland, upland, and riparian habitats. During the past five years of PV Water-funded waterfowl surveys, between 82 and 140 species have been documented at College Lake each study season.

Existing Management at College Lake

Water Management

The majority of the water in College Lake enters from the north side of the lake through Casserly Creek and is supplemented by inflows from the Green Valley and Hughes Creek subwatersheds.[3] During wet weather, flow direction in the reach of Salsipuedes Creek between College Lake and Corralitos Creek reverses due to high flows in Corralitos Creek, and surface water enters the lake as backflow from Salsipuedes Creek. During other periods, outflow from College Lake drains into Salsipuedes Creek, which is a tributary to the Pajaro River. Reclamation District (RD) 2049 pumps College Lake dry in the spring to accommodate summer farming of the lakebed. Pumping usually begins in mid-March, depending on the amount of spring rain.[4] Pumping the lake dry generally takes 30 to 40 days, typically resulting in a dry lakebed by May 1st to May 10th.[5] Intermittent pumping into Salsipuedes Creek continues after this date as needed to maintain a dry lakebed.

An existing weir with crest at elevation 60.1 feet North American Vertical Datum of 1988 (NAVD88) associated with the pumps spans the Salsipuedes Creek channel and, under certain conditions, controls the water level in College Lake.[6] When the lake water surface elevation (WSE) is at the existing weir crest elevation, approximately 228 acres of the lake basin is inundated, storing about 1,150 acre-feet of water.[7] Subsurface tile drains are present within the College Lake basin; during the summer farming period, flow from these drains is collected and pumped into a channel at the center of the College Lake basin. Water in the channel flows to the weir and pumps.

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3 College Lake Multi-Objective Management Project Final Report. Prepared for Resource Conservation District of Santa Cruz County. Prepared by cbec, inc. with assistance from Mike Podlech and Gary Kittleson. November 2014.

4 RD 2049 was formed in 1920 and was granted express legal authority under State law (California Water Code Section 50000 et. seq.) to pump water from College Lake to reclaim the land for agricultural production.

5 Peixoto, Dick, Lakeside Organic Gardens, LLC, Letter to Mary Bannister, May 12, 2014.

6 The primary purpose of the existing weir is to prevent pumped water from flowing from Salsipuedes Creek into College Lake.

7 Resource Conservation District of Santa Cruz County (RCD-SCC), *College Lake Multi-Objective Management Report Final Report*, prepared by cbec, November 14, 2014.

Farming

Once the lake has been pumped and land within the lakebed is dry enough to accommodate heavy machinery (typically around May 30th), tractors turn the soil; it then takes about one month to prepare the land for planting. Most of the crops in College Lake require at least 60 to 90 days to reach maturity, depending on the water year two crops can be grown. Growers aim to complete harvesting and other agricultural operations in the lake basin before the winter rains, generally by the end of October, although farming can and has occurred later in the year. Vegetable row crops (including varieties of kale, lettuces, and onions) comprised the largest area under cultivation from 2014 to 2018. Tree and vine crops (e.g., apples, raspberries and blackberries), comprising about 3 acres in total, are grown at higher elevations and extend to just below 64 feet NAVD88.

Farmed lands are periodically disked, planted, harvested, treated with herbicides, pesticides, and fertilizers, and periodically left fallow at the discretion of the farmer.

Mosquito Abatement

The College Lake area has a long history of seasonal floodwater mosquito production.[8] The Santa Cruz County Mosquito Abatement and Vector Control (MAVC) already implements mosquito control measures in the creek adjacent to the fairgrounds to limit hatching of floodwater mosquitos and the eastern section of Casserly Creek also has issues with mosquitoes. Access to these locations on foot has been difficult.[9]

College Lake Project

Throughout the Pajaro Valley Groundwater Basin, overdraft conditions[10] have caused groundwater levels to drop below sea level, creating a landward pressure gradient that causes seawater to move inland. Seawater intrusion has elevated the chloride concentrations in groundwater up to approximately three miles inland from the coast, in some areas contaminating the groundwater to the point that it is unsuitable for agricultural irrigation and domestic (potable) uses without treatment.

The purpose of the College Lake Project is to help balance the groundwater basin, by decreasing groundwater demands, preventing further seawater intrusion, and meeting water supply needs within PV Water's Coastal Distribution System service area by developing College Lake as a water storage and supply source for agricultural irrigation, while accommodating the release of fish bypass flows and facilitating fish passage between Salsipuedes Creek and College Lake.

8 Binding, Paul. Santa Cruz County Mosquito and Vector Control CSA 53. Comments on the Notice of Preparation for Proposed College Lake Integrated Resources Management Project. January 4, 2017

9 Conversation with Steve Driscoll, Vector Control Specialist, Santa Cruz County Mosquito and Vector Control

10 Overdraft occurs when the amount of groundwater withdrawn from a basin exceeds the volume of freshwater replenishing the basin.

Project Design

The essential function of the College Lake Project is to store water in and divert water from College Lake for treatment, transmission, and distribution for agricultural irrigation. The Project includes the following components:

- **Weir Structure and Intake Pump Station.** The Project would include a weir structure with an adjustable crest, and a diversion and intake pump station to divert surface water from College Lake. The weir would have an adjustable weir crest that would be operational through a range of 60.1 to 62.5 feet. The proposed weir crest elevation could be adjusted with one or more pneumatically actuated gates (e.g., Obermeyer Spillway Gates). The intake pump station would pump raw (untreated) water from an intake just upstream of the weir to the proposed Water Treatment Plant (WTP) via a 30-inch diameter intake pipeline.

  A fish passage structure would be located on the west side of the weir and would route fish around the diversion weir during periods when fish passage over the diversion weir is not possible.

  The proposed adjustable weir would be capable of raising the College Lake water level by up to 2.4 feet above the elevation of the existing weir to a water surface elevation of 62.5 feet NAVD88. The storage capacity of College Lake is approximately 1,150 acre feet (AF) at a water surface elevation of 60.1 feet NAVD88 and approximately 1,800 AF at a water surface elevation of 62.5 feet NAVD88.

- **Water Treatment Plant.** The WTP would remove sediment, filter and disinfect the water diverted from College Lake. The WTP would contain sedimentation basins and solids drying beds, filtration and disinfection systems, and an effluent pump station.

- **College Lake Pipeline.** The Project would include an approximately 6 mile-long, 24-inch-diameter pipeline from the proposed WTP to the Coastal Distribution System and the Recycled Water Facility.

Project Operations and Maintenance

This section describes anticipated Project operations and maintenance activities. It also includes a summary of anticipated habitat changes within College Lake from Project operations and maintenance.

Operations

Fish Passage Flows

The proposed weir structure would be designed to accommodate release of fish bypass flows and to facilitate fish passage between Salsipuedes Creek and College Lake. **Table 1** lists proposed minimum lake levels and minimum flows for fish passage for adult steelhead migration (December 15 through April 30th) and smolt outmigration (May 1 through May 31).

TABLE 1
PROPOSED FISH PASSAGE FLOWS

Proposed Fish Passage, Bypass of Casserly Creek Flows[a]	Adult Steelhead Migration		Smolt Outmigration
	Dec. 15 – Mar. 31	Apr. 1 – Apr. 30	May 1 – May 31[c]
Bypass flow between Corralitos-Salsipuedes Confluence and Pajaro River	21 cfs	8 cfs when natural flows are < 18 cfs; or 21 cfs when natural flows are ≥ 18 cfs	8 cfs
Bypass flow at weir[b] and in Salsipuedes Creek between weir and Corralitos Creek	1.8 cfs	1.8 cfs	1.0 cfs
Minimum lake level	59.5 feet NAVD88	59.5 feet NAVD88	59.3 feet NAVD88

Source: State Water Resources Control Board (2021) Right to Divert and Use Water, Draft Permit. Application AO32881

NOTES:

cfs = cubic feet per second
NAVD88 = North American Vertical Datum of 1988

[a] Instream flow requirements based on critical riffle surveys conducted in 2017 and 2018. Each minimum flow requirement would be the number specified in this table or the flow resulting from bypassing the total inflow into College Lake, whichever is less. Minimum flow between the Corralitos Creek-Salsipuedes Creek confluence and Pajaro River is for the combined flow from Corralitos Creek and College Lake. Refinements to fish passage assumptions and modeling may occur during permitting based on agency consultations.

[b] The minimum flows may be refined during design phase of the proposed weir and fish passage structure.

[c] The smolt outmigration season begins in March, but instream flow requirements for adult steelhead prior to May 1 meet or exceed the smolt requirement and are therefore protective of smolt instream flow needs.

Fish bypass releases would begin only when the water surface elevation in College Lake increases to the minimum level at which passable conditions for fish would have occurred without the existing weir in place and with flows being regulated only by the existing channel topography in Salsipuedes Creek. Based on a critical riffle analysis, these water surface elevations are 59.6 feet NAVD88 for the adult season, which corresponds to a depth of 0.6 feet at the critical riffle, and 59.3 feet NAVD88 0.4 feet of depth (59.3 feet NAVD88) for the smolt season, which corresponds to a depth of 0.4 feet at the critical riffle.[11] Releases for fish passage would not exceed total inflows into College Lake during any time step.

PV Water anticipates that other future conditions may warrant pumping flows from College Lake into Salsipuedes Creek during the summer and fall. The Project design includes a 30-inch bypass pipeline from the pump station to the downstream side of the proposed weir structure for this purpose. This bypass pipeline could be used to drain College Lake for equipment maintenance or equipment repair, to ensure the lake bottom is able to dry out for purposes of predator control, or to prevent water quality issues such as low dissolved oxygen, algal blooms, or other unforeseen issues from developing within the lake. Although PV Water is not presently able to anticipate the frequency of such operations, the bypass pipeline would be operated in compliance with all applicable regulatory permit conditions.

Proposed Weir Operations

PV Water would manage the proposed adjustable weir[12] to avoid exacerbating flood risk while retaining water from late season precipitation events for subsequent treatment and distribution to

[11] Podlech, M., *College Lake Integrated Resources Management Project, Fish Passage Assessment*, March 2019.

[12] The weir crest could be adjusted from 60.1 feet NAVD88 (the height of the existing weir) to 62.5 feet NAVD88.

irrigators in the Pajaro Valley. The proposed weir would be raised to 62.5 feet NAVD88 following the last anticipated significant storm event of the season. Factors that would affect the timing of the weir adjustment include water surface elevation and corresponding duration of drawdown, short- and long-term meteorological forecasts, and downstream channel conditions. In the event a significant storm is predicted to occur after the weir has been raised to 62.5 feet NAVD88, PV Water would initiate a pre-storm lowering of the weir from an elevation of 62.5 to 60.1 feet. cbec eco engineering conducted analyses to estimate the rate at which College Lake would drain over the proposed weir to meet pre-event drawdown criteria to prevent exacerbating existing downstream flood risks.[13] Based on the results of these analyses, lowering of the weir from 62.5 feet to 60.1 feet under existing downstream channel conditions would result in an initial draining rate at the weir of approximately 75 cfs, and this rate would decline quickly (i.e., within one hour) as Salsipuedes Creek below the weir reaches capacity.[14]

Water Supply Extractions

Anticipated typical annual water diversion rates for the Project range between 1,800 and 2,300 AF per year (AFY) and the maximum would be 3,000 AFY. PV Water has estimated monthly demands based on existing conditions for irrigation water for each modeled water year type (i.e., ranging from very wet to extremely dry). Operational criteria used in the water budget model to determine the extent to which projected monthly demand could be met included the following restrictions:

- Water supply extractions could not begin until College Lake achieves the water levels for adult steelhead migration and smolt outmigration shown in **Table 1**; and
- For the period December 15 to May 31, only College Lake inflows exceeding the proposed minimum fish bypass flows in Table 1 could be diverted to the treatment plant for irrigation supply.

Depending on water year type and time of year, monthly demand is estimated at anywhere from 14 AF to 470 AF.

Maintenance

This section describes maintenance of the Project's facilities and of the water storage area. **Table 2** summarizes these maintenance activities. Measures to avoid and minimize environmental impacts would be implemented in conjunction with these activities. The adopted and anticipated measures are provided in **Attachment 1**.

Weir Structure, Pump Station, Water Treatment Plant and College Lake Pipeline

Once the Project is fully operational, PV Water staff would periodically conduct routine inspections (e.g., for visual signs of wear and tear, obstructions or leakage) and perform scheduled maintenance of the weir structure, pump station, WTP, and pipelines. Should damage to facilities occur, PV Water would dispatch a crew to conduct the necessary repairs. Typical weir

[13] cbec, inc. eco engineering, College Lake Integrated Resources Management Project Hydrologic and Hydraulic Modeling Technical Memorandum, prepared for Environmental Science Associates by cbec, inc., November 8, 2018.

[14] cbec, inc. eco engineering, unpublished data provided to M. Podlech on February 12, 2020.

maintenance activities would include debris removal, cleaning, minor erosion control measures (including replacement of fill in eroded areas), and replacement of the weir gate. Standard equipment includes light duty trucks, small winches, crane, front end loader, haul truck, chainsaw, and hand tools. An excavator, backhoe, or crane could be required to lift metal parts from the gate or adjustable weir for maintenance or if sediment removal is required.

To the greatest extent feasible, inspections, maintenance, and repairs to the weir and intake structure will be conducted during periods of low water surface elevations in the lake (i.e., late summer and early fall). However, dewatering of the channel surrounding these structures may be necessary at times. The anticipated frequency of dewatering activities is not expected to exceed once every five years and would occur at a time of year when water surface elevations are low.

Dewatering of surface water could occur by isolating the work area through the use of sheet-pile coffer dams and bypassing flows around the construction site. A passive gravity bypass system could be used if feasible. If not feasible due to site conditions, water may be actively pumped around the work area using pumps. Bypass pumps will be screened in accordance with current National Marine Fisheries Service (NMFS) and California Department of Fish and Wildlife (CDFW) guidelines.

If subsurface water is encountered, the water would be discharged to agricultural lands, storm drains, or other waterways, and would be discharged in accordance with applicable regulatory requirements. The contractor would treat water from excavated areas as necessary prior to discharge. The treatment could include settling tanks or filter bags to allow sediment to settle out.

TABLE 2
SUMMARY DESCRIPTION OF ANTICIPATED MAINTENANCE ACTIVITIES

Activity	Frequency	Anticipated Annual Quantity	Seasonal Timing	Description
Weir, pipeline, pump station Inspections	Weekly	—	Year-round	—
Weir, pipeline, pump station repair	As needed	1	Year-round	Typically, an unscheduled activity conducted when facilities are damaged. Standard equipment would include light duty trucks, small winches, crane, front end loader, haul truck, chainsaw, and hand tools.
Weir repair or maintenance requiring dewatering	As needed	0.2 (1 in 5 years)	Summer – fall	Channel adjoining weir dewatered for weir maintenance and repair.
Weir maintenance	Annually	3	Late summer – early fall	Typical weir maintenance activities would include debris/sediment removal, cleaning, minor erosion control measures (including replacement of fill in eroded areas), and replacement of the weir gate. Standard equipment would be the same as for weir repair.
Sediment and debris removal	Annually	Up to 11,700 cubic yards of sediment	Late summer – early fall	Sediment deposited in channels would be removed every 1–2 years (from 0–100 % of channel length/year), typically by using excavators and bulldozers to load material onto haul trucks for transport to landfill or other upland location. Sediment deposits outside of channels would also be removed in some years.
Channel reshaping	Periodic	1 site	Late summer – early fall	Channel banks "laid back" (bank angle decreased) or other modifications are made to reduce erosion or encourage deposition in away from weir and pumps.
Vegetation management —channels	Annually	1.4 acres[1]	Late summer – early fall	Aquatic vegetation in channels is removed in association with sediment and debris removal. Removal is mechanical using a drag-line and excavator bucket. Removed aquatic vegetation is loaded into haul trucks and deposited in a landfill or upland location.
Vegetation management —lakebed	Annually	75 acres[2]	Late summer – early fall	Uncultivated areas of the lakebed that are not already in woody riparian vegetation are disked, tilled, ripped or mowed every 1–2 years to prevent new establishment of woody plants that could trap sediment, or restrict flow or drainage.

Source: Table content adapted from Draft College Lake Integrated Resources Management Project Environmental Impact Report (PV Water 2019) and draft permit applications for the Project.

Notes:

[1] Corresponds to acreage of entire existing ditch system

[2] Corresponds to the existing acreage of farmed wetland below an elevation of 59 feet NAVD88 and potentially uncultivated in most years after project implementation.

College Lake Water Storage Area

PV Water would conduct routine (annual or semi-annual) vegetation management and sediment and debris removal activities within College Lake to:

- Preserve water storage capacity
- Avoid exacerbating existing flood hazards[15]
- Manage habitat in a manner consistent with requirements established in permits and approvals and in accordance with the Adaptive Management Plan.

These maintenance activities may occur in the lake's existing ditches and channels, on portions of the lakebed, and upstream of the weir structure. The amount of these activities needed in any given year would depend on weather and hydrologic conditions, and frequency and extent of past maintenance activities. Additional details regarding methods and timing of maintenance activities would be determined once the Project has been implemented.

Vegetation Management

Figure 3 depicts areas proposed for vegetation management; these are areas that are farmed under baseline conditions and that are expected to support seasonal wetland vegetation with implementation of the Project. Vegetation management would not reduce the current extent of riparian forest but aims to limit new establishment of woody riparian plants that could trap sediment and restrict flow or drainage. PV Water is not proposing any specific vegetation management activities within the existing riparian forest habitat on land currently owned by the PV Water.

In general, areas below 59 feet NAVD88 in elevation would be managed as open water habitat during the wet season. Vegetation management in this area during the dry season would sustain open water habitat during the wet season. Vegetation management methods would include disking, tilling, and ripping. Vegetation may also be trimmed or mowed if necessary. These activities may occur in most or all years. Removal of flow-constricting vegetation within channels and around Project components and equipment may also occur annually. Aquatic vegetation in channels may also be removed mechanically using a drag-line and excavator bucket, and in association with sediment and debris removal described below. Debris from vegetation management would be loaded into haul trucks and deposited in a landfill or upland location

The Project's Mitigation and Monitoring Reporting Program includes measures to avoid and minimize impacts to existing habitat features in College Lake and additional measures are being determined in consultation with regulatory agencies with approval authority over the Project. See

[15] The Santa Cruz County Flood Control and Water Conservation District Zone 7 (Zone 7) is responsible for the provision of drainage improvements in the Project area. Zone 7 was formed for the primary purpose of improving the flood carrying capacity of the Pajaro River, Salsipuedes, Creek and Corralitos Creek systems within the Pajaro Valley floodplain. This is achieved through funding the maintenance of and minor capital improvements to existing drainage facilities within the zone's boundaries. Santa Cruz County Flood Control and Water Conservation District Zone 7 does not currently have an existing stream maintenance plan or other adopted sediment management plan for the College Lake area. (County of Santa Cruz Department of Public Works, Flood Control and Water Conservation District: Zone No. 7, 2019. Available online at http://www.dpw.co.santa-cruz.ca.us/Home/FloodControlStormwater/FCWCZone7.aspx. Accessed on April 10, 2019.)

Attachment 1 for adopted and proposed measures for avoiding and minimizing impacts of maintenance activities.

Sediment and Debris

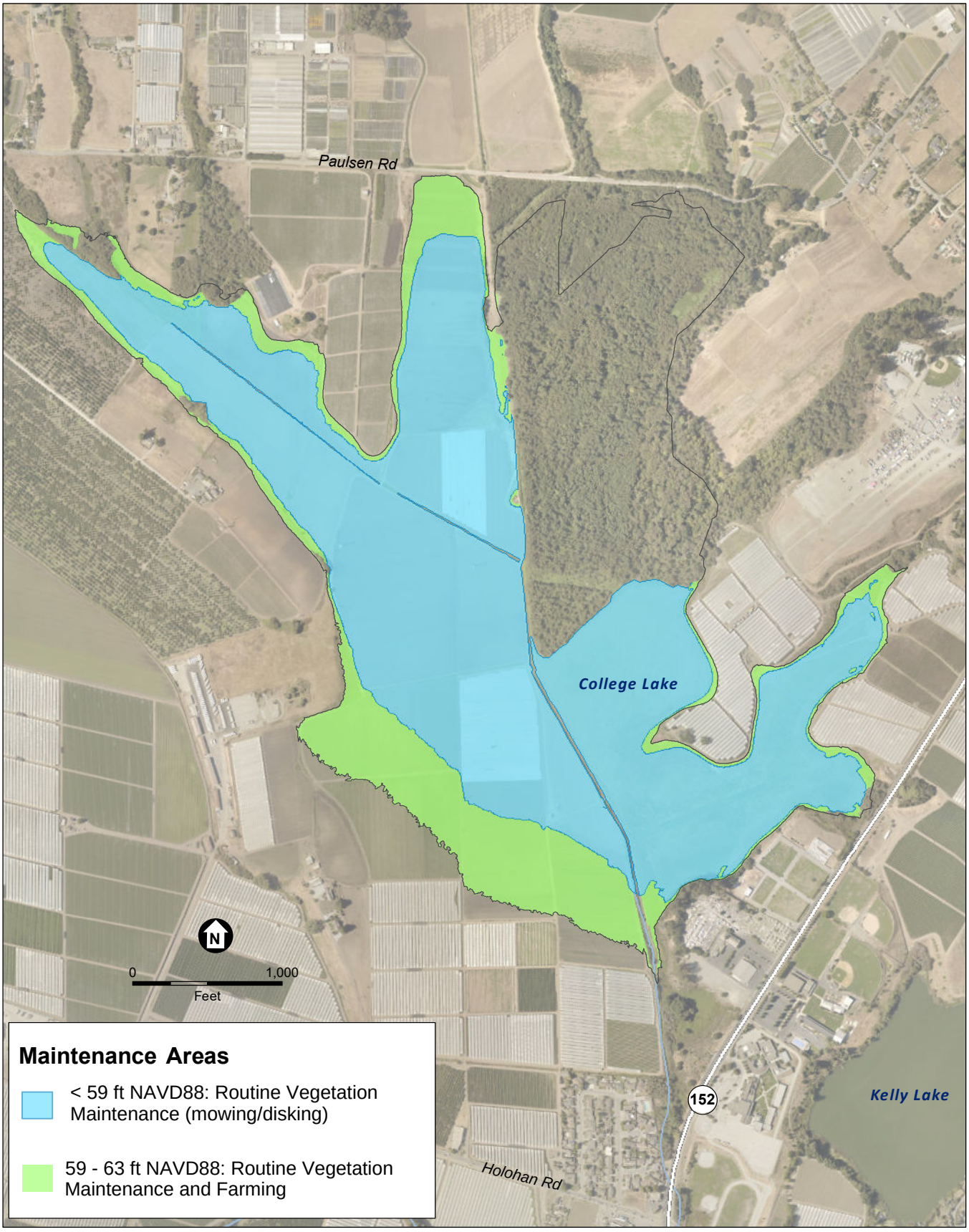
PV Water would remove excess sediment and debris from certain areas of College Lake and upstream of the weir structure. The need for sediment removal would be evaluated annually during routine facility monitoring.

Sediment removal is the act of mechanically removing sediment that has deposited within a channel, typically using excavators and bulldozers, loading material onto haul trucks. Sediment and debris removal would be conducted during the dry season, and could be implemented if sediment accumulations (for example) impede fish passage, compromise channel capacity, reduce storage capacity or impair operation of the proposed weir and intake structure. Channels within the lakebed may also be reshaped to minimize bank erosion (e.g., laying back banks), encourage sediment deposition in areas of the lake away from the weir, and help minimize stranding of fish as water levels recede.

Removed sediment and debris would be hauled to the Buena Vista Landfill or other location for disposal.

Inundation and Land Cover Changes Resulting from Operations and Maintenance

Operations would alter the duration and timing of inundation at College Lake, requiring changes in existing land use activities. Associated changes in land cover are also anticipated. **Table 3** summarizes these anticipated changes. The primary effect is anticipated to be on the extent of farmed wetlands below an elevation of 59 feet NAVD88. These farmed wetlands are frequently submerged or in seasonal wetland vegetation for part of the year and also in agricultural production for part of the year. With operation of the Project, these farmed wetlands would be more frequently inundated for longer periods of time, which would preclude or substantially reduce the frequency of their cultivation.



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SOURCE: USDA, 2016; ESA, 2018

Note: NAVD88 = North American Vertical Datum of 1988

College Lake Integrated Resoures Management Project

Figure 3
Proposed Maintenance Areas within College Lake

ESA

Table 3
Anticipated Changes to Inundation Periods and Land Cover at College Lake

Maintenance Area	Water Surface Elevation (feet NAVD88)	Existing Inundation Period[a]	With Project Inundation Period (62.5 foot weir)[b]	Land Cover (Wetland/Water/Upland)	With Project Land Cover, Anticipated Change
Routine Vegetation Maintenance (mowing/disking) (< 59 feet NAVD88)	50 up to 57	4-7 months	7-11 months	Ditch (Other Water)	No land cover type change. Ditches would be continued to be managed for water conveyance and fish passage.
				Farmed Wetland (Wetland) Consists of: 1. Open water (November 1 to March 31) 2. Seasonal wetland vegetation (April 1 to May 31) 3. Agriculture[c] (June 1 to October 31)	Farmed wetland would convert to managed seasonal wetland which would consist of: 1. Open water (November 1 to July or August) 2. Mudflat with sparse seasonal wetland vegetation (July or August to October 31) No farming would occur at this elevation with the Project. Vegetation management (mowing, disking) would occur annually to maintain open water and mudflat and prevent woody plant encroachment.
				Riparian Forest (Wetland)	No land cover type change. Riparian Forest present below 57 feet NAVD88 is expected to persist with its current riparian species composition and abundance in the short term but may shift in species composition and abundance in the future with a dominance of inundation-tolerant species such as Pacific willow (*Salix lasiandra*), and possibly a sparser overstory canopy with freshwater emergent plants in the understory. A small 0.7-acre area of freshwater emergent wetland occurs within the larger riparian forest and would not be actively maintained.
				Seasonal Wetland (Wetland)	No land cover type change, though seasonal wetlands that are not currently managed annually through mowing and tilling would be subject to these management practices in the future to prevent woody plant encroachment. The increase in management frequency, combined with the longer inundation period in this elevation range would likely result in sparser vegetation, dominated by annual species.
	57 up to 59	4 months	6-7 months	Ditch (Other Water)	No land cover type change. Ditches would be continued to be managed for water conveyance and fish passage.
				Farmed Wetland (Wetland) Consists of: 1. Open water (December 1 to March 31) 2. Seasonal wetland vegetation (April 1 to May 31) 3. Agriculture[c] (June 1 to November 30)	Farmed wetland would convert to managed seasonal wetland, similar to 50 to 57 feet NAVD88. No farming would occur at this elevation with the Project. Vegetation management (mowing, disking) would occur annually to maintain open water, mudflat, and seasonal wetland and prevent woody plant encroachment.
				Riparian Forest (Wetland)	No land cover type change, though species composition may change as this forest matures and older trees senesce. A small 0.2 acre area of freshwater emergent wetland occurs within the larger riparian forest and would not be actively maintained.
				Seasonal Wetland (Wetland)	No land cover type change. This area would be managed as seasonal open water and wetland through mowing and disking, to prevent woody plant encroachment, similar to existing conditions.
Routine Vegetation Maintenance and Farming (59-63 feet NAVD88)	59 up to 62	1-4 months	2-6 months	Ditch (Other Water)	No land cover type change. Ditches would be continued to be managed for water conveyance and fish passage.
				Farmed Wetland (Wetland) Consists of: 1. Open water (January 1 to March 31) 2. Seasonal wetland vegetation (April 1 to May 31) 3. Agriculture[c] (June 1 to December 30)	No land cover type change. Although this elevation range would be inundated for longer durations (especially at the lower end of the range) these areas would continue to be used for seasonal crops in years and locations where at least one crop rotation is feasible. Areas that are not farmed would be managed as seasonal open water and wetland through mowing and disking, to prevent woody plant encroachment, similar to existing conditions.
				Riparian Forest (Wetland)	No land cover type change.
				Seasonal Wetland (Wetland)	No land cover type change.
	62 up to 63	1-6 weeks, not continuous	2-8 weeks, not continuous	Ditch (Other Water)	No land cover type change. Ditches would be continued to be managed for water conveyance and fish passage.

				Farmed Wetland (Wetland)	No land cover type change. Although this elevation range would be inundated for longer durations these areas would continue to be used for seasonal crops in years and locations where at least one crop rotation is feasible. Areas that are not farmed would be managed as seasonal open water and wetland through mowing and disking, to prevent woody plant encroachment, similar to existing conditions.
				Riparian Forest (Wetland)	No land cover type change.
				Seasonal Wetland (Wetland)	No land cover type change.
				Agriculture (Upland)	Farmed wetland. This is not likely to change the land use practices or habitat value.[d]
				Annual Grassland (Upland)	Seasonal Wetland.
None/No Maintenance Action (>63 feet NAVD88)	63 up to 64	1-6 weeks, not continuous	2-8 weeks, not continuous	Ditch (Other Water)	No land cover type change. Ditches would be continued to be managed for water conveyance and fish passage.
				Farmed Wetland (Wetland)	No land cover type change. Although this elevation range would be inundated for longer durations these areas would continue to be used for seasonal crops in years and locations where at least one crop rotation is feasible. Farmers may continue to manage farmed wetlands for agricultural purposes.
				Riparian Forest (Wetland)	No land cover type change.
				Seasonal Wetland (Wetland)	No land cover type change.
				Agriculture (Upland)	Farmed wetland. This is not likely to change the land use practices or habitat value.[d]
				Annual Grassland (Upland)	Seasonal Wetland.
				Riparian Scrub (Upland)	No land cover type change
	64 up to 70	Periodic inundation of one week or less	Periodic inundation of one week or less	Ditch (Other Water)	No land cover type change. Ditches would be continued to be managed for water conveyance and fish passage.
				Farmed Wetland (Wetland)	No land cover type change. These farmed wetlands are currently supported by seeps and not by inundation of the College Lake Basin. So changes in the College Lake basin hydrology would not likely change these farmed wetlands. Farmers may continue to manage farmed wetlands for agricultural purposes.
				Riparian Forest (Wetland)	No land cover type change. This land cover type is not expected to change as a result of water operations in College Lake.
				Seasonal Wetland (Wetland)	No land cover type change. These seasonal wetlands are currently supported by seeps and not by inundation of the College Lake Basin. So changes in the College Lake basin hydrology would not likely change these farmed wetlands
				Agriculture (Upland)	No land cover type change. This land cover type is not expected to change as a result of water operations in College Lake.
				Annual Grassland (Upland)	No land cover type change. This land cover type is not expected to change as a result of water operations in College Lake.
				Coyote Brush Scrub (Upland)	No land cover type change. This land cover type is not expected to change as a result of water operations in College Lake.
				Riparian Scrub (Upland)	No land cover type change. This land cover type is not expected to change as a result of water operations in College Lake.
				Developed (Upland)	No land cover type change. This land cover type is not expected to change as a result of water operations in College Lake.

NOTES:
[a] Based on observed water surface elevation during 2016.
[b] Based on the modeled above-average rainfall year (2016). See Appendix HYD and Figures 3.3-7a through 3.3-7d in Section 3.3, Surface Water, Groundwater, and Water Quality in College Lake EIR.
[c] Agriculture includes a fallow period after harvest during which time fields are bare, tilled soil.
[d] The anticipated change of agricultural land to farmed wetland would not affect the agricultural land use of this area.

SOURCE: Draft College Lake Integrated Resources Management Project Environmental Impact Report (PV Water 2019). SCH# 2017112063