CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter summarizes environmental consequences associated with the alternatives considered in the EIS. Impact assessments are presented for three alternatives. As described in Chapter 2, the Alternatives are based on specific assumptions for implementation of PVWMA's Import Water Project and Recycled Water Project as compared to the No Action Alternative.

The analytical tool or tools used and associated analytical methodology is described for each issue area. Environmental consequences associated with each of the alternatives considered in the EIS are described for the following resources listed below. These resources were identified for evaluation in this EIS based on the Revised BMP EIR, which evaluated the Water Recycling Project and Import Water Project in detail, and agency and public comments submitted during the scoping process.

- Land Use
- Geology, Soils, Seismicity, and Hazardous Materials
- Water Resources and Water Quality
- Vegetation, Fish and Wildlife
- Cultural Resources
- Indian Trust Assets
- Air Quality
- Environmental Justice
- Socioeconomics
- Cumulative Impacts
- Relationship of Short-Term Uses and Long-Term Productivity
- Irreversible and Irretrievable Commitments of Resources

4.2 LAND USE

4.2.1 ALTERNATIVE A – NO ACTION

Without a supplemental water supply project, it is assumed that basinwide pumping restrictions would be imposed in order to bring the groundwater basin into balance and to curtail seawater intrusion. This action would restrict agricultural water supplies to 12,200 afy, an 80 percent reduction from current levels. It is expected that approximately 25,660 acres of existing farmland could no longer be used for irrigated agriculture since no groundwater would be available. Under the basinwide pumping restriction scenario, urban uses would continue to extract 11,800 afy from the groundwater basin (demand is assumed to remain at current levels).

The No Action Alternative would not result in any construction-related disturbance impacts associated with Alternative B or C, such as the temporary disruption of farming or adverse effects to sensitive habitats and threatened and endangered species due to pipeline trenching.

IMPAIRMENT OF AGRICULTURAL RESOURCES

Reducing groundwater pumping throughout the basin would reduce water supply for all agricultural water users in the Pajaro Valley. Agricultural production on the 30,350 acres of irrigated agricultural land in the Pajaro Valley would be severely impaired, resulting in approximately 25,660 acres of lost agricultural production (refer to Appendix H for details).[1] Over time, the loss in revenues, employment, and land values would likely create pressure for conversion of fallowed farmland to other uses that require less water than agriculture, or can afford more expensive water.

CONVERSION OF IRRIGATED AGRICULTURE TO MUNICIPAL AND INDUSTRIAL USES

Municipal and industrial (M&I) development can afford water supplies that are not economical for agriculture, such as desalination. A potential effect of land fallowing could be urbanization of agricultural lands. The amount of agricultural lands that could be urbanized under the No Action Alternative is speculative.

The Revised BMP Draft EIR (pp. 7-8 through 7-12) summarizes the potential environmental effects resulting from urban development in the Watsonville area. The effects include[2]:

- degraded traffic operation on City roadways;
- air quality impacts resulting from development construction;

1 Since there is considerable multiple cropping in the Pajaro Valley (multiple crops on the same property), production acreage is greater than farmland acreage.

2 The following documents were reviewed in order to identify representative impacts associated with urban growth in the area: Watsonville 2002 General Plan Update and Sphere of Influence Amendment Environmental Impact Report (1993), and the Seaview Ranch Project Environmental Impact Report (2001).

- noise impacts resulting from development construction and potential ambient noise impacts on additional residential and employee populations;
- increased demands on police, fire protection, schools, libraries, solid waste services, sewer/wastewater services, and water supply/water quality services;
- conversion of existing open space uses (mostly farmland), removing the scenic and recreational resources these lands provide, degradation of other existing scenic resources within the city, and increased demand for park land and recreation facilities;
- change in the visual character of the project area due to conversion from rural to urban;
- new sources of nighttime light in the area;
- exposure of additional population and new structures to seismic hazards and related soil effects;
- exposure of persons and property to potential flooding impacts, increased surface runoff, and requirement for construction of new or improvements to drainage facilities;
- significant impacts to special-status species, riparian vegetation, historic trees, and wetlands;
- exposure of people to potential hazards from the use, storage, and transport of hazardous materials, and from agricultural chemicals that could cause water pollution; and
- impacts to cultural resources related to ground disturbance from development construction, and potential alterations to the historic character of land uses or structures.

With the exception of two impacts – the conversion of loss of open space uses and changes in visual character (from rural to urban) – these impacts could be reduced to less-than-significant levels through adoption and implementation of mitigation measures.

4.2.2 ALTERNATIVE B – WATER RECYCLING PROJECT AND IMPORT WATER PROJECT

CONVERSION OF LANDS TO MUNICIPAL AND INDUSTRIAL USES

With respect to the project's potential to induce urban development, Chapter 7 of the Revised BMP EIR concluded that implementation of the Proposed Project would remove an obstacle to growth by increasing the water supply and the reliability of existing groundwater resources in the PVWMA service area. Under the Proposed Action, PVWMA would distribute water only to agricultural land that is currently irrigated with groundwater. This would reduce pumping of the groundwater basin and, over time, allow stabilization of the groundwater basin and reduction of the overdraft conditions that allow seawater intrusion. By replacing agricultural pumping with surface water supplies, the project would improve the reliability of the groundwater basin for non-agricultural, urban uses as well. Improving the reliability of the urban water supply would facilitate urban growth.

While the Proposed Action provides water only to agricultural uses, it is PVWMA's objective and responsibility to implement a plan that prevents further overdraft and seawater intrusion in

the long-term. Therefore, PVWMA accounted for projected future (2040) urban water demands in order to plan long-term groundwater basin management. Refer to Section 1.2.3 of Chapter 1 of this EIS for a discussion of PVWMA water demand forecasts; for more detail, refer to pp. 4.C-5 through 4.C-7 in the Revised BMP DEIR. As described in the DEIR, the project could accommodate an amount of growth that is consistent with regional growth projections.

Note that while PVWMA forecast demand to year 2040, the water quantities associated with the Proposed Project (e.g., the 18,500 afy needed) represent existing demand. After 2007, PVWMA will reassess (then) future demand characteristics and develop future supply sources accordingly.

As indicated in Section 4.2.1, land fallowing that would occur with implementation of the No Action Alternative would create pressures for urbanization of agricultural lands. Whether the amount of lands that would be urbanized under the No Action Alternative would be less than, equal to, or greater than growth indirectly induced by implementation of either Alternative B or C cannot be determined without speculation.

It is important to note that PVWMA does not have the authority or jurisdiction to make land use and development decisions, nor to implement the measures necessary to mitigate the effects of that growth. Authority to implement such measures lies with the land use jurisdictions – the City of Watsonville, Monterey County, Santa Cruz County, and San Benito County, which enforce local, state and federal regulations and mitigation requirements through the development approval, CEQA and permit processes. Likewise, Reclamation does not have authority over land use changes.

SHORT-TERM DISTURBANCE OF ADJACENT LAND USES

Import Water Project, Integrated Coastal Distribution System, and Water Recycling Project

The proposed facilities would not alter surrounding land uses and would not be incompatible with existing uses in the vicinity. Construction disturbance could temporarily disrupt daily access to surrounding land uses, including farmland, industrial and commercial uses, residences, and schools, by blocking roadways and access driveways. Construction associated with the Import Water Project could temporarily constrain access to uses along Betabel Road, SR 129, Murphy Road, Quarry Road / Aromas Road, and Hayes Road. Construction of pipelines connecting the supplemental wells to the Import Pipeline could temporarily constrain access to adjacent farmlands along roadways. The precise locations of construction disturbance are not known since the well sites have not been identified; however, they would occur within the siting area identified in **Figure 2.2** in Chapter 2. Construction associated with the ICDS could temporarily constrain access to uses along SR 1, San Andreas Road, Beach Road, Jensen Road, Bluff Road, Trafton Road, Springfield Road, Struve Road, and Giberson Road, among others. Construction of the Water Recycling Project, including associated pipelines, could constrain access to adjacent farmlands along S.R. 1 and Panabaker Road. However, this would be a temporary impact that results more in inconvenience to motorists than a substantial impact, and, therefore, would not be expected to substantially impair operations at nearby land uses. Typical construction activities

would be expected to last approximately one week at any given location along pipeline alignments. Construction of the proposed facilities would generate noise, dust, and traffic that could disrupt activities at some adjacent land uses such as schools. PVWMA adopted as conditions of project approval a series of measures to reduce these disturbance impacts (see Appendix D).

DISRUPTION OF AGRICULTURE

Import Water Project and Integrated Coastal Distribution System

The pipeline alignments extend through prime farmlands and lands under Agricultural Preserve or Williamson Act contracts. The proposed Import Pipeline and ICDS would not result in the permanent conversion of agricultural land. Pipeline construction activities would temporarily affect agricultural production. The alignments are located with agricultural lands adjacent to roadways in many locations, and traverse several farms as well. In some areas where the alignments remain in the public right-of-way the construction easement would affect adjacent agricultural uses. Project construction could disrupt agricultural production within the alignments for at most one cropping season, depending on the timing of construction. Construction disturbance would be temporary, and operation of the Import Pipeline and ICDS, once installed, would not preclude agricultural production. The pipelines may limit some types of crop selections, specifically deep-rooted trees. Other agricultural uses could continue on the alignment.

Water Recycling Project

Construction of the proposed WRF would result in the conversion of approximately eight acres of Prime Farmland from agricultural use to water treatment and storage facilities, thereby precluding farming on the project site. Because all surrounding lands are considered Prime Farmland, no feasible alternative site is available that would reduce or avoid the conversion of Prime Farmland. Development of the Water Recycling Project would therefore contribute to the cumulative loss of Prime Farmland in the region.

The five supplemental wells would result in the conversion of 6,000 square feet (approximately 0.2 acre) of agricultural land. **Figure 2.2** indicates the general area where these wells would be located. The siting area includes both prime and nonprime agricultural land. Because the specific well sites have not been identified, this analysis assumes a worst-case scenario in which all the wells would be sited on Prime Farmland, resulting in a permanent loss of 0.2 acre of Prime Farmland.

While Alternative B would result in the loss of prime farmland, it would be substantially less adverse than the No Action Alternative – Basinwide Pumping Restrictions scenario, which would result in an estimated 25,660 acres being fallowed or converted to rangeland. As discussed previously, this would not be considered a permanent loss of farmland, since the land would not be automatically converted to another use, and could be farmed again if a water supply were secured in the future.

The proposed pipelines would not result in a long-term loss of agricultural land because they would be located underground, and farming as occurs at present would resume within the construction corridor following pipeline installation.

4.2.3 ALTERNATIVE C – IMPORT WATER PROJECT ONLY

CONVERSION OF LANDS TO MUNICIPAL AND INDUSTRIAL USES

Impacts would be the same as for Alternative B.

SHORT-TERM DISTURBANCE OF ADJACENT LAND USES

Import Water Project and Integrated Coastal Distribution System

Impacts would be the same as for Alternative B.

DISRUPTION OF AGRICULTURE

Import Water Project and Integrated Coastal Distribution System

Under Alternative C, construction of ten injection/extraction wells would result in the conversion of approximately 20,000 square feet (0.5 acre) of agricultural land. **Figure 2.2** indicates the general area where these wells would be located. The siting area includes both prime and non-prime agricultural land. Because the specific well sites have not been identified, this analysis assumes a worst-case scenario in which all the wells would be sited on Prime Farmland, resulting in a permanent loss of 0.5 acre of prime farmland.

While Alternative C would result in the loss of less than one acre of prime farmland, it would be substantially less adverse than the No Action Alternative – Basinwide Pumping Restrictions scenario, which would result in an estimated 25,660 acres of prime farmland being fallowed or used as rangeland.

The proposed pipelines that would connect the injection/extraction wells to the Import Pipeline would not result in a long-term loss of agricultural land because they would be located underground, and farming as occurs at present would resume within the construction corridor following pipeline installation.

4.2.4 CUMULATIVE IMPACTS

Section 4.11 of this Draft EIS evaluates cumulative impacts. Implementation of Alternative B or C, in conjunction with CVP contract assignments to PVWMA, could contribute to cumulative changes in agricultural practices and land use in the San Joaquin Valley (e.g., land retirement). However, these changes are primarily occurring due to economic and environmental conditions. These changes often result in the need for less CVP water on those lands, resulting in requests for approval of water service transactions. Under the No Action Alternative, those conditions will

continue. Agricultural practices and land uses in the San Joaquin Valley would not change significantly with implementation of either Alternative B or Alternative C.

4.3 GEOLOGY, SOILS, SEISMICITY, AND HAZARDOUS MATERIALS

4.3.1 ALTERNATIVE A – NO ACTION

Short-term land use changes resulting from basinwide pumping restrictions include fallowing of approximately 25,660 acres of farmland. This likely would result in a reduction in soil erosion from agriculture.

Over the long term, the socioeconomic impacts resulting from the land fallowing could create pressure for conversion to municipal and industrial (M&I) uses. New M&I development could result in site-specific impacts related to soils and seismicity (e.g., liquefaction and groundshaking hazards).

4.3.2 ALTERNATIVE B – WATER RECYCLING PROJECT AND IMPORT WATER PROJECT

DAMAGE FROM UNSTABLE SLOPES AND SLOPE FAILURE

Import Water Project

In several areas along the Import Pipeline alignment, locally steep slopes may occur along riverbanks and drainage channels (see **Table 4.3.1**).

TABLE 4.3.1
AREAS OF UNSTABLE SLOPES ALONG THE IMPORT PIPELINE ALIGNMENT

Location	Slope Stability Issue	Relevant Mitigation
Crossing of Pajaro River at UPRR	Moderately steep river banks and moderately dense vegetation – potentially unstable slope	Conduct a hydraulic and scour analysis to ensure that pipelines are installed at an adequate depth to prevent scour.
Crossing of Pajaro River at UPRR crossing	Steep southwest bank – potentially unstable slope	Use bore-and-jack techniques under UPRR and open-cut installation across river channel.
Sargent Hills	Unstable slope	Bank erosion and channel stability evaluation – install pipeline within existing railroad or road rights-of-ways that have been graded to a stable configuration.
Within Cayetano Hills	Moderately steep slopes, weak sedimentary rocks – potentially unstable slope	Bank erosion and channel stability evaluation

Portions of the proposed alignment traverse the Sargent Hills in the foothills of the Santa Cruz Mountains, an area that is landslide prone. Between approximately Stations 404+00 and 420+00, where the alignment traverses open country within the Cayetano Hills, slopes are moderately steep and consist of weak sedimentary rocks where slope stability would be a consideration during construction.

Pipeline construction could be affected by unstable slopes in these areas. In addition, post-construction slope failure triggered by earthquakes or channel erosion during flooding could damage the pipeline in the future. However, slope failure is not expected to result in catastrophic damage to the pipeline.

Integrated Coastal Distribution System

Much of the ICDS would be constructed in farm roads traversing the floor of the Pajaro Valley. Portions of the ICDS in Monterey County are in the vicinity of the Bolsa de San Cayetano. In that area, pipelines could be affected by unstable slopes.

Water Recycling Project

There are no slope stability issues concerning the WRP.

SURFACE FAULT RUPTURE HAZARDS

Import Water Project

Portions of the proposed pipeline alignment cross the active San Andreas and Sargent faults (see **Table 4.3.2** and **Map A1** in the Map Appendix). The Earthquake Hazard Zone for the Sargent fault is about 1,000 feet wide in the vicinity of the pipeline alignment. The alignment crosses the mapped fault trace at about Station 1552+00.

TABLE 4.3.2
LOCATIONS OF FAULT CROSSINGS

Approximate Pipeline Location (Station)	Fault Name
1552+00	Sargent
1065+00 to 1075+00	San Andreas
1102+00 to 1112+00	San Andreas

The Earthquake Hazard Zone for the San Andreas fault is about 3,000 feet wide in the vicinity of the proposed pipeline alignment. The alignment follows the mapped trace of the fault in two places: from about Stations 1065+00 to 1075+00 and at about Stations 1102+00 to 1112+00 (see **Maps A2 and A3** in the Map Appendix).

Surface fault rupture associated with seismic activity on these faults could result in pipeline damage. During the 1906 earthquake, horizontal movement of about four to five feet occurred in the southern Santa Cruz Mountains and railroad alignments at the Graniterock Company quarry shifted approximately 16 feet (PVWMA, 1997). A large earthquake on the San Andreas fault could result in significant surface fault rupture and pipeline damage. Pipeline rupture would result in the release of water and could cause substantial erosion at the discharge point. In addition, pipeline rupture and washout would probably damage nearby roadways, including SR 129, a major link to U.S. 101. The proposed action includes installation of isolation valves on both sides of the San Andreas Fault Zone and Sargent fault to isolate water flow in the event of pipeline damage.

Integrated Coastal Distribution System

The ICDS pipeline alignments do not cross any active faults.

Water Recycling Project

The WRP facility sites are not subject to fault rupture.

LIQUEFACTION HAZARDS

Import Water Project

Pipeline installation in areas underlain by clean, granular soil where shallow groundwater is present would be vulnerable to liquefaction. Relatively thick Quaternary alluvial deposits in the southern Santa Clara Valley in the vicinity of the proposed pipeline would be susceptible to ground failure by liquefaction (see **Maps A1** through **A4** in the Map Appendix). Most of the proposed alignment located in the Pajaro Valley is within a high or very high seismic hazard zone designated by the North County Area Plan (County of Monterey, 1994). However, actual liquefaction hazards can only be determined through a site-specific geologic investigation.

Liquefaction can cause pipes to bend, crack and/or rupture and may disrupt the alignment of pipes. Pipeline installed in low-lying areas could be subject to liquefaction during a large earthquake. Pipeline segments that traverse the Santa Cruz Mountain foothills are underlain by bedrock and are not at risk of liquefaction.

Integrated Coastal Distribution System

Segments of the ICDS installed at or near the Pajaro River and its tributaries could be subject to liquefaction hazards.

Water Recycling Project

The Water Recycling Facility site is adjacent to, and the pipeline crosses the Pajaro River and may be subject to liquefaction hazards.

STRONG GROUNDSHAKING HAZARDS

Import Water Project and Integrated Coastal Distribution System

Construction of the Import Pipeline and ICDS would occur in a region of high seismic activity, and thus the pipelines would be subject to strong ground shaking that could damage facilities. However, since the surface water supply is for agricultural use and not municipal use, loss of service would not jeopardize public health by adversely affecting drinking water supply, firefighting capabilities or other emergency response.

The majority of the Import Pipeline and ICDS alignments are expected to experience ground shaking of Modified Mercalli IX or greater (see **Table 3.3.2** in Chapter 3) as a result of a large earthquake on the San Andreas fault. The crossing of the Pajaro River, an area for which liquefaction is all but certain, is likely to result in damage to the pipeline. Groundshaking and liquefaction could cause loosening of pipeline joints resulting in leaks and possibly also breaking of a pipeline. The most severe impacts of this type would result from liquefaction of the soil, which could induce both vertical and lateral displacement of the soil that would bend, weaken and break pipelines. Broken pipelines could result in soil wash-out and sinkholes.

Water Recycling Project

Intense groundshaking and high ground acceleration would affect the entire area of the WWTF. The primary and secondary effects of groundshaking could damage structural foundations, distort pipelines and other water conveyance structures, and cause failure of concrete. Damage to these features would cause temporary service disruption and possibly loss of water due to leakage and pipe rupture. Pumps could be rendered inoperable. The most severe impacts of this type would result from liquefaction of the soil.

SOIL SETTLEMENT, EXPANSION AND CORROSIVITY

Import Water Project and Integrated Coastal Distribution System

Settlement, caused by consolidation of saturated, fine-grained, subsurface soils, could occur along the proposed Import Pipeline and ICDS alignments. **Table 4.3.3** lists areas of high shrink/swell potential for the Import Pipeline alignment. The ICDS alignment is located in the Pajaro floodplain, and passes through areas of Clear Lake clay soils that are subject to settlement and expansion. The pipelines could be damaged by differential settlement due to consolidation. The magnitude of the potential settlement cannot be estimated without subsurface exploration and laboratory testing. Plastic, potentially expansive soils with a high shrink-swell potential occur throughout the project area, as shown below. Expansive soils could cause pipeline damage. The proposed action includes a commitment to conformance with requirements for placement of buried pipelines in trenches with engineered soils that would reduce or eliminate the hazards for the most part. In the long term, settlement of the pipeline is an anticipated effect and design requirements will be established to allow settlement within acceptable levels.

TABLE 4.3.3
AREAS ALONG THE IMPORT PIPELINE SUBJECT TO SETTLEMENT AND EXPANSIVE SOILS

Approximate Import Pipeline Location (Station)	Shrink/swell potential	Approximate Import Pipeline Location (Station)	Shrink/swell potential
10+00 to 125+00	moderate	1145+00 to 1185+00	high-moderate
125+00 to 165+00	High	1197+00 to 1272+00	moderate
430+00 to 447+00	High	1272+00 to 1275+00	high
460+00 to 1035+00	moderate	1275+00 to 1505+00	moderate
1090+00 to 1120+00	moderate	1505+00 to 1680+00	high
1125+00 to 1130+00	moderate	1700+00 to 1820+00	high

SOURCE: USDA Natural Resources Conservation Service (formerly the Soil Conservation Service): *San Benito County (1969), Eastern Santa Clara County (1974), Santa Cruz County (1980), Monterey County (1978)*

Portions of the Import Pipeline alignment are underlain by a variety of soil types that are also highly corrosive to uncoated steel; potential areas with high corrosive soils are summarized in **Table 4.3.4**. These soils are distributed throughout the project area and include the Willows, Clear Lake clay, Cropley, Aptos, Los Osos, San Emigdio, Conejo, Salina, and Pacheco. Sections of the ICDS alignment that pass through areas of Clear Lake, Pacheco, and Elkhorn soils would also be potentially subject to corrosive conditions. Corrosive conditions can rapidly deteriorate ordinary concrete and uncoated steel. Corrosion of buried water facilities could result in system leakage, equipment failure and the need for excavation and maintenance.

TABLE 4.3.4
LOCATIONS OF SOILS ALONG THE IMPORT PIPELINE WITH HIGH CORROSIVITY

10+00 to 210+00	430+00 to 460+00	1587+00 to 1580+00
243+00 to 260+00	1090+00 to 1120+00	1640+00 to 1660+00
Murphy crossing	1125+00 to 1197+00	1700+00 to 1820+00
275+00 to 399+00	1272+00 to 1275+00	

SOURCE: USDA Natural Resources Conservation Service (formerly the Soil Conservation Service): *San Benito County (1969), Eastern Santa Clara County (1974), Santa Cruz County (1980), Monterey County (1978)*

Water Recycling Project

The soil at the WRF and along the pipeline route are fluvaquentic Haploxerolls-Aquic Xerofluvents soils on 0 to 15 percent slopes, and San Emigdio Variant sandy loam on 0 to 2 percent slopes (USDA, 1980). These are generally highly productive soils and almost entirely under cultivation. Each soil type in the project area possesses characteristics that could limit development of building structures or other facilities. These limitations include the shrink-swell capability (expansive behavior) and corrosivity.

TEMPORARY INCREASE IN SOIL EROSION

Import Water Project

Slope gradients along the majority of the proposed alignment (about 80 percent) are less than 5 percent. One exception is the portion of the pipeline alignment that traverses the Sargent Hills, where slopes in some areas approach 30 percent. Water erosion hazards for undisturbed soils are low in flat-lying agricultural settings to severe in some sloped areas or in Zamora and Cropley soils in Santa Clara County. However, the operation of construction equipment and vehicles, trench excavation, and soil stockpiling would expose loose soils to erosion if construction occurs in the rainy season. Soils exposed by construction operations have a tendency to be dislodged and transported by rain, surface watering, or temporary construction discharges. Soil erosion and loss of topsoil during a large construction project that extends over several months can be significant and result in project delays due to required soil restabilization, regrading, and soil removal from drainage structures.

Integrated Coastal Distribution System

Portions of the ICDS would be located in areas with soils having low erosion hazard. Potentially moderate to high erosion hazards are present along all pipeline alignments in the uplands where sandy soils are subject to rapid erosion, particularly in Baywood and Elkhorn soils. These areas already are extensively cultivated and normal farming practices already produce substantial areas of exposed soils each year. Thus, erosion caused by construction under the proposed action would add only a small amount incrementally to overall erosion and sediment generation of the wider area. However, the project has the potential to disrupt erosion control measures put in place by the growers. Additionally, erosion hazards are particularly high on steeper slopes; therefore, areas along the edges of the terraces are currently covered with permanent vegetation are especially susceptible to erosion if the vegetation cover is removed. The operation of construction equipment and vehicles, trench excavation, and soil stockpiling would expose loose soils to erosion if construction occurs in the rainy season. Some of the dune soils also would be subject to blowing.

Water Recycling Project

The WRF and pipelines would be in areas with soils having low erosion hazard. However, the operation of construction equipment and vehicles, trench excavation, and soil stockpiling would expose loose soils to erosion if construction occurs in the rainy season. Soils exposed by

construction operations have a tendency to be dislodged and transported by rain, surface watering, or temporary construction discharges. Soil erosion and loss of topsoil during a large construction project that extends over several months can be significant and result in project delays due to required soil restabilization, regrading, and soil removal from drainage structures.

DISTURBANCE OF CONTAMINATED SOILS OR GROUNDWATER DURING CONSTRUCTION

Import Water Project, Integrated Coastal Distribution System, and Water Recycling Project

Environmental Data Resources, Inc. conducted a search of federal, state, and local hazardous site databases in December 2001. **Table 4.3.5** presents the name of each database reviewed. The search identified sites that are permitted to generate hazardous wastes or store hazardous materials in underground or above ground storage tanks, or where soil or groundwater quality may have been degraded by hazardous substances.[1]

The database search identified four potential and confirmed hazardous waste sites within one-quarter mile of the Import Pipeline alignment. Two of the sites involved fuels (gasoline and diesel in 1990 and 1999), one was a release of a poison and etiologic (infectious) material from a residence in 1988, and one was an airborne release of a sealer at an orchard in 1989. In addition, the database review identified two solid waste handling facilities in the area (a green waste composting facility and the Lewis Road Landfill) as potential sources of contamination, and 19 other sites are reported to use hazardous materials.

Potential areas of concern near the ICDS include:

- Watsonville Landfill – potential groundwater impacts in area of planned pipeline near northern end of the planned pipeline in the Northern Plateau;
- Trafton Road – debris dumped along the bluff margin may contain unidentified environmental constituents;
- Railroad easement in the Santa Cruz Service Area, adjacent to Northeast Addition – potential unidentified soil and groundwater impacts associated with the rail line; and
- General pesticides and/or herbicides in the soil and groundwater associated with the long use of the surrounding land for agriculture.

[1] Sites permitted to handle hazardous wastes under the Resource Conservation and Recovery Act (RCRA) and sites with permitted underground storage tanks are known and approved to handle hazardous substances. The presence of these substances does not necessarily indicate that contamination of a site has occurred, just that the substances are present. Because the use of these substances is well regulated, site contamination is less likely to occur. As a part of permit requirements, these sites hold plans for hazardous materials management and safety. Potential and confirmed hazardous waste sites are sites where contamination is either suspected or confirmed by the regulatory agencies. The presence of hazardous substances in the soil and/or groundwater at or near a project location increases the potential to encounter hazardous substances during construction and potentially after development. The presence of hazardous substances may also require special construction and/or handling procedures of waste materials produced.

TABLE 4.3.5
SUMMARY OF DATABASES REVIEWED FOR IMPORT PIPELINE, WATER RECYCLING PROJECT AND ICDS

Name of List	Responsible Agency	Acronym
National Priorities List	USEPA	NPL
Comprehensive Environmental Response, Compensation and Liability Information System	USEPA	CERCLIS
Toxic Release Inventory System	USEPA	TRIS
Emergency Response Notification System. Records and stores information on reported releases of oil and hazardous substances.	USEPA	ERNS
RCRA Permitted Small Quantity Generator. Database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act.	USEPA	RCRA SQG
RCRA Permitted Large Quantity Generator	USEPA	RCRA LQG
RCRA Treatment, Storage, and Disposal Facilities	USEPA	RCRA TSD
RCRA Corrective Action Sites	USEPA	CORRACTS
Hazardous Materials Incident Report System. Contains hazardous material spill incidents reported to the Dept. of Transportation.	USEPA	HMIRS
Facility Index System. Contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA.	USEPA / NTIS	FINDS
HAZNET. CA Sites listed on hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually.	DTSC	HAZNET
California Hazardous Material Incident Report System. Contains information on reported hazardous material incidents, i.e., accidental releases or spills.	CA Office of Emergency Services	CHMIRS
Hazardous Waste Substance Site List. Identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release and all solid waste disposal facilities from which there is known migration.	Governor's Office of Planning & Research	CORTESE
Mines Master Index File.	DSMS	Mines
Leaking Underground Storage Tanks. Incident Reports contain an inventory of reported leaking underground storage tank incidents.	SWRCB	LUST

TABLE 4.3.5 (Continued)
SUMMARY OF DATABASES REVIEWED FOR
IMPORT PIPELINE, WATER RECYCLING PROJECT AND ICDS

Name of List	Responsible Agency	Acronym
Underground Storage Tank Database. Contains registered USTs. USTs are regulated under Subtitle I of the RCRA.	SWRCB	UST
Historical UST Registered Database	SWRCB	HIST UST
Notify 65. Records contain facility notifications about any release that could impact drinking water and thereby expose the public to a potential health risk.	SWRCB	NOTIFY 65
Aboveground Storage Tank Database	SWRCB	AST
Facility Inventory Database. Contains active and inactive underground storage tank locations.	SWRCB	CA FID
DRYCLEANERS. A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaners' agents; linen supply; coin-operated laundries and cleaning; dry-cleaning plants except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.	RWQCB	CLEANERS
Waste Management Unit Discharge Systems	RWQCB	WMUDS
Spill, Leak, Investigation and Cleanup List	RWQCB	SLIC

* CA Department of Labor, Mine Safety & Health Admin.

SOURCE: Environmental Data Resources, Inc., 2001b.

No potential hazardous waste generators or release sites were found within the vicinity of the Water Recycling Facility and pipeline; however, sites were found within the vicinity of the supplemental wells siting area. These sites included seven LUST sites, one fuel spill, the Watsonville City Landfill site, and a sanitary landfill site.

The potential exists for contaminated soil or groundwater from these sites to be encountered during excavation activities. In addition, the project could encounter areas of unknown contaminated soil or groundwater, where incidents have not been reported. No specific sites have been selected yet for the supplemental wells; PVWMA will avoid areas of known contamination when selecting well sites and connecting pipelines.

If encountered, contaminated materials may be classified as a hazardous waste, a designated waste, or a special waste, depending on the type and degree of contamination. Disposal of contaminated soils as standard demolition waste or use as fill for another construction site could pose a hazard to people, or animal or plant populations.

ACCIDENTAL SPILLS OF DIESEL FUEL OR OTHER HAZARDOUS MATERIALS

Import Water Project and Integrated Coastal Distribution System

Construction activities would require the use of certain potentially hazardous materials such as fuels, oils, solvents, lead solder, and glues. These materials would generally be used for excavation equipment, generators, and other construction equipment and would be contained within vessels engineered for safe storage. Due to the rate of construction, storage of significant quantities of these materials at the construction site is not anticipated. Rather, tender vehicles would most likely provide fuel and lubricant to construction equipment on a daily basis and would be mobilized from an off-site location. Spills during onsite fueling of equipment or an upset condition (i.e., puncture of a fuel tank through operator error or slope instability), could result in a release of fuel or oils into the environment, including sensitive waterways along the project alignment.

Water Recycling Project

Potential impacts associated with the use of hazardous materials during construction would be the same as discussed above for the Import Water Project and Integrated Coastal Distribution System. In addition, operation of the WRF would involve transport, use, and storage of hazardous materials. Proposed water recycling facilities would use conventional filtration (i.e. coagulation/flocculation/ sedimentation followed by either granular media filtration or cloth media filtration). Aluminum sulfate and an anionic polymer would be used for the coagulation/flocculation process. The method of disinfection could be either UV disinfection or disinfection with sodium hypochlorite. UV radiation would not require chemicals. If chlorine is used as disinfection, sodium hypochlorite would be stored and used on-site. Sodium hypochlorite is a standard chemical used in the treatment of effluent. While direct contact with aluminum sulfate, anionic polymer, or sodium hypochlorite can result in the severe irritation of skin and eyes, and inhalation of vapors is to be avoided, these substances are not classified as acutely hazardous materials. All chemicals would be stored within chemical containment areas. Chemicals would be stored in aboveground storage tanks.

Routine operations at the WRF produce small amounts of hazardous wastes, primarily waste chemical from laboratory tests and spent cleaning solvents. These wastes are handled and disposed according to state and local regulations. Hazardous wastes generated at the plant are logged with an EPA waste generator number and transported away by a licensed waste hauler.

The City of Watsonville has in place emergency response procedures that are included as part of their Hazardous Materials Business Plan (as required by CCR Title 6.95, Section 25500) and Spill Control and Countermeasure Plan (as required by CFR, Title 40, Section 112.7). These plans would be updated to reflect the hazardous substances used at the proposed WRF as part of the proposed action. Implementation of measures identified in earlier in this section would reduce potential for chemical storage to be affected by geologic hazards (e.g., ground shaking and slope stability).

In total, approximately 26 chemical truck deliveries are expected per month for the WRF (see **Table 4.3.6**). Trucking on highways and local streets is the most common method of transporting hazardous materials and waste in the project area. The Santa Cruz County Hazardous Waste Management Plan contains policies regarding transportation of hazardous materials and wastes, including emergency response.

TABLE 4.3.6
EXISTING AND PROPOSED CHEMICAL USE AT THE WATSONVILLE WASTEWATER TREATMENT FACILITIES

Chemical Name	Chemical Use	Deliveries	
		Amount	Frequency
Existing - Secondary Treatment @ 7.4 mgd, Average Influent Flow in 2001			
Sodium hypochlorite (NaOCl)	471.1 gal/day	5,000 gal/load	3 loads/month
Ferric chloride ($FeCl_3 \cdot H_2O$)	163.0 gal/day	45,000 lb/load	1.33 loads/month
Sodium bisulfite ($NaHSO_3$)	75 gal/day	5,000 gal/load	0.45 load/month
Proposed - Tertiary Treatment @ 8 mgd, Design Flow			
Aluminum Sulfate[1]	500 gal/day	4,500 gal/load	3.33 loads/month
Anionic Polymer[2]	30 lbs/day	50 lbs/load	18 loads/month
Sodium hypochlorite[3] (NaOCl)	800 gal/day	5,000 gal/load	5 loads/month

1 Other types of coagulant, such as ferric chloride, polyaluminum chloride, aluminum chlorohydrate, might be selected during design, construction or operation phase
2 Other types/forms of polymer might be selected during design, construction or operation phase
3 Assuming that the disinfection process uses sodium hypochlorite

SOURCE: RMC, Inc., 2002.

An accident involving hazardous materials during vehicle transport could result in the following impacts:

- Direct exposure of motorists and emergency responders (i.e., firefighters, highway patrol officers, paramedics, Caltrans workers, etc.) to hazardous materials, resulting in acute and chronic health effects.
- Contamination of the roadway and surrounding environment due to uncontrolled runoff from the incident.

Because of the stringent hazardous material packaging and transportation requirements and the low accident rate involving hazardous materials, an accident is not probable, and this impact is considered less than significant.

4.3.3 ALTERNATIVE C – IMPORT WATER PROJECT ONLY

DAMAGE FROM UNSTABLE SLOPES AND SLOPE FAILURE

Import Water Project and Integrated Coastal Distribution System

This impact would be the same as under Alternative B, above.

SURFACE FAULT RUPTURE HAZARDS

Import Water Project and Integrated Coastal Distribution System

This impact would be the same as those described under Alternative B, above.

LIQUEFACTION HAZARDS

Import Water Project and Integrated Coastal Distribution System

This impact would be the same as those described under Alternative B, above.

STRONG GROUNDSHAKING HAZARDS

Import Water Project and Integrated Coastal Distribution System

This impact would be the same as those described under Alternative B, above.

SOIL SETTLEMENT, EXPANSION AND CORROSIVITY

Import Water Project and Integrated Coastal Distribution System

This impact would be the same as those described under Alternative B, above.

TEMPORARY INCREASE IN SOIL EROSION

Import Water Project and Integrated Coastal Distribution System

This impact would be the same as those described under Alternative B, above.

DISTURBANCE OF EXISTING CONTAMINATED SOILS OR GROUNDWATER DURING CONSTRUCTION

Import Water Project and Integrated Coastal Distribution System

This impact would be the same as those described under Alternative B, above. The injection/extraction wells would be sited within 1,000 feet of the Import Pipeline alignment. The study area for the database search extended one-quarter mile on each side of the Import Pipeline

alignment and therefore includes the injection/extraction wells siting area. The injection/extraction wells would be precluded from development within contaminated sites.

ACCIDENTAL SPILLS OF DIESEL FUEL OR OTHER HAZARDOUS MATERIALS

Import Water Project and Integrated Coastal Distribution System

This impact would be the same as those described under Alternative B, except that there would be no increase in the transport and use of hazardous materials associated with water recycling.

4.3.4 CUMULATIVE IMPACTS

Section 4.11 of this Draft EIS evaluates cumulative impacts. Implementation of Alternative B or C, in conjunction with CVP contract assignments to PVWMA, could contribute to cumulative changes in agricultural practices and land use in the San Joaquin Valley. Changes in agricultural practices (e.g, a shift to grazing from crops traditionally cultivated in the San Joaquin Valley) could contribute to soil erosion and compaction, which could be controlled through Best Management Practices. However, the changes are primarily occurring due to economic and environmental conditions. These changes often result in the need for less CVP water on those lands, resulting in requests for water service transactions. Under the No Action Alternative, those conditions will continue. Agricultural practices and land uses in the San Joaquin Valley would not change significantly with implementation of either Alternative B or Alternative C. Within the PVWMA service area, other planned projects, in combination with Alternative B or C, could result in short-term cumulative erosion hazards. Implementation of erosion and sedimentation control measures (specified in Tables D.1, D.2, and D.3 of Appendix D) would reduce the project's contribution to this cumulative impact.

4.4 WATER RESOURCES AND WATER QUALITY

METHODOLOGY

Computer modeling is often used to evaluate surface water and groundwater response in a basin affected by an altered hydrologic system. Modeling provides the analyst an opportunity to estimate hydrologic response, based on historic hydrologic data, for a defined set of assumptions and predicted scenarios. Analysis of potential environmental consequences of the No Action Alternative and Alternatives B and C incorporated output of the Pajaro Valley Integrated Groundwater and Surface Water Model (PVIGSM). The PVIGSM provides data to evaluate the surface water and groundwater impacts resulting from the alternatives, in combination with other existing and proposed actions affecting these water resources. The following impact analysis and discussion presents an overview of the computer modeling, the assumptions, and the simulation cases used to formulate the future No Action Alternative. Results of the analysis form the basis of the impacts and mitigation discussion.

HYDROLOGIC COMPUTER MODEL

PVIGSM is a comprehensive hydrologic model of the Pajaro Valley and incorporates an extensive database, including information on geologic conditions, current and historical hydrologic conditions, and land and water use within the Pajaro Valley. PVIGSM was developed as a basin planning tool to analyze various groundwater and surface water management scenarios. PVIGSM incorporates the primary components of the hydrologic system, including groundwater levels and groundwater movement, seawater intrusion, streamflows, and recharge from stream seepage and soil percolation. It is not possible to predict future hydrologic conditions. However, by analyzing the actual long-term historical record of water year types, it is possible to predict the effects of the No Action Alternative and how the basin would respond to various hydrologic scenarios. The model was originally developed in 1990 and was updated in 1993 and again in 1997 as part of the Revised BMP effort.

SIMULATION PERIOD

A long-term hydrologic period that contains a sequence of various rainfall conditions was required to provide a reasonable basis for evaluating the state of the basin during both drought and wet conditions. The 34-year hydrologic period (1964 to 1997) used during model calibration contains a distribution of normal, above-normal, and below-normal water year conditions. Streamflow conditions for this simulation period are represented by historical records from 1964 to 1997, which include various sequences of hydrologic events ranging from flood to extended periods of drought. This period covers a range of hydrologic conditions, including a prolonged drought (1987 to 1992), a short-term drought (1976 to 1977), and periods of above-normal precipitation (1967 to 1971, 1982 to 1983, and 1985 to 1986). Although the model period of record extends from 1964 to 1997, PVMWA is able to extrapolate the model results to provide estimates of water use for years 1998, 1999, and 2000. These extrapolations assume the same

cropping, land use, and cultural practices (i.e., irrigation efficiencies and crop rotations) as used in 1997 (RMC, Inc., 2002).[1]

In order to allow enough time for the PVIGSM simulation model to adjust to changes in the water supply scenarios, the 1964 to 1967 monthly hydrologic cycle is repeated to develop a historical 68-year hydrologic record. The 68-year simulation period was used to represent varied hydrologic conditions in the basin. Hence, the historical hydrologic period is considered to be representative of future hydrologic conditions.

PAJARO VALLEY WATER YEAR HYDROLOGIC CLASSIFICATION

Each year within the 68-year hydrologic sequence used in PVIGSM corresponds to a particular hydrologic water year type. The water year types include: below normal, normal, and above normal. These water year types were defined for the purpose of this study, since no official water year classifications have been defined by the State Water Resources Control Board (SWRCB) for the Central Coast hydrologic basins. Within the 68-year hydrologic sequence, 10 years (15 percent) are classified as below normal, 46 years (67 percent) are classified as normal, and 12 years (18 percent) are classified as above normal.

MODELING ASSUMPTIONS

Land Use and Agricultural Crop Mix

The land use and corresponding crop mix acreage data in the PVIGSM are used to estimate the agricultural crop water requirements and the groundwater pumping and surface water supplies necessary to meet these requirements. The land use distribution data also are used to define the geographic distribution of rainfall runoff and irrigation applied water. The latter affects the distribution of infiltration and deep percolation of water into the groundwater system.

Land use in the model area is divided into three major categories: agricultural, urban, and native vegetation. The land use distribution for the Baseline Conditions is assumed to be that for the 1997 land use survey conducted by the California Department of Water Resources (DWR). Of the total land area of approximately 96,500 acres within the Pajaro Valley model area, approximately 36 percent (34,650 acres) is assumed to be used for agricultural purposes, 13 percent (12,860 acres) for urban and suburban, and the remaining 51 percent (48,996 acres) is native vegetation and undeveloped land. The total modeled area is approximately 146,700 acres of which approximately 96,500 acres are onshore lands (the balance extends into Monterey Bay). The model boundary follows hydrogeologic boundaries. The PVWMA service area is approximately 79,600 acres and generally lies within the onshore area of the model, with the exception of the PVWMA's eastern boundary. Refer also to Figure 2.1 in the Revised BMP.

[1] Integrated groundwater and surface water models, such as the PVIGSM, are typically calibrated to a period of hydrologic record that is considered representative of long-term regional hydrology. Most hydrologic records used in models span a period of about 20 to 70 years. Models periodically can be recalibrated to include recent hydrologic data when it becomes available, but it is not a standard practice to recalibrate basinwide models following each water year.

The agricultural crop mix affects the assumptions for evapotranspiration, irrigation efficiencies, and agricultural water use. The crop acreage under conditions considered as the Baseline Conditions is assumed to be the same as that in the 1997 land use survey. The largest crop acreage is vegetable row crops, followed by strawberries and deciduous trees (see **Figure 4.4-1**). Field crops, vineyards, pastures, and nurseries constitute between two and five percent of the agricultural acreage.

4.4.1 ALTERNATIVE A – NO ACTION

SIMULATION CASES – FUTURE WATER USE UNDER THE NO ACTION ALTERNATIVE

On the basis of the assumed land use, agricultural crop mix, and water supply conditions, project engineers used the PVIGSIM model to simulate surface water and groundwater conditions. The simulation cases developed for the model include Baseline Conditions for 2000 and 2040, and Basinwide Pumping Restrictions:[2]

- *Baseline Conditions*. The Baseline Conditions cases (for 2000 and 2040) allow comparison of current conditions and conditions in 2040 with no pumping reductions to the Basinwide Pumping Restrictions scenario. The Baseline Conditions 2000 case represents current conditions in the groundwater basin and assumes that average annual groundwater pumping is approximately 69,400 afy. In the Baseline Conditions 2040 case, it is assumed that the existing water demand and supply mix (based on 1997 data) will remain unchanged between 2000 and 2040, and all of the PVWMA's water supply will continue to be supplied from local groundwater by pumping. Average annual groundwater pumping in 2040 would be approximately 78,400 afy.

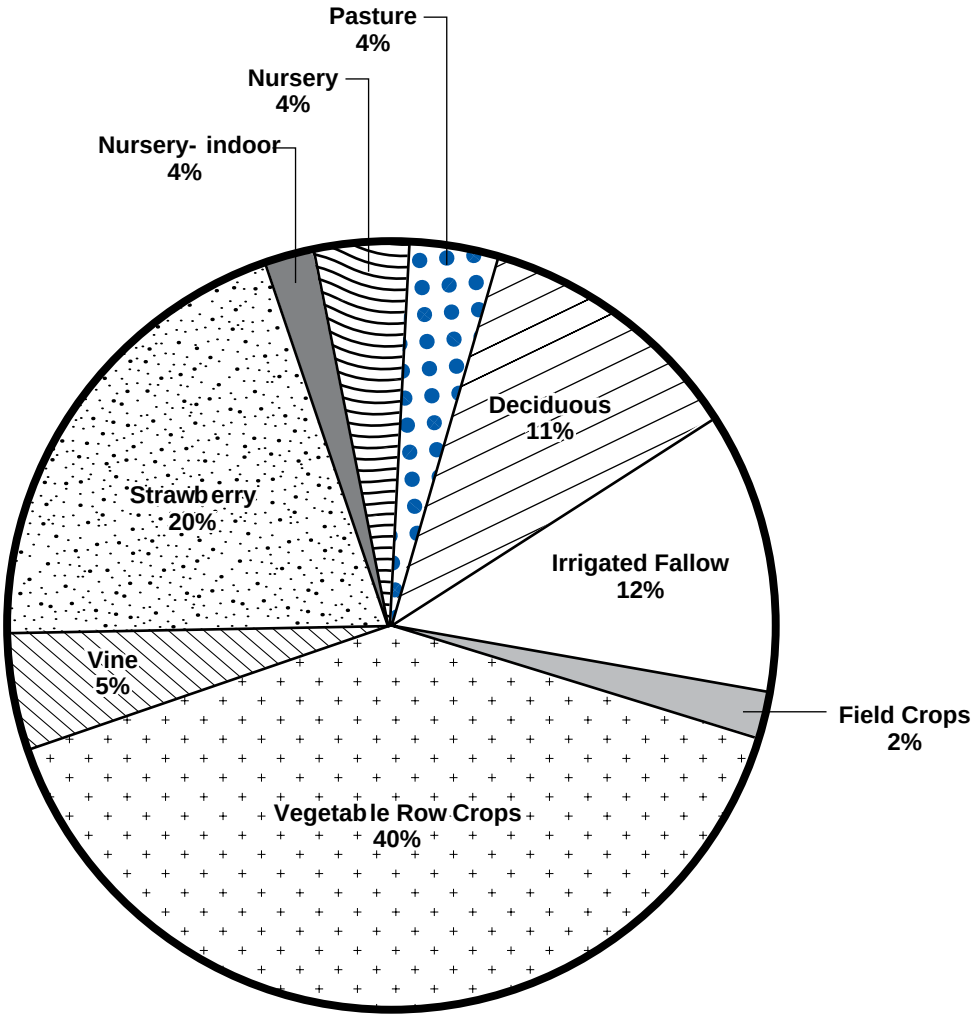
- *Basinwide Pumping Restrictions*. Under this scenario, the pumping restrictions would be imposed uniformly throughout the basin. In order to stop seawater intrusion, basinwide pumping would be reduced from 69,000 afy to 24,000 afy.

EFFECTS ON THE RATE OF SEAWATER INTRUSION

Baseline Conditions

The Baseline Conditions (2000 and 2040) cases represent the base case for comparison with the project to determine the long-term groundwater impacts of the No Action Alternative scenario with current conditions and 2040 conditions (with no groundwater pumping reductions). Under the Baseline Conditions 2000 and 2040 scenarios, PVWMA would not implement any groundwater pumping restrictions or develop additional water supplies. Groundwater pumping under the Baseline Conditions 2000 case represents the current groundwater pumping rate throughout the Pajaro groundwater basin.

[2] A simulation of reducing pumping just in the coastal area also was developed.



NOTE: Reflects modeled groundwater basin area, which is greater than PVWMA service area.

SOURCE: Draft Revised Basin Management Plan, 2001

Figure 4.4-1
Agricultural Crop Mix

The Baseline Conditions 2040 case assumes that existing urban areas will increase in density between 2000 and 2040, and urban growth outside of existing urban areas will only occur in lands currently designated as native vegetation, consistent with historic patterns of urban development in the Valley. It is further assumed that no additional land will be brought into agricultural production. Using these assumptions, groundwater pumping in the Baseline Conditions 2040 case is estimated to be 78,400 afy. (It should be noted that this scenario is included for informational purposes; under the Basinwide Pumping Restrictions scenario, no growth in urban development is assumed to occur or demand from any new development would not increase groundwater pumping because of mandatory conservation measures.)

The results of the model indicate that under the Baseline Conditions 2000 case, seawater intrusion would continue to occur at a rate of 13,490 afy. Seawater intrusion would occur in the Baseline Conditions – 2040 case at a rate of 14,690 afy (see **Table 4.4.1**).

TABLE 4.4.1
ESTIMATED SEAWATER INTRUSION RATES

Model Scenario	Average Annual Seawater Intrusion (afy)[a]
Baseline Conditions - 2000	13,490
Baseline Conditions - 2040	14,690
No Action Alternative A – Basinwide Pumping Restrictions for 2000 Conditions	0
No Action Alternative A - Basinwide Pumping Restrictions for 2040 Conditions	0
Alternative B (Water Recycling Project and Import Water Project)	0
Alternative C (Import Water Project only)	0

[a] Intrusion rates are estimates based on modeling results.

SOURCE: Water Resources & Information Management Engineering, Inc., September 2002

Basinwide Pumping Restrictions

In this scenario, groundwater pumping would be reduced uniformly throughout the basin by 45,000 afy (using Baseline Conditions in 2000), to an average pumping rate of 24,000 afy. For the 2040 Baseline Condition, basinwide pumping would be reduced by 33,320 afy to 45,080 afy. As shown in **Table 4.4.1**, this scenario (using both 2000 and 2040 conditions) would essentially eliminate seawater intrusion, unlike the Baseline Conditions cases.

4.4.2 ALTERNATIVE B – WATER RECYCLING PROJECT AND IMPORT WATER PROJECT

SIMULATION CASES – FUTURE WATER USE SCENARIO UNDER ACTION ALTERNATIVES B AND C

On the basis of the assumed land use, agricultural crop mix, and water supply conditions described above, project engineers used the model to simulate surface water and groundwater conditions. The simulation cases developed for the model include Action Alternatives B and C as well as the Baseline Conditions for 2000 and 2040 described above.

- *Alternative B*. Alternative B would provide 17,400 afy, including 13,400 afy of imported water. Together with 1,100 afy supplied by the Harkins Slough project, this alternative would provide a total of 18,500 afy, the amount of supply required to serve agricultural uses in the coastal area while stopping seawater intrusion.

- *Alternative C*. Alternative C relies on construction of the Import Pipeline to meet the water supply needs of the Pajaro Valley. Like Alternative B, this alternative assumes PVWMA will import Central Valley Project (CVP) water or water from another source outside the Pajaro Valley. No recycled water is included in this alternative; 17,400 afy would be imported via the Import Pipeline. Together with 1,100 afy supplied by the Harkins Slough project, this alternative also would provide a total of 18,500 afy.

The modeling results for the Alternative B scenario are presented below. Modeling results for the Alternative C scenario are presented in Section 4.4.3.

EFFECTS ON RATE OF SEAWATER INTRUSION

Alternative B would provide 17,400 afy to replace groundwater currently pumped from the groundwater basin for agricultural use in the coastal area. As shown in **Table 4.4.1**, by eliminating groundwater pumping in the coastal area and providing a replacement water supply to irrigate coastal agricultural lands, Alternative B would eliminate seawater intrusion. Seawater intrusion rates would be less because some of the imported water used to irrigate coastal agricultural lands would percolate down into the groundwater aquifer, forming a freshwater barrier. Seawater intrusion would be substantially less than the Baseline Conditions cases.

INCREASED SOIL EROSION AND TRANSPORT OF CONTAMINANTS TO DOWNSTREAM RECEIVING WATERS

Import Water Project, Integrated Coastal Distribution System, Water Recycling Project

Pipeline construction would primarily employ open-trench methods. Excavated spoils would be stockpiled along the trenches, then utilized for backfill, and excess or unsuitable materials would be transported from the alignments, as necessary. County permit requirements state that no excavated materials would be sidecast. Construction of proposed facilities for the Water

Recycling Project would involve earthmoving activities such as excavation, grading, and soil stockpiling. Construction activities would include implementation of BMPs for erosion control.

Potential impacts associated with construction could include sedimentation of the channels outside of the construction area during trenching, excavation and grading, with subsequent downstream water quality impacts such as increased turbidity and sediment deposition. Additionally, hazardous materials associated with construction activities, such as fuels, oils, antifreeze, coolants, paints, solvents, and/or other chemicals could be spilled or discarded and ultimately seep or leak into waterways draining the project site.

Pipeline trench construction across the Pajaro River and its tributaries would require a Section 404 permit from the U.S. Army Corps of Engineers, and 1601/03 Streambed Alteration Agreement from the California Department of Fish and Game (CDFG). A 401 Water Quality Certification from the RWQCB would also be required. The proposed action would likely be authorized under a Corps of Engineers Section 404 Nationwide 12 – Utility Line Discharges permit. This permit authorizes utility pipeline installation across "waters of the U.S." in compliance with permit requirements. This Nationwide Permit authorizes mechanized land clearing necessary for the installation of utility lines, provided the cleared area is kept to the minimum necessary and preconstruction contours are maintained. Installation would occur during the dry season or low-flow season and would comply with permit requirements; therefore, potential impacts to water quality would be reduced to a less-than-significant level. This is discussed in further detail in Section 4.5, Vegetation, Fish, and Wildlife.

EXPOSURE OF STRUCTURES TO FLOOD HAZARDS

Import Water Project, Integrated Coastal Distribution System

The Import Pipeline would be constructed within the FEMA 100-year flood hazard zone for the Pajaro River, and the ICDS would be constructed within the FEMA 100-year flood hazard zone for the Pajaro River, Watsonville Slough, Bennett Slough, and Elkhorn Slough. Following construction, no project facilities would be above ground. Construction activities, however, will require construction equipment, materials stockpiles, and stockpiles of soils above ground that could locally change flood conditions. The construction activities would be temporary, and the impact would be less than significant.

Water Recycling Project

The WRF site adjacent to the WWTF site and the associated pipelines are within FEMA's 100-year flood hazard zone for the Pajaro River; as such, floodproofing of the facilities would be required. Placing the facilities within the 100-year floodplain would not be expected to exacerbate downstream flood conditions because of the proximity of the site to the ocean.

EFFECTS ON WATER QUALITY AND CROP YIELDS FROM USE OF RECYCLED WATER

Water Recycling Project

Irrigation with recycled water could contribute to loading of specific constituents to groundwater supplies in the vicinity of irrigation sites. Typical groundwater quality concerns regarding the use of recycled water include TDS, metals, microorganisms, salts, and nitrates.

The proposed action would result in the irrigation of agricultural lands with a blend of recycled water and either groundwater or surface water, with the goal of limiting the TDS concentration to a maximum of 500 mg/L. The recycled water alone would have a TDS level of approximately 900 mg/L, and would be blended with either groundwater (2.7:1, assuming 350 TDS water) or imported water (2.7:1, assuming 350 TDS water) to achieve a blended TDS level of 500 mg/L. The target value of 500 mg/L was selected because it is considered the upper limit of suitability for irrigation of strawberries, which are the most salt-sensitive crop grown in the vicinity. Other crops grown in the area (in order of decreasing sensitivity to salinity) are lettuce, celery, cabbage, broccoli, and artichokes. Thus, irrigation with water containing a maximum of 500 mg/L would be considered protective of strawberry yields, and therefore would have no adverse effects on other crop yields. The TDS level in the recycled water mix would be below 500 mg/L, which is the secondary drinking water MCL; therefore, a less-than-significant impact to TDS levels in local groundwater is anticipated as a result of irrigating with the blended water. Monitoring of crop yields following initiation of recycled water irrigation is recommended.

Metals would not be expected to adversely affect groundwater quality, because all metals in the recycled water are expected to be below their respective drinking water MCLs (see **Table 3.4.5**). In addition, metals are removed from water in soils through a complex process of adsorption, precipitation, ion exchange, and complexation (U.S. EPA, 1981).

Microorganisms, including bacteria and viruses, are removed from water through filtration, adsorption (adherence to solids), desiccation (drying out of microorganisms), predation (loss of microorganisms to predators), and exposure to other adverse conditions. Bacteria, including coliform, are removed by filtration through the soil; in general, there is greater filtration of bacteria in fine-grained material than in course-grained material. Studies of wastewater application indicated that coliform are normally removed after five feet of percolation through the soil (U.S. EPA, 1981).

Nitrate would be present in the recycled water; the nitrate level in applied irrigation water (blended with either imported water or groundwater) would be lower than the value shown in **Table 3.4.4**. The drinking water MCL for nitrate (as nitrogen) is 10 mg/L. Nitrate is absorbed by plants and is readily immobilized in the unsaturated zone through absorption. However, once in the groundwater, nitrate is relatively stable and mobile. Typically, the levels of nitrate present in Watsonville's recycled water are less than the nitrate requirement of crops, and would be expected to be readily absorbed. Therefore, the potential for nitrate loading to affect groundwater quality within the area of irrigation is considered low. The potential for nitrate migration through the root zone of crops would be further reduced by avoiding the over-application of irrigation water.

The primary mechanism for reducing nitrate levels in groundwater is through dilution. Thus, assuming a small percentage of the applied nitrate were to migrate to groundwater, a measurable but relatively low increase in nitrate concentrations is predicted in local groundwater.

Extensive analyses of nitrate loading was conducted as part of the City of Santa Rosa's Subregional Long-Term Wastewater Project EIR/EIS (City of Santa Rosa, 1996). Nitrate levels were monitored by sampling monitoring wells located upgradient, midgradient (in the central portion of irrigated areas), and downgradient of areas irrigated with recycled water. That analysis indicated an overall decrease in nitrate levels in a downgradient direction. If irrigation with recycled water were a significant source of nitrate input to groundwater, the opposite trend would be expected. Possible explanations include the denitrification and off-gassing of nitrogen gas, or that upgradient land use practices provide a greater input of nitrate to groundwater than the land use practices associated with irrigation using recycled water. Thus, while these studies were somewhat inconclusive, they did indicate that irrigation with recycled water would not be expected to result in a significant increase in the nitrate levels in groundwater.

The over-application of recycled water would have the potential to affect surface water quality if it resulted in surface ponding or direct runoff to local creeks or other water bodies. State regulation requires that recycled water be applied according to the evapotranspiration requirements of the crop being irrigated, which would prohibit the over-application of recycled water (and subsequent ponding or surface runoff). Recycled water should also not be applied within 50 feet of creeks or wells (Article 60310, Water Code).

4.4.3 ALTERNATIVE C – IMPORT WATER PROJECT ONLY

EFFECTS ON RATE OF SEAWATER INTRUSION

Impacts would be the same as those described under Alternative B, above.

INCREASED SOIL EROSION AND TRANSPORT OF CONTAMINANTS TO DOWNSTREAM RECEIVING WATERS

Impacts would be the same as those described under Alternative B, above.

EXPOSURE OF STRUCTURES TO FLOOD HAZARDS

Impacts would be the same as those described under Alternative B, above.

EFFECTS ON GROUNDWATER FLOW REGIMES AND AQUIFERS DUE TO INJECTION/EXTRACTION WELLS

When water is injected under pressure into an aquifer, hyrogeologic effects such as "groundwater mounding" can occur as the underlying aquifer accommodates the additional water. Injection causes the localized mounding that allows for extraction of the additional groundwater from the same well when needed. Depending on the underlying geology, the mounding can increase

groundwater elevations, reduce pumping lifts, and alter the lateral and vertical underflow of groundwater by locally altering the groundwater flow gradients. Altered groundwater flow regimes attributable to mounding can reduce groundwater supply to users located within the injection/extraction area of influence. Increased groundwater levels due to mounding can also result in increased groundwater discharges to surface creeks.

Injection/extraction can reduce the water quality in an overlying, underlying, or adjacent aquifer by changing the migration pattern of low-quality groundwater and altering the vertical groundwater gradients. For example, head reduction due to extraction of groundwater could increase a vertical downward flow gradient, causing lower-quality groundwater to enter and degrade an underlying confined aquifer.

Pressures generated during injection can cause "hydrofracturing" of confining or water-bearing strata adjacent to the subject aquifer. Hydrofracturing could lead to loss of water from the confined aquifer and potential formation of springs and seeps at the surface. The pressures that cause hydrofracturing must exceed the overburden pressure at the depth of the affected aquitard unit (Fugro West, 1995). High levels of groundwater mounding resulting from injection of water are likely to cause hydrofracturing. At considerable depth, hydrofracturing may not cause noticeable surface effects; however, hydrofracturing becomes a concern when strata close to the surface are fractured, causing changes in the conductivity of shallow aquifers, surface seepage with possible flooding, and water to enter subterranean structures such as basements.

As with other programs implemented by PVWMA to extract groundwater, technical feasibility studies would be conducted prior to program implementation to address concerns such as groundwater well location, water conveyance, well spacing, and pumping rates. For instance, groundwater extraction from multiple wells would not be concentrated in a particular area if studies indicated that the resulting drawdown would lower groundwater levels below the minimum required pumping levels. Appropriate well siting would avoid placement of groundwater injection wells in concentrated areas, thus limiting drawdown that would decrease local groundwater levels. Similarly, groundwater injection tests would be conducted to assess appropriate injection pressures, extent of mounding, and potential for hydrofracturing.

WATER QUALITY EFFECTS RESULTING FROM INJECTION/EXTRACTION WELL DISCHARGES DURING WELL DEVELOPMENT, INITIAL WELL OPERATION, AND BACKWASHING

Injection/extraction wells require ongoing maintenance to remove excess sediment and well construction materials, clear the well casing screens, and to initiate flow through the sand and gravel filter packs that surround the well casing. Typically, several well volumes (amount of standing water in well) are pumped until the discharge is relatively free of sediment. Prior to conveying water from an extraction well into the pipeline, the initial flows are diverted to the ground surface to ensure that low sediment levels are entering the pipeline. Well development and standard maintenance backwashing can generate well discharges that typically are diverted to

the ground surface.[3] Water generated during the development, initial pumping, and backwashing can contain high sediment, high TDS, and elevated electrical conductivity and can vary in temperature. Discharge of this water can adversely affect the quality of the receiving surface water by altering its chemistry, adding sediment, or increasing TDS. Although the groundwater quality underlying the proposed well field is generally good, discharges from the injection/extraction well development and maintenance could contain high sediment levels and require sediment removal prior to surface discharge.

PVWMA has adopted a Mitigation Monitoring and Reporting Program for the Revised BMP EIR that includes obtaining the necessary NPDES permit from the RWQCB before any one of the aforementioned discharges could occur (see Table D.3 in Appendix D). The NPDES permit would establish specific parameters for discharge quantity and quality and would require regular monitoring through a Reporting and Monitoring Program implemented as part of the permit. Parameters set forth by the NPDES permit would ensure that proper sediment levels are achieve and maintained.

4.4.4 CUMULATIVE IMPACTS

Section 4.11 of this Draft EIS evaluates cumulative impacts. Implementation of Alternative B or C, in conjunction with CVP contract assignments to PVWMA, would result in changing water use patterns in the San Joaquin Valley, potentially resulting in beneficial or adverse effects on groundwater (refer to **Tables 4.11.2** and **4.11.3** in Section 4.11). However, the changes in water use patterns in the San Joaquin Valley are primarily occurring due to economic and environmental conditions. These changes often result in the need for less CVP water on those lands, resulting in requests for approval of water service transactions. Under the No Action Alternative, those conditions will continue. Within the PVWMA service area, other planned projects, in combination with Alternative B or C, could result in short-term cumulative sedimentation and construction-related contaminant accumulation and runoff. Best Management Practices such as revegetation and stabilization of construction areas would control and eliminate the sources of sedimentation and surface water contaminants. Implementation of the measures in **Appendix D** would reduce the project's contribution to cumulative construction impacts.

[3] Backwashing is the surging effect or reversal of water in a well. The backwashing procedure removes fine-grained material from the formation surrounding the borehole and, thus, can enhance well yield.

4.5 VEGETATION, FISH AND WILDLIFE

METHODOLOGY

Sources used in the preparation of this assessment include information gained from previous field surveys and records from the biological literature (e.g., Munz and Keck, 1970; Holland, 1986; Hickman, 1993; Swanson and Lyons, 1992; Skinner and Pavlik, 1994; Jennings and Hayes, 1994; NMFS, 1996) and the California Department of Fish and Game (CDFG) California Natural Diversity Data Base (CNDDB, 2002). CNDDB reports occurrences of special status species using U.S. Geological Survey (USGS) 7.5-minute topographic map quadrangles. The area potentially affected by this project is located on parts of five USGS 7.5-minute quadrangles: San Felipe, Chittenden, Watsonville West, Watsonville East, and Moss Landing. Records in the CNDDB were reviewed for these five quadrangles and the surrounding quadrangles.

An Interagency Coordination Meeting was held January 15, 2002 to solicit agency concerns in connection with preparation of the Draft EIS and Biological Assessment for the PVWMA Revised Basin Management Plan projects. A species list for the proposed project was provided by the USFWS (2001), and is presented in the Biological Assessment prepared for the Revised BMP Projects.

Initial biological surveys were conducted throughout the project area by Environmental Science Associates (ESA) Certified Wildlife Biologist Tom Roberts, Trish Tatarian and Brian Pittman, botanist Barbara Leitner, and Habitat Restoration Group (HRG) fisheries biologist Dr. Jerry Smith on March 23 through May 5, 1997, to identify habitat types during the early stages of the proposed project. Terrestrial habitats were mapped and quantified, and quantitative bird surveys (to assess species richness and diversity as an index of habitat quality) were carried out at several locations in the vicinity of the Pajaro River (ESA, 1997, 1999).

Global positioning system (GPS) receivers were used to locate approximate habitat type center points, which were recorded using Universal Transverse Mercator (UTM) coordinates. For each mapped unit, four types of information were recorded: (1) presence of special-status species, either as breeding residents or regular winter visitors; (2) presence of suitable habitat for these species; (3) occurrence of other unique or important biological resources; and (4) WHR habitat types present, as well as notes on predominant plant species present. The information was recorded on standardized data sheets, and ESA photographed specific areas and collected plant samples as needed to supplement the data sheet information.

Several subsequent site assessments were performed in September 1997, March 1999, and June and July 2001. For the purpose of this Biological Assessment, ESA wildlife biologist Christine O'Rourke conducted focused wildlife surveys in February, March, June and July 2002 to ground-truth the initial 1997 surveys and evaluate habitat suitability for special status species. Vegetative habitats, present and past occurrence locations of sensitive species within close proximity of the project area, and habitat for sensitive plant and animal species were examined and compared to the project description to determine potential effects.

4.5.1 ALTERNATIVE A – NO ACTION

With respect to vegetation, fish and wildlife, the No Action Alternative essentially represents a continuation of existing conditions, as described in Section 3.5. Over the short term, there would be a reduction in intensive agriculture. The fallowing of farmland would directly benefit upland grassland species located in the Pajaro Valley, and indirectly benefit aquatic and riparian species by reducing sedimentation and nutrient loading which impair water quality in the Pajaro River and its tributaries. An increase in municipal and industrial development would, however, reverse these benefits.

4.5.2 ALTERNATIVE B – WATER RECYCLING PROJECT AND IMPORT WATER PROJECT

The acreage of habitat loss was calculated using the assumptions of temporary and permanent construction easements for the Import Pipeline under the following conditions: open country (140 feet), potential San Joaquin kit fox habitat (110 feet), irrigation ditches, smaller drainages, and riparian habitat on Graniterock property (40 feet), and large drainage crossings (30 feet at Pajaro River, Pescadero Creek, and Sargent Creek). It is assumed that surface disturbance would occur in the full width of the easement. **Table 4.5.1** presents the results of this analysis.

TABLE 4.5.1
ESTIMATED EXTENT OF HABITAT LOSS
RESULTING FROM THE IMPORT WATER PROJECT

Habitat type	Permanent habitat loss (ac)	Temporary habitat loss (ac)
Valley Foothill Riparian	1.6	--
Coastal Oak Woodland	3.3	--
Coastal Scrub	--	8.8
Annual Grassland	--	56.1
Fresh Emergent Wetland	--	0.1
Crop/Orchard/Vineyard	--	243.8
Urban/Developed	--	53.3
TOTAL	4.9	362.1

Where natural vegetation such as Valley Foothill Riparian habitat is within the study area but does not cross it, this assessment assumes that impacts to these resources would be avoided. For example, just west of U.S. 101 the alignment parallels the Pajaro River. Construction disturbance would occur within crop/orchard/vineyard habitat outside of the riparian corridor. There is sufficient width within the agricultural lands to accommodate all construction activities. The project alignment also has been designed to avoid most trees within coastal oak woodland habitat by traveling along the fringe of these woodlands. The construction corridor was assumed to be 140 feet wide in these areas, although this is likely an overestimate of habitat removal.

The impacts of all activities associated with the project, especially in areas of natural habitat, generally would be temporary, because revegetation would be conducted for these areas. However, loss of forested habitat is considered permanent because of the long period of time required for regrowth. Where project implementation would involve a permanent commitment of urban/developed or crop/orchard/vineyard habitat, this represents no change or a permanent conversion from one relatively low-value habitat type to another.

DISTURBANCE OF POTENTIAL JURISDICTIONAL WETLANDS/WATERS OF THE U.S. AND STREAMBEDS AND BANKS

Import Water Project

Habitat Loss

Jurisdictional wetlands potentially affected by the project are comprised of two habitat types: fresh emergent wetland and valley foothill riparian habitat. The vernal pool east of U.S. 101 would be avoided by construction activities. The proposed Import Pipeline alignment would make seven crossings of Fresh Emergent Wetland, for an estimated habitat loss of 0.1 acre for this type. Six of these examples of Fresh Emergent Wetland are constructed drainage channels surrounded by agriculture. For the purposes of this impact analysis, these lands are presumed to be jurisdictional. The final crossing of fresh emergent wetland is a natural drainage east of Soda Lake that is likely jurisdictional.

The proposed Import Pipeline alignment crosses the following eight drainages that support Valley Foothill Riparian habitat: Millers Canal, the Pajaro River just west of U.S. 101, Sargent Creek, two unnamed drainages near Pescadero Creek, Pescadero Creek, the Pajaro River near Chittenden Pass on the Graniterock property, and the Pajaro River just west of SR 1. In addition, the alignment travels through Valley Foothill Riparian habitat on the south side of the Pajaro River on the Graniterock property. The crossings of Millers Canal and of the Pajaro River just west of U.S. 101 and just west of SR 1 would be constructed using trenchless methods, such as bore-and-jack. The remaining crossings and Valley Foothill Riparian habitat would be trenched resulting in a habitat loss of 1.6 acres for this type. However, direct impacts to creek channels would be minimized by constructing across the shortest distance feasible during the dry season. Following pipeline installation, the channels would be restored to original grade. Original grade may not be reestablished if the California Department of Fish and Game (CDFG) or flood control agencies have jurisdiction and request channel improvements or stabilization. Revegetation would be carried out using locally indigenous plant materials.

Loss of Significant Natural Communities

Coastal riparian forest (Holland, 1986) is the natural community represented along the Pajaro River. This community is listed as “high priority for inventory” by the Natural Heritage Section of CDFG and is considered a special status natural community here. Although the areas proposed for impact are small, any additional loss of riparian forest is an adverse impact.

The other two examples of wetlands, the drainage ditches mapped as the Fresh Emergent Wetland habitat type and the vernal pool are too small and degraded to be considered examples of special status natural communities. However, the natural drainage east of Soda Lake would be considered a natural community.

Integrated Coastal Distribution System

This project would involve two crossings of Watsonville Slough, and crossings of McClusky Slough, Hanson Slough, an unnamed ephemeral drainage south of Trafton Road, and up to twelve irrigation ditches that support fresh emergent wetland. In addition, construction activities would occur adjacent to Harkins Slough, Bennett Slough, and several irrigation ponds that support fresh emergent wetland. Crossings of McClusky Slough and Hanson Slough would be constructed using trenchless techniques, such as bore-and-jack. Habitat removal at the unnamed ephemeral drainage south of Trafton Road would be avoided by crossing this drainage at the culvert within a farm road. Trench crossings of Watsonville Slough and irrigation ditches could impact as much as 0.3 acre of fresh emergent wetland potentially under the jurisdiction of the U.S. Army Corps of Engineers or CDFG. Direct impacts to fresh emergent wetland would be temporary and would be minimized by construction across the shortest distance feasible. Following pipeline installation, Watsonville Slough and the irrigation ditches would be restored to original grade. Permanent loss of wetlands or diminished habitat value is not anticipated.

Loss of Significant Natural Communities

Coastal freshwater marsh (mapped as the fresh emergent wetland habitat type) is the natural community represented at McClusky Slough, Hanson Slough, Bennett Slough, and reaches of Watsonville Slough outside of the project area. This habitat type is listed as "high priority for inventory" by the Natural Heritage Section of CDFG and is considered a special status natural community. At the location of the pipeline crossings, Watsonville Slough is a channelized irrigation ditch that supports lower quality habitat than downstream reaches of the slough. Wetland habitat within irrigation ditches in the project area is degraded due to surrounding agricultural practices. These irrigation ditches are not considered sensitive natural communities.

EFFECTS ON THREATENED AND ENDANGERED SPECIES PRESENT IN FRESH EMERGENT WETLAND, RIPARIAN, AQUATIC AND UPLAND HABITATS

Import Water Project, Integrated Coastal Distribution System

Adverse effects to special-status species could occur from increased sedimentation in streams, dewatering of pools, habitat loss through vegetation removal, destruction of nests and burrows, and construction disturbance at pipeline drainage crossings.

Habitat for special-status animals is present in fresh emergent wetland, valley foothill riparian, aquatic, and upland habitats along the Pajaro River, Pescadero Creek, Sargent Creek and various other drainages in the project area. The special-status animal species associated with this habitat that have the potential to occur in the study area include:

- South-central California coast Steelhead (Federal Threatened and California Species of Concern; Critical Habitat designation)
- Tidewater goby (Federal Endangered and California Species of Special Concern)
- California red-legged frog (Federal Threatened and California Species of Special Concern; Critical Habitat Designation)
- California tiger salamander (Federal Candidate Species and California Species of Special Concern)
- Santa Cruz long-toed salamander (Federal Endangered and California Endangered)
- Western pond turtle (Federal Species of Concern and California Species of Special Concern)
- Least Bell's vireo (Federally and State listed as Endangered)
- Yellow warbler (California Species of Special Concern)
- Yellow-breasted chat (California Species of Special Concern)
- Tricolored blackbird (California Species of Special Concern)
- Nesting raptors (Protected under California Fish and Game Code 3503.5)

For analysis of impacts to these resources, trenching is assumed at the following crossings: Sargent Creek, two unnamed drainages near Pescadero Creek, Pescadero Creek, the Pajaro River near Chittenden Pass on the Graniterock property, Watsonville Slough, up to 19 agricultural drainage ditches (including the drainage ditch west of Aromas), and the drainage just east of Soda Lake. The crossings of Millers Canal, the Pajaro River just west of U.S. 101 and just west of SR 1, McClusky Slough and Hanson Slough, would be constructed using trenchless methods, such as bore-and-jack. The unnamed drainage south of Trafton Road would be crossed at the culvert within a farm road to avoid habitat removal.

South-Central California Coast Steelhead. Steelhead potentially are present at the following project sites: Millers Canal, Pajaro River just west of U.S. 101, Sargent Creek, Pescadero Creek, the Pajaro River near Chittenden Pass on the Graniterock property, and the Pajaro River just west of SR 1. Since steelhead migrate through these sites for spawning, sedimentation and alteration of flows during construction could block or kill either up-migrating adults (December-April) or down-migrating smolts (March-May). In addition to injury or mortality of individuals, open trench construction or potential releases of bentonite during bore-and-jack procedures may result in habitat loss for this species.

Tidewater Goby. Tidewater gobies are known to occur within the Pajaro Lagoon and have been observed up to one mile upstream of the mouth of the Pajaro River. Potential releases of bentonite and other construction materials during the underground crossing of the Pajaro River west of SR 1 may result in injury or mortality of individual tidewater gobies and/or habitat loss for this species.

California Red-Legged Frog. California red-legged frog potentially are present at the following sites along the Import Pipeline alignment: Pajaro River just west of SR 1, the drainage east of Soda Lake, Millers Canal, the drainage west of Aromas, Pescadero Creek, Sargent Creek, the vernal pool east of U.S. 101, and the Pajaro River near Chittenden Pass on the Graniterock property. Dispersing California red-legged frog may utilize low quality habitat at irrigation ditches and seasonal tributaries to the Pajaro River as well. Up to 0.44 acre of potential aquatic and streamside habitat for California red-legged frog (including habitat present in seasonal tributaries to the Pajaro River) could be disturbed by project construction activities. Up to 0.1 acre of dispersal habitat could be disturbed during construction as well. The temporary impact to breeding habitat, limited to standing or flowing water, would be minor because construction in these areas would occur in the dry season. Construction within the riparian habitat could result in mortality or disturbance of individuals.

In the ICDS project area, California red-legged frog habitat potentially occurs in Watsonville Slough, Hanson Slough, McClusky Slough, Harkins Slough, Bennett Slough, the unnamed drainage south of Trafton Road, and irrigation ponds in the project area. Temporary loss of 0.04 acre of potential habitat in Watsonville Slough could result from facility construction activities unless proposed mitigation is implemented. In addition, 0.26 acre of low quality dispersal habitat could be impacted during construction of irrigation ditch crossings.

California Tiger Salamander. The drainage east of Soda Lake, the vernal pool east of U.S. 101, Hanson Slough, Bennett Slough, McClusky Slough, and irrigation ponds in the ICDS project area, provide potential aquatic habitat for California tiger salamander. Construction activities would avoid the vernal pool. However, construction disturbance of the drainage east of Soda Lake, as well as removal of upland aestivation habitat surrounding these sites may result in direct mortality to active or aestivating California tiger salamanders.

Santa Cruz Long-Toed Salamander. Potential habitat for this species is located in Hanson Slough, Bennett Slough, McClusky Slough, and irrigation ponds in the ICDS project area. Construction activities would avoid removal of potential habitat for this species, however, potential impacts to dispersing individuals could occur.

Western Pond Turtle. Areas of permanent water, including Hanson Slough, McClusky Slough, Bennett Slough, irrigation ponds within the ICDS project area, Pajaro River, Pescadero Creek, and Millers Canal, provide potential habitat for the western pond turtle. Project construction activities in these areas could result in direct mortality, nest disturbance and reproductive failure, or habitat degradation due to increased erosion and siltation into creek waters.

Least Bell's Vireo. Riparian habitat crossings of the Pajaro River contained potentially suitable habitat. Construction in these areas could result in the temporary loss of breeding habitat, as well as the potential for reproductive failure if construction occurred during the breeding season for this species.

Yellow Warbler. Yellow warblers were observed in several areas of the Pajaro River during 1997 surveys, and potentially suitable habitat exists at proposed crossings of the Pajaro River, Hanson

Slough, Harkins Slough, and the unnamed drainage south of Trafton Road. Construction in these areas during the nesting season could cause reproductive failure, and removal of trees within the construction zone of impact could temporarily reduce breeding habitat up to a combined total of 1.6 acres.

Yellow-Breasted Chat. Riparian habitat at crossings of the Pajaro River, Hanson Slough, Harkins Slough, and the unnamed drainage south of Trafton Road contained suitable habitat for this species. Construction in these areas could result in the temporary loss of breeding habitat, as well as the potential for reproductive failure if construction occurred during the breeding season for this species.

Tricolored Blackbird. Tricolored blackbirds are colonial nesters that prefer tall stands of emergent vegetation such as cattails and tules, with areas nearby where they can forage on insects. Smaller breeding colonies are also known to use blackberry patches. Suitable, high-quality breeding and foraging habitat is present at McClusky Slough, Bennett Slough, and Harkins Slough. Lower quality habitat is present in irrigation ponds with Fresh Emergent Wetland in the project area. No removal of potential nesting habitat for tricolored blackbird would occur, however, this species could be impacted by construction noise and human disturbance during the breeding season.

Raptors. Raptor species, such as red-tailed hawk and white-tailed kite, the latter a species protected under Fish and Game Code 3511, nest in dense riparian habitats between February and July. Potential nesting areas for these species occur along the Pajaro River and McClusky Slough. Nesting red-tailed hawks were observed in the vicinity of the project area, west of the Pajaro River near U.S. 101. Activities near nesting raptor sites could result in reproductive failure due to loss of habitat or cause abandonment of the nest. CDFG Code Sections 3503 and 3503.5 protect raptors and their nests and eggs.

Water Recycling Project

Potential habitat for special-status animals is present in valley foothill riparian, fresh emergent wetland, and aquatic habitat in the Pajaro River. All construction activities would occur outside the Pajaro River levee in agricultural areas. No sensitive habitat would be disturbed. However, reproductive failure and loss of young of special status nesting birds (least Bell's vireo, yellow warbler, yellow-breasted chat, and raptors) and direct mortality of transient California red-legged frog or western pond turtle may occur as a result of proposed construction near the Pajaro River.

DISTURBANCE TO VERNAL POOL FAIRY SHRIMP, LONGHORN FAIRY SHRIMP, AND CONSERVANCY FAIRY SHRIMP

Import Water Project

A vernal pool that provides low quality habitat for vernal pool invertebrates is located north of the proposed pipeline alignment. Construction activities in the vicinity of this vernal pool have the potential to result in disturbance to these species, if they are present.

DISTURBANCE TO RAPTORS THAT NEST IN COASTAL OAK WOODLAND HABITAT, AND REDUCTION IN THE AMOUNT OF AVAILABLE NESTING HABITAT

Import Water Project

Raptors, including red-tailed hawks and white-tailed kite, are known to nest and forage in oak woodlands in the project area. Construction activities and tree removal in these areas would cause loss of nesting and foraging habitat. Construction activities during the breeding season could cause reproductive failure for that year.

DISTURBANCE TO SAN JOAQUIN KIT FOX AND WESTERN BURROWING OWL IN ANNUAL GRASSLAND HABITAT

Import Water Project

Habitat for special-status animals is present in Annual Grassland habitat in the eastern portion of the study area (see **Maps B1** through **B3** in the Map Appendix). The special-status animal species associated with this habitat that have the potential to occur in the study area include the San Joaquin kit fox and western burrowing owl.

4.5.3 ALTERNATIVE C – IMPORT WATER PROJECT ONLY

DISTURBANCE OF POTENTIAL JURISDICTIONAL WETLANDS/WATERS OF THE U.S. AND STREAMBEDS AND BANKS

Impacts would be the same as those described under Alternative B, above.

EFFECTS ON THREATHENED AND ENDANGERED SPECIES PRESENT IN FRESH EMERGENT WETLAND, AQUATIC AND UPLAND HABITATS

Impacts would be the same as those described under Alternative B, above, although there would be less disturbance to nesting birds and transient red-legged frogs near the Pajaro River without construction of Water Recycling Project facilities.

DISTURBANCE TO VERNAL POOL FAIRY SHRIMP, LONGHORN FAIRY SHRIMP, AND CONSERVANCY FAIRY SHRIMP

Impacts would be the same as those described under Alternative B, above.

DISTURBANCE TO RAPTORS THAT NEST IN COASTAL OAK WOODLAND HABITAT, AND REDUCTION IN THE AMOUNT OF AVAILABLE NESTING HABITAT

Impacts would be the same as those described under Alternative B, above.

DISTURBANCE TO SAN JOAQUIN KIT FOX AND WESTERN BURROWING OWL IN ANNUAL GRASSLAND HABITAT

Impacts would be the same as those described under Alternative B, above.

4.5.4 CUMULATIVE IMPACTS

Section 4.11 of this Draft EIS evaluates cumulative impacts. Implementation of Alternative B or C, in conjunction with CVP contract assignments to PVWMA, could contribute to cumulative changes in agricultural practices and land use in the San Joaquin Valley (e.g., a shift to cultivation of salt-tolerant crops or land retirement). Crop changes to more salt tolerant plants could attract nesting birds, which could be impacted by agricultural operations or the build up of selenium in grass seed. Implementation of bird hazing in the spring, and the mowing of grass prior to maturation would mitigate this impact. Land retirement could provide opportunities for restoration of wildlife habitat. Within the PVWMA service area, other planned projects, in combination with Alternative B or C, could result in the disturbance of natural vegetation and wildlife habitat in the PVWMA service area and its vicinity. Implementation of the measures in **Appendix D** (Table D.4) would reduce the project's contribution to cumulative impacts to vegetation, fish and wildlife.

4.6 CULTURAL RESOURCES

METHODOLOGY

The Analysis of potential cultural resources impacts employs the Criteria of Adverse Effect as developed by the Advisory Council on Historic Preservation (ACHP) in its regulations for the "Protection of Historic Properties" (36 CFR 800).

Impacts could occur if sites, structures, buildings, objects, or districts listed or eligible for listing on the National Register of Historic Places (NRHP) are subjected to the following effects:

- physical destruction or alteration of all or part of the property;
- isolation of the property from, or alteration of the property's setting when that character contributes to the property's qualification for the NRHP;
- introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- neglect of a property resulting in its deterioration or destruction; and
- transfer, lease, or sale of the property.

The proposed action constitutes a federal undertaking that requires compliance with Section 106 of the National Historic Preservation Act (NHPA). For projects deemed federal undertakings, cultural resource impacts are evaluated in terms of eligibility for listing in the NRHP. NRHP criteria for eligibility are defined as follows:

> The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and that:
>
> (a) are associated with events that have made a contribution to the broad pattern of our history;
>
> (b) are associated with the lives of people significant in our past;
>
> (c) embody the distinct characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) have yielded, or are likely to yield, information important in prehistory or history (36 CFR 60.4).

In addition to the eligibility criteria of the NRHP, there are laws, acts, and regulations specific for the protection of Native American resources. These generally include Native American participation if Native American resources are affected or if human remains are encountered, and consultation with the Native American Heritage Commission.

4.6.1 ALTERNATIVE A – NO ACTION

With respect to cultural resources, the No Action Alternative essentially represents a continuation of existing conditions, as described in Section 3.6. No impacts to cultural resources would occur.

4.6.2 ALTERNATIVE B – WATER RECYCLING PROJECT AND IMPORT WATER PROJECT

ALTERATION OR DESTRUCTION OF IDENTIFIED CULTURAL RESOURCES

Import Water Project, Integrated Coastal Distribution System

Six cultural resource sites (CA-SBN-149H, CA-SBN-187, CA-SBN-188, CA-SBN-191H, CA-SCR-318H, and CA-SCL-579) were identified adjacent to and/or within the Import Pipeline alignment. CA-SBN-149H was previously evaluated and is not considered eligible for the National Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR). CA-SBN-191H was the subject of two archaeological investigations and is currently within a trailer park. CA-SCL-579 was not identified during the survey. No significant cultural resource impacts are anticipated at these sites.

CA-SBN-187 and CA-SBN-188 were the subject of limited subsurface investigations but have not been formally evaluated for the NRHP or CRHR. CA-SCR-318H was recorded during the survey for the pipeline and has not been evaluated for NRHP or CRHR eligibility. Construction of the proposed pipeline may directly affect (alter or destroy) these sites. It is not known whether these sites are considered "important archaeological resources" as defined by CEQA or "historic properties" as defined by 36 CFR 800.

Development of the ICDS in the Monterey Service Area may directly or indirectly affect identified resources, which include CA-MNT-638, CA-MNT-618/1328, and CA-MNT-228. Cultural resource studies for the ICDS in the Santa Cruz Service Area were completed in accordance with the Programmatic Agreement (PA) between the U.S. Army Corps of Engineers and the California State Historic Preservation Office. CA-SCR-60 and CA-SCR-130 were determined eligible for inclusion on the NRHP and CRHP. Mitigation of pipeline construction impacts were completed for these sites. CA-SCR-61, CA-SCR-102 and - CA-SCR-154 were avoided during construction. For those sites in the Monterey Service Area of the ICDS which cannot be avoided, studies will be conducted in compliance with the terms of the PA.

The identified cultural resources sites will be avoided to the extent possible. If avoidance is not possible, then the sites must be evaluated for their potential eligibility for listing on the NRHP or CRHR. If any of these sites are determined eligible for the NRHP, altering their current condition would be considered an impact. The purpose of further action would be to define a course of action to satisfy requirements for an Assessment of Adverse Effects (36 CFR 800.5).

Once adequate determinations of eligibility are complete, then evaluation per NEPA or NRHP of known or undiscovered resources can be completed on a site-specific basis depending on the potential impact. In the case of prehistoric archaeological sites, evaluation may be completed by examining existing records and reports, detailed recording, and/or excavation to determine data potential of the sites.

If it is determined that the project may have an adverse effect on historic properties then resolution of those effects must be completed (36 CFR 800.6). For those sites found eligible for the NRHP, measures to mitigate, avoid, or minimize impacts to historic properties must be developed. Historic resource mitigation measures may include further study to evaluate the sites, detailed recording, and/or excavation.

If effects on historic properties cannot be fully determined prior to the undertaking, it may be appropriate to consider the execution of a Programmatic Agreement (PA) (36 CFR 800.14(b) for the Import Water Supply and Water Recycling Facility components. Continuation of the existing PA for the Integrated Coastal Distribution System would address resources in this component. This would satisfy the requirements of Section 106 of the NHPA. The PA may include land managing agencies, tribal entities or other interested parties as signatory or invited signatory parties as appropriate. For the purposes of NEPA, implementation of the PA is expected to reduce potential impacts on historic properties.

DISCOVERY OF PREVIOUSLY UNKNOWN CULTURAL RESOURCES

Import Water Project, Integrated Coastal Distribution System, Water Recycling Project

Significant unknown cultural resources may be buried or obscured by vegetation along the proposed pipeline alignment, and therefore construction of the proposed project could result in degradation and destruction of undiscovered cultural resources.

INCREASED ACCESS DURING CONSTRUCTION COULD RESULT IN VANDALISM OF CULTURAL RESOURCES

Import Water Project, Integrated Coastal Distribution System

Construction activities associated with the proposed Import Pipeline and the ICDS may provide increased accessibility to existing cultural resource sites in the project area. This could result in looting and vandalism of important cultural resources.

SUPPLEMENTAL WELLS COULD POTENTIALLY BE SITED IN AREAS WITH UNDERLYING CULTURAL RESOURCES

Import Water Project, Water Recycling Project

Specific locations of supplemental wells have not yet been identified, and therefore no site-specific investigation has been done for supplemental wells.

4.6.3 ALTERNATIVE C – IMPORT WATER PROJECT ONLY

ALTERATION OR DESTRUCTION OF IDENTIFIED CULTURAL RESOURCES

Impacts would be the same as those described under Alternative B, above.

DISCOVERY OF PREVIOUSLY UNKNOWN CULTURAL RESOURCES

Impacts would be the same as those described under Alternative B, above.

INCREASED ACCESS DURING CONSTRUCTION COULD RESULT IN VANDALISM OF CULTURAL RESOURCES

Impacts would be the same as those described under Alternative B, above.

INJECTION/EXTRACTION WELLS COULD POTENTIALLY BE SITED IN AREAS WITH UNDERLYING CULTURAL RESOURCES

Specific locations of injection/extraction wells have not yet been identified, and therefore no site-specific investigation has been done for injection/extraction wells.

4.6.4 CUMULATIVE IMPACTS

No significant cumulative impacts to cultural resources are anticipated.

4.7 INDIAN TRUST ASSETS

4.7.1 ALTERNATIVE A – NO ACTION

The No Action Alternative represents a continuation of existing conditions as described in Section 3.7. No Indian Trust Assets (ITAs) are within the project area, and thus no impacts on ITAs would occur.

4.7.2 ALTERNATIVE B – WATER RECYCLING PROJECT AND IMPORT WATER PROJECT

DEGRADATION, DESTRUCTION OR RESTRICTION OF INDIAN TRUST ASSETS

Import Water Project, Integrated Coastal Distribution System, Water Recycling Project

As stated in Section 3.7, no Indian Trust Assets (ITAs) are within the project area. Consequently, development of the project would not result in the degradation, destruction or restriction of ITAs.

4.7.3 ALTERNATIVE C – IMPORT WATER PROJECT ONLY

DEGRADATION, DESTRUCTION OR RESTRICTION OF INDIAN TRUST ASSETS

Import Water Project

As stated in Section 3.7, no Indian Trust Assets (ITAs) are within the project area. Consequently, development of the project would not result in the degradation, destruction or restriction of ITAs.

4.8 AIR QUALITY

4.8.1 ALTERNATIVE A – NO ACTION

Existing emissions sources in the Pajaro Valley include tilling (fugitive dust), windblown dust (fugitive dust), pesticide application (fugitive reactive organic gases [ROG]), and combustion of fuel by farm equipment (ROG, nitrogen oxide [NO_X], and particulate matter [PM_{10}]). Implementation of the No Action Alternative would result in approximately 25,660 acres of lost agricultural production, which would reduce these emissions. The severe socioeconomic impacts resulting from this lost agricultural production would likely create pressures for converting fallowed farmland to other uses such as municipal and industrial development. Postulating the specific characteristics of that future development and the air pollutant emissions from such uses would be speculative.

4.8.2 ALTERNATIVE B – WATER RECYCLING PROJECT AND IMPORT WATER PROJECT

GENERATION OF FUGITIVE DUST AND OTHER CRITERIA AIR POLLUTANTS

Import Water Project, Integrated Coastal Distribution System, Water Recycling Project

Construction of the project facilities would generate fugitive dust (including PM_{10}), and other criteria air pollutants from exhaust emissions. A large portion of the total construction dust emissions would result from site grading and excavation activities. Dust emissions would vary from day to day, depending on the phase of construction, the silt content of the soil, and the weather. Daily emissions would depend greatly upon whether construction of the various project components (e.g., Water Recycling Facilities and associated pipelines) would occur simultaneously. Sensitive receptors located near the proposed facilities and pipelines include Moss Landing School at SR 1 and Springfield Road, which is along the pipeline alignment in the Monterey Service Area of the ICDS; and residences located within 300 feet of the Water Recycling Facility.

APPLICATION OF THE GENERAL CONFORMITY RULE

Import Water Project, Integrated Coastal Distribution System, Water Recycling Project

The General Conformity rule (see 58 Fed. Reg. 63214, November 30, 1993) requires that projects that receive federal funding or that require approval of a federal agency must be consistent with the State Implementation Plan (SIP) for the state in which the project is located. The proposed project would be a recipient of federal funds (for planning, design and construction of facilities required to implement water recycling), and would require approvals from Reclamation, the U.S. Army Corp of Engineers, the U.S. Fish and Wildlife Service, and the National Marine Fisheries

Service. Because the project includes continued use of CVP water, Reclamation would have continuing authority and responsibility to ensure that use of CVP water in the Pajaro Valley complies with the terms of the contracts assigned to PVWMA.

The General Conformity rule (codified at 40 CFR part 93, subpart B) covers direct and indirect emissions of criteria pollutants or their precursors for which an area is designated nonattainment or maintenance and that are caused by a Federal action, are reasonably foreseeable, and can practicably be controlled by the Federal agency through its continuing program responsibilities. Under the rule, the first step is to determine whether the rule applies to a given Federal action: a conformity determination is required for each pollutant where the total of direct and indirect emissions in a nonattainment or maintenance area caused by a Federal action would equal or exceed any of the de minimis rates or if those emissions would be *regionally significant*. See 40 CFR 93.153(b) and (i). *Regionally significant emissions* represents 10 percent or more of a nonattainment or maintenance area's total emissions of that pollutant.

In this instance, the applicable pollutant is volatile organic compounds (VOC) because the area is a Federal maintenance area for the ozone NAAQS (see 62 Fed. Reg. 2597, January 17, 1997) and is attainment or unclassifiable for all other NAAQS. (The other ozone precursor, NOx, is not included in this applicability determination because EPA approved a NOx waiver petition under Section 182(f) of the Clean Air Act for the area [60 Federal Register 20233, April 25, 1995].) The applicable de minimis threshold in "maintenance" areas is 100 tons per year of VOC. In addition, within this area, the de minimis rate for VOC is an order of magnitude more restrictive than the rate that corresponds to 10 percent of area-wide VOC emissions; therefore, if the VOC emissions associated with the proposed project would be less than 100 tons per year, then it can be concluded that they would also be well within the 10 percent of emissions threshold.

Based on the applicability evaluation provided below, no conformity determination will be required for this proposed project. The direct emissions associated with the proposed project would be less than the applicable de minimis rate and would not be regionally significant, the emissions associated with the incrementally higher level of agricultural activity (relative to the No Action Alternative) would not be reasonably foreseeable, and the indirect emissions associated with the growth-accommodating aspect of the proposed action would not be controllable as a practical matter by Reclamation through its continuing program responsibilities.

Construction Phase Emissions

Under the General Conformity rule, "direct emissions" means those emissions of a criteria pollutant or its precursors that are caused or initiated by the Federal action and occur at the same time and place as the action. For this project, "direct emissions" are those that would be generated by construction activities for pipelines and water reclamation facilities. Operation of construction equipment would be the primary source of direct VOC emissions associated with construction. Chapter 2, Alternatives, describes the types of construction equipment that would be used and construction schedule/phasing. Generally, construction activity does not generate significant VOC emissions because most of the heavy-duty equipment used for construction is diesel-powered, and combustion of diesel fuel in such equipment generates relatively minor

amounts of VOC. VOC emissions from construction would be expected to be far less than 100 tons in any given year.

Long Term Emissions

Under the General Conformity rule, *indirect emissions* means those emissions of a criteria pollutant or its precursors that: (1) are caused by the Federal action, but may occur later in time and/or may be further removed in distance from the action itself but are still reasonably foreseeable; and (2) the Federal agency can practicably control and will maintain control over due to a continuing program responsibility of the Federal agency. In this context, *reasonably foreseeable emissions* are projected future indirect emissions that are identified at the time the conformity determination is made; the location of such emissions is known and the emissions are quantifiable, as described and documented by the Federal agency based on its own information and after reviewing any information presented to the Federal agency. *Emissions that a Federal agency has a continuing program responsibility for* refers to emissions that are specifically caused by an agency carrying out its authorities, and does not include emissions that occur due to subsequent activities, unless such activities are required by the Federal agency. When an agency, in performing its normal program responsibilities, takes actions itself or imposes conditions that result in air pollutant emissions by a non-Federal entity taking subsequent actions, such emissions are covered by the meaning of a continuing program responsibility. See 40 CFR 93.152 for the definitions of terms and phrases used in the General Conformity rule.

In this instance, there would be two potential types of indirect emissions. First, the proposed project would allow for more intensive farming in the coastal area than would likely occur under the No Action Alternative. Under the No Action Alternative, there would be less intensive farming (e.g., dryland farming or rangeland) throughout the basin due to constraints on groundwater pumping and a reduction in pollutant emissions would result. Agricultural activities generate VOC emissions primarily through the use of pesticides and fertilizers and through the use of farm equipment. However, the conversion to rangeland of over 20,000 acres of prime farmland would create pressure to convert the land to some other use that can cope with the water supply constraints, such as urban development. The VOC emissions associated with an incrementally higher level of agricultural activity in the Valley (under the action alternatives relative to the No Action Alternative) would be caused by this Federal action and, arguably, Reclamation can practicably control and maintain control over these emissions through its continuing program responsibility, specifically, through conditions in contracts with PVWMA regarding the use of CVP water and receipt of federal funds (for construction of related water recycling facilities). However, these VOC emissions would not be *reasonably foreseeable emissions* in that their quantification would require considerable speculation as to the types of uses that ultimately would develop in the area, among other factors. Thus, such emissions would not be considered *indirect emissions* for the purposes of the General Conformity rule.

Second, the proposed project would "free up" groundwater in the Valley that could then be used by urban growth, which, in turn would result in emissions from construction, increased motor vehicle activity, space and water heating, etc. Land use development is regulated by city and county land use authorities and lies outside the continuing program responsibility of Reclamation.

Thus, the related emissions also are not considered *indirect emissions* for the purposes of the General Conformity rule. In addition, even if the emissions associated with urban growth were to be considered *indirect emissions* under the rule, Reclamation could make a positive conformity determination because the infrastructure improvements associated with the proposed project have been sized to be consistent with the same land use forecasts (provided by the Association of Monterey Bay Area Governments [AMBAG]) that were used in developing the applicable SIP (i.e., the area's ozone maintenance plan). See 40 CFR 93.158(a)(5)(v) for the applicable conformity criterion.

4.8.3 ALTERNATIVE C – IMPORT WATER PROJECT ONLY

GENERATION OF FUGITIVE DUST AND OTHER CRITERIA AIR POLLUTANTS

Import Water Project

Impacts would be the same as those described under Alternative B, above.

APPLICATION OF THE GENERAL CONFORMITY RULE

Import Water Project

Impacts would be the same as those described under Alternative B, above.

4.8.4 CUMULATIVE IMPACTS

Section 4.11 of this Draft EIS evaluates cumulative impacts. Within the PVWMA service area, other planned projects, in combination with Alternative B or C, could result in cumulative construction-phase air emissions. Implementation of emissions control measures (specified in Tables D.1, D.2 and D.3 of **Appendix D**) would reduce the project's contribution to this cumulative impact.

4.9 ENVIRONMENTAL JUSTICE

METHODOLOGY

In accordance with Executive Order 12898 and U.S. Bureau of Reclamation policy, environmental justice impacts are evaluated to identify and address disproportionately high and adverse human health or environmental impacts on minority and/or low-income populations. For purposes of this analysis, minority populations are based on the race and ethnicity classifications (including Hispanic), and low-income populations are based on those persons living below the poverty level. The analysis of demographics is based on data from the 2000 U.S. Census, analyzed at a geographic scale commensurate with the potential impact area. The analysis considered effects on employment and water rates, and impacts from facility construction. For construction impacts, the population within any census tracts "touched" by a project component were analyzed by race and income level and compared to Countywide demographics.

4.9.1 ALTERNATIVE A – NO ACTION

The No Action Alternative would not result in disproportionate adverse human health or environmental impacts on minority and/or low-income populations. The reduction of agricultural production would result in a loss of jobs in the agriculture sector, quantified in Section 4.10, Socioeconomics. The majority of the jobs that would be eliminated are held by economically disadvantaged minorities.

4.9.2 ALTERNATIVE B – WATER RECYCLING PROJECT AND IMPORT WATER PROJECT

CONSTRUCTION IMPACTS ON MINORITY OR LOW-INCOME GROUPS

Import Water Project, Integrated Coastal Distribution System, Water Recycling Project

Construction of project facilities would create short-term environmental impacts (noise, dust, traffic disruption) at neighboring land uses. According to the 2000 census data, there is little difference between the ethnic and income compositions of the census tracts affected by construction of facilities associated with the Import Water Project and Water Recycling Project, and the ethnic and income composition of San Benito, Santa Clara, Santa Cruz, and Monterey counties as a whole (see **Table 4.9.1**). Thus, construction nuisance impacts would not be borne predominantly by any minority population or low-income group. PVWMA has adopted as conditions of project approval, a number of measures to reduce construction–phase impacts (refer to Appendix D, Tables D.1 and D.2).

TABLE 4.9.1
DEMOGRAPHICS OF CENSUS TRACTS WHERE PROJECT CONSTRUCTION WOULD OCCUR[a]

Project Component	Total Population	Race						Hispanic	Population in Poverty	Population in Poverty: Affected Area Relative to County
		White	Black	Asian	American Indian	Pacific Islander	Other			
		PERCENT								
Import Pipeline										
San Benito County										
Population	53,234	65.2	1.1	2.4	1.2	0.2	24.9	47.9	10.0	
Affected Population[b]	5,437	72.8	0.8	0.9	0.9	0.1	19.0	36.5	16.8	**17.2**
Difference		7.6	**-0.3**	**-1.5**	**-0.3**	**-0.1**	**-5.9**	**-11.4**		
Santa Clara County										
Population	1,682,585	53.8	2.8	25.6	0.7	0.3	12.1	24.0	7.5	
Affected Population[b]	3,150	85.3	1.4	3.7	0.0	0.0	6.3	11.0	3.5	**0.1**
Difference		31.5	**-1.4**	**-21.9**	**-0.7**	**-0.3**	**-5.8**	**-13.0**		
Santa Cruz County										
Population	255,602	75.1	1.0	3.4	1.0	0.1	15.0	26.8	11.9	
Affected Population[b]	1,350	70.7	0.0	0.4	1.2	0.0	22.4	46.0	13.4	**1.0**
Difference		-4.4	**-1.0**	**-3.0**	**0.2**	**-0.1**	**7.4**	**19.2**		
Monterey County										
Population	401,762	55.9	3.7	6.0	1.0	0.4	27.8	46.8	13.5	
Affected Population[b]	8,156	55.1	0.3	3.7	0.6	0.4	32.7	65.3	14.7	**2.2**
Difference		-0.8	**-3.4**	**-2.3**	**-0.4**	**0.0**	**4.9**	**18.5**		
Recycled Water Facility										
Santa Cruz County										
Population	255,602	75.1	1.0	3.4	1.0	1.0	15.1	26.8	11.9	
Affected Population[b]	4,032	79.7	0.0	3.9	0.4	0.0	13.3	21.1	3.2	**0.4**
Difference		4.6	**-1.0**	**0.5**	**-0.6**	**-0.1**	**-1.7**	**-5.7**		

TABLE 4.9.1 (Continued)
DEMOGRAPHICS OF CENSUS TRACTS WHERE PROJECT CONSTRUCTION WOULD OCCUR[a]

Project Component	Total Population	Race: White	Black	Asian	American Indian	Pacific Islander	Other	Hispanic	Population in Poverty	Population in Poverty: Affected Area Relative to County
		PERCENT								
ICDS										
Santa Cruz County										
Population	255,602	75.1	1.0	3.4	1.0	0.1	15.0	26.8	11.9	
Affected Population[b]	4,032	79.7	0.0	3.9	0.4	0.0	13.3	21.1	3.2	**0.4**
Difference		4.6	-1.0	0.5	**-0.6**	**-0.1**	**-1.7**	**-5.7**		
Monterey County										
Population	401,762	55.9	3.7	6.0	1.0	0.4	27.8	46.8	13.5	
Affected Population[b]	4,756	44.5	0.5	3.8	0.7	0.0	41.4	87.0	20.6	**1.8**
Difference		-11.4	-3.2	-2.2	**-0.3**	**-0.4**	**13.6**	**40.2**		

[a] Bolded numbers indicate the difference in minority (low income populations temporarily affected by project construction versus Countywide minority/low income populations.
[b] Population of census tracts where facility would be sited.

SOURCE: U.S. Census Bureau, *Census 2000*.

EFFECTS ON EMPLOYMENT OF MINORITY OR LOW-INCOME GROUPS

Import Water Project, Integrated Coastal Distribution System, Water Recycling Project

Consistent with NEPA, the No Action Alternative provides the basis for determining adverse impacts associated with the proposed action. Without the proposed action it is expected that there would be a significant reduction in agricultural productivity in the Pajaro Valley and with it a loss of jobs in the agricultural sector. Many of the jobs that would be lost, such as farmhands, are held by economically disadvantaged minorities. Alternative B would ensure the continuation of high levels of agricultural productivity in the Pajaro Valley; therefore, implementation of this alternative would preserve jobs for low income minorities, a beneficial impact.

EFFECTS ON WATER RATES OF MINORITY OR LOW-INCOME GROUPS

Import Water Project, Integrated Coastal Distribution System, Water Recycling Project

The increase in water rates associated with Alternative B is not expected to significantly affect minority or low-income populations. The City of Watsonville provides potable water service to the urbanized areas of the Pajaro Valley (the City and the unincorporated communities of Pajaro, Freedom and Coralitos). About 90 percent of the City's water supply is pumped groundwater. The City will reimburse PVWMA for a share of the project costs through a pass-through charge added to the water bills of the City's customers. Currently, a typical household in the City used 0.3 af per year, or 1,100 cubic feet per month, at a cost of $19.76 per month (including $1.26 to PVWMA). With implementation of Alternative B, the average monthly water bill for a typical household would increase to $22.50 per month (including $4 to PVWMA). With the increase, water rates in Watsonville would still be below the water rates charged throughout the rest of Santa Cruz County.

4.9.3 ALTERNATIVE C – IMPORT WATER PROJECT ONLY

CONSTUCTION IMPACTS ON MINORITY OR LOW-INCOME GROUPS

Import Water Project

Impacts would be the same as those described under Alternative B, above.

EFFECTS ON EMPLOYMENT OF MINORITY OR LOW-INCOME GROUPS

Import Water Project

Impacts would be the same as those described under Alternative B, above.

EFFECTS ON WATER RATES OF MINORITY OR LOW-INCOME GROUPS

Import Water Project

The increase in water rates under Alternative C also would not significantly affect minority or low income populations. With implementation of Alternative C, the average monthly water bill for a typical household would increase to $22.70 per month. With the increase, water rates in Watsonville would still be below the water rates charged throughout the rest of Santa Cruz County.

4.9.4 CUMULATIVE IMPACTS

Section 4.11 of this Draft EIS evaluates cumulative impacts. Implementation of Alternative B or C, in conjunction with CVP contract assignments and others, could contribute to cumulative changes in agricultural practices and land use in the San Joaquin Valley (e.g., a shift to cultivation of salt-tolerant crops or land retirement). However, these changes are primarily occurring due to economic and environmental conditions. These changes often result in the need for less CVP water on those lands, resulting in requests for approval of water service transactions. Under the No Action Alternative, those conditions will continue. Agricultural practices and land uses in the San Joaquin Valley would not change significantly with implementation of either Alternative B or Alternative C.

4.10 SOCIOECONOMICS

METHODOLOGY

The purpose of the agricultural impact analysis was to evaluate the probable economic adjustments by growers and related businesses to the proposed higher water costs in the PVWMA service area resulting from (a) the implementation and financing of the proposed action, and (b) the consequences of not implementing the proposed action. The analysis:

- Characterizes existing agricultural production in the Pajaro Valley and its economic linkage to the broader economy;
- Quantifies expected changes in production costs resulting from increased water costs for representative crops grown in the Pajaro Valley;
- Quantifies expected changes in net cash returns to management due to changes in baseline production costs; and
- Discusses the likely magnitude of long-term adjustments in land rental rates induced by the increased costs for water.

The projected future impacts on agricultural production in the Pajaro Valley were evaluated by assessing the expected changes to the net returns of agricultural production under each of the alternatives. The proposed increase in agricultural water prices (from the increased augmentation charges or direct delivery charges) was identified as the predominant factor affecting future agricultural production. Therefore, the future impact of each alternative was evaluated by estimating the expected changes to the net returns of agriculture resulting from the proposed water price increases.

The current net returns to agricultural production were determined by estimating average per acre production costs and revenues for the region's predominant agricultural crops. These cost estimates were based on typical crop types and cultivation practices currently used in the region. The revenue estimates were based on average yields and crop prices for these crop types and typical cultivation practices by well managed producers. The key assumptions and information used to estimate the average net returns are provided in the following sections. It should be noted that actual cost and revenues for individual growers may vary considerably based on the specifics of their production circumstances (e.g. site conditions, production methods, well depth, management experience etc.). The cost and revenue production estimates are intended to be used to develop the aggregate estimates of the agricultural production in the Pajaro Valley.

The future net returns for agricultural production were projected based on the current net returns and expected changes in production costs (such as increased augmentation charges for irrigation water), crop revenues and/or changes in agricultural production practices associated with each of the project alternatives. The magnitude of the impacts under each action alternative was then evaluated based on comparisons with the impacts projected under the future baseline conditions of the No Action Alternative.

4.10.1 ALTERNATIVE A – NO ACTION

EFFECTS ON AGRICULTURAL PRODUCTION

Basinwide groundwater pumping restrictions necessary to curtail all seawater intrusion would reduce the total annual agricultural water supply from 59,300 af to 12,200 af. It is estimated that the groundwater restrictions would result in approximately 25,660 acres of lost agricultural production with an annual value of $372 million. This would result in significant long-term adverse impacts throughout the agricultural community.

A reduction of approximately 47,000 afy in agricultural water supply would represent nearly an 80 percent reduction in the Pajaro Valley's current agricultural water use. Based on a corresponding decrease to total Pajaro Valley agricultural production (estimated to be approximately $530 million), this reduction would represent approximately a $421 million loss of annual production. A more realistic estimate of the lost future agricultural production would recognize that all the agricultural production remaining on the impacted lands would likely be higher value crops, such as strawberries. Assuming that all the remaining agricultural production would be strawberries, based on an average applied water use of 2.6 af/ac, the 12,200 af of groundwater available for agricultural use would be sufficient for approximately 4,700 acres of strawberry production with a total annual value of approximately $158 million. Therefore, the lost agricultural production would be approximately $372 million annual ($530 million less $158 million).

EFFECTS ON PROPERTY VALUES

Elimination of groundwater pumping would prevent irrigated agricultural production on most of the farmland within the PVWMA service area. Dryland farming or rangeland would be the next best use for the affected properties. Property values for the affected areas would decrease dramatically which would result in significant long term adverse impacts to landowners.

While the current agricultural producers pay annual lease rates estimated at $1,500 to $2,200 an acre, according to local experts and land appraisers, rangeland lease rates for the property would be less than $15 acre. Based on the high cost of production, dryland farming likely would be economically infeasible. Local real estate specialists also estimate that the sale value for the land would be reduced from a current price of $25,000 to $35,000 to less than $1,000 per acre; consequently, the financial impact from the groundwater prohibitions would represent a land value loss of at least $29,000 per acre. While an estimated 4,700 acres of property would continue to be farmable, it is expected that at least 20,000 acres of existing farmland would no longer be farmable since no groundwater would be available. The total direct economic impact from the lost agricultural land would be nearly $580 million in lost capital value to local landowners.

EFFECTS ON EMPLOYMENT AND THE REGIONAL ECONOMY

The permanent reduction in the region's agricultural acreage would decrease the area's agricultural employment and agricultural sales. The economic losses would be represented by both: (1) the reduced annual economic activity from the lost productive use of the previously irrigable farmland, and (2) capital value losses from reduced land values.[1] The projected decrease in agricultural production is estimated at $372 million and would result in a loss of approximately 9,225 agricultural jobs in the region. This would represent a significant long-term adverse impact on the regional economy.

The reduction in the land's productive capacity would drastically decrease both land leases and local agricultural spending. Since fewer growers would be purchasing agricultural supplies, employing farm workers and selling their produce, the economy would experience less economic activity. In addition to the direct loss of farming jobs, there would also be additional indirect and induced job and income losses resulting from the reduction in local agricultural production. Indirect jobs result from supplier purchases made by the farming operations and include industries such as agricultural support services, farming equipment and business services. Induced jobs result from spending made by agricultural production employees. These industries are typically local serving businesses such as retail and personal services.

The magnitude of the indirect and induced impacts can be estimated using an IMPLAN input-output model. The IMPLAN model provides multipliers that estimate the expected indirect and induced changes in jobs and income that may be expected to result from the lost agricultural production.

Using economic multipliers developed from the area by ADE, it is estimated that the projected decrease of $372 million annual agricultural production would result in a loss of approximately 11,530 jobs in region.[2] Of these 11,530 lost jobs, 9,225 agricultural worker jobs, 335 indirect jobs and 1,970 induced jobs (such as general retail and service workers) would be lost. The economic impact of the projected agricultural production loss would also cause an $18.6 million decrease in indirect spending and $130.2 million decrease in induced spending in the local economy.

The projected decrease of 9,225 agriculture jobs is equivalent to a 20.8 percent decrease in the region's agricultural employment which would represent a major long-term adverse impact. The loss of indirect and induced jobs would be expected to have an adverse impact on the regional economy.

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1 It should be noted that these two impacts are interrelated. The land value losses correspond to a capitalized valuation of the annual agricultural production reductions.

2 The multipliers were obtained from ADE's unpublished report "Salinas/Pajaro Valley Growth Alternatives Study" and IMPLAN data.

4.10.2 ALTERNATIVE B – WATER RECYCLING PROJECT AND IMPORT WATER PROJECT

REDUCTION IN NET RETURNS DUE TO HIGHER WATER COSTS

Increased water augmentation charges are required to support the costs of the project and will increase Pajaro Valley growers' crop production costs and lower the net returns per unit of production. This could result in some significant adverse economic impacts on small, economically marginal farming operations that are growing low value crops in the area. However, increased water conservation and better management practices (including crop substitution) could mitigate these impacts. If the current farming operators are unable to absorb and/or adapt to the reduction in their net returns then market forces will likely reduce land rents to offset impacts to net returns.

Although the increase to production costs for the higher value crop rotations would be relatively small (i.e., 1.8 percent to 2.1 percent for delivered water users and 0.7 percent to 0.8 percent for groundwater users), due to the narrow profit margins for agricultural production the impacts on net returns would be significant. It is estimated that the projected $510 increase in water costs for strawberry growers using delivered water could cause growers to experience as much as a 10.9 percent decrease in their net returns. For growers of lower value crops the decrease will be even greater, likely making production of crops such as broccoli no longer financially viable.

However, these impacts represent conservative estimates since increased water conservation methods and better management practices (described in Appendix B) could reduce the magnitude of these impacts. Furthermore, the gradual and predictable implementation of the cost increases will also facilitate and enhance growers' abilities to adapt their production accordingly. In addition, there may be positive production benefits for delivered water users associated with long-term reliability. In any case, if growers are unable to make adequate net returns then there will be market pressure for landowners to reduce lease rates.

These impacts are all minor compared to those that would occur under the Alternative A – No Action, which would likely result in reducing agricultural production to only approximately 4,700 acres, a decrease of almost approximately 85 percent. Under Alternative B, no agricultural production would necessarily be lost since the lands agricultural long term viability would be maintained by the provision of the supplemental water supply.

POTENTIAL REDUCTION IN LAND LEASE RATES AND PROPERTY VALUES

If the current farming operators are unable to absorb and/or adapt to the reduction in their net returns then market forces will likely reduce land rents to offset impacts to net returns. This would result in a significant decrease in land lease rates and property values for landowners.

The impacts to local landowners will depend on the growers' abilities to absorb and/or adapt to the water cost increases. Under the most conservative scenario, that current growers are unable to absorb or adapt their production so as to reduce significantly the water cost increases, land owners would face lease reductions up to the full amount of the net water cost increase.

For example, the net cost increase *(assuming no cost saving from conservation, management or grower profitability)* for a typical landowner with strawberry production using delivered water could be as much as $460 per acre.[3] If current lease rates are $2,200/acre, such a lease reduction would be a significant adverse impact, decreasing annual rent to $1,740 (more than a 20 percent decrease). The net water-cost increases for groundwater users *(assuming no cost saving from conservation, management or grower profitability)* could be up to approximately $205/acre for strawberry producers.

Such reductions in lease rates would also be represented by related land value decreases as the properties' income-generating potential would be reduced. However, in comparison with the No Action Alternative, land prices would remain far higher than if the land's viability for irrigated agricultural production was lost as a result of groundwater pumping restrictions. Furthermore, some agriculture experts suggested that, in the long run, development of a more reliable and higher quality water supply for local agricultural could prove to be a comparative advantage for the region once other competing agricultural areas face future difficulties with their water supplies.

As described in Chapter 2 of the EIS, the Watsonville Area Water Recycling Project Feasibility Study identifies several options for filtration and disinfection processes. The capital and O&M costs for these options vary. The estimated capital and O&M costs for implementing water recycling that were used to determine future water use rates under Alternative B are planning level estimates that fall within the range of costs for the filtration and disinfection options. Therefore, the difference in cost among filtration and disinfection options would not materially affect the estimated future water rates.

COMPARED WITH THE NO ACTION ALTERNATIVE, MAJOR POSITIVE LONG-TERM IMPACT ON THE REGIONAL ECONOMY

It is estimated that there would be a net gain of at least $365 million in direct economic activity and more than 9,045 farming jobs that would be saved compared with conditions under the No Action Alternative. The net present value of the annual agricultural production saved by Alternative C is estimated to be nearly $5.1 billion.[4]

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[3] Net cost increase for delivered water is calculated by subtracting the avoided capital and maintenance costs of wells from the increase in augmentation charges ($510 for Alternative B, assuming a water cost of 2.6 af/acre * $196 net augmentation change increase, and $600 for Alternative C, assuming a water cost of 2.6 af/acre * $207 net augmentation change increase).

[4] Based on a 6 percent discount rate over 30 years. This estimate is comparable to the net present value estimate for the proposed water supply alternatives.

Higher water costs will reduce the net returns to growers and/or land leases to local landowners – thereby reducing their income. Future agricultural water use in 2040 is expected to be 64,400 af, of which 18,500 af would be provided to coastal growers as delivered water at an additional charge of $196/af. The remaining 45,900 af of agricultural groundwater usage would incur an additional augmentation charge of $78/af. Based on this proposed water price schedule, the total increased in annual water costs for agriculture in Pajaro Valley will be $7.2 million.

These "lost" earnings will not benefit the region's economy if it is instead spent outside the region. Although some construction spending would generate short term economic benefits to the regional economy, the majority of the water costs will instead be used as debt service for the water system's construction. In this case, the lost earning will represent an adverse economic impact by reducing local employment and income. This impact is estimated to result in at most a loss of $7.2 million in earning and 179 agricultural jobs. This is not expected to be significant adverse impact to the agricultural industry.

Under Alternative A – No Action Alternative, it is estimated that the region's economy would lose approximately $372 million in direct lost agricultural earnings and 9,225 farming jobs since irrigated farming would not longer be possible due to the loss of nearly 48,000 af of water for local agricultural production. In comparison, Alternative C would maintain these lands' agricultural production capabilities and would thereby save over $365 million of agricultural income and approximately 9,045 farming jobs in the region. This would represent a major positive long-term impact on the region's agricultural industry.

4.10.3 ALTERNATIVE C – IMPORT WATER PROJECT ONLY

REDUCTION IN NET RETURNS DUE TO HIGHER WATER COSTS

Import Water Project

Although the increase to production costs for the higher value crop rotations would be relatively small (i.e. 1.9 percent to 2.2 percent for delivered water users and 0.8 percent to 0.9 percent for groundwater users), due to the narrow profit margins for agricultural production the impacts on net returns would be significant. It is estimated that the projected $540 increase in water costs for strawberry growers using delivered water users could cause the growers to experience as much as a 11.5 percent decrease in their net returns which would represent a significant adverse impact. For growers of lower value crops the decrease would be even greater, likely making production of crops such as broccoli no longer financially viable.

However, these impacts represent conservative estimates since increased water conservation methods and better management practices could reduce the magnitude of these impacts. Furthermore the gradual and predictable implementation of the cost increases will also facilitate and enhance growers' abilities to adapt their production accordingly. In addition, there may be positive production benefits for delivered water users associated with the likely improved water quality and reliability. In any case, if growers are unable to make adequate net returns then there will be market pressure for landowners to reduce lease rates.

These impacts are all minor compared to those that would occur under the No Action Alternative which would likely result in reducing agricultural production to only 4,690 acres, a decrease of almost 85 percent. Under this alternative, no agricultural production would necessarily be lost since the lands agricultural viability would be maintained by the provision of the alternative water supply.

POTENTIAL REDUCTION IN LAND LEASE RATES AND PROPERTY VALUES

Import Water Project

The impacts to local landowners will depend on the growers' abilities to absorb and/or adapt to the water cost increases. Under the most conservative scenario, that current growers are unable to absorb or adapt their production so as to reduce significantly the water-cost increases, land owners would face lease reductions up to the full amount of the net water cost increase.

For example, the net cost increase *(assuming no cost saving from conservation, management or grower profitability)* for a typical landowner with strawberry production using delivered water could be as much as $490 per acre. If current lease rates are $2,200/acre, such a lease reduction would be a significant adverse impact, decreasing annual rent to $1,710 (approximately a 22 percent decrease). The net water cost increases for groundwater users *(assuming no cost saving from conservation, management or grower profitability)* could be up to approximately $230/acre for strawberry producers.

Such reductions in lease rates would also be represented by related decreases in land values as the properties' income-generating potential would be reduced. However, in comparison with the No Action Alternative, land prices for coastal properties would remain far higher than if the land's viability for irrigated agricultural production was lost due to groundwater pumping restrictions. Furthermore, some agricultural experts suggested that over the long run, development of a more reliable and higher quality water supply for local agricultural could prove to be a comparable advantage for the region once other competing agricultural areas face future difficulties with their water supplies.

COMPARED WITH THE NO ACTION ALTERNATIVE, MAJOR POSITIVE LONG-TERM IMPACT ON THE REGIONAL ECONOMY

Import Water Project

It is estimated that there would be a net gain of nearly $365 million in direct economic activity and 9,030 farming jobs which would be saved compared with conditions under the No Action Alternative. The net present value of the annual agricultural production saved by Alternative C is estimated to be nearly $5.1 billion.[5]

[5] Based on a 6 percent discount rate over 30 years. This estimate is comparable to the net present value estimate for the proposed water supply alternatives.

Higher water costs will reduce the net returns to growers and/or land leases to local landowners – thereby reducing their income. Future agricultural water use in 2040 is expected to be 64,400 af, of which 18,500 af would be provided to coastal growers as delivered water at an additional charge of $207/af. The remaining 45,900 af of agricultural groundwater usage would incur an additional augmentation charge of $88/af. Based on this proposed water price schedule, the total increased in annual water costs for agriculture in Pajaro Valley will be $7.9 million.

These "lost" earnings will not benefit the region's economy if it is instead spent outside the region. Although some construction spending would generate short term economic benefits to the regional economy, the majority of the water costs will instead be used as debt service for the water system's construction. In this case, the lost earning will represent an adverse economic impact by reducing local employment and income. This impact is estimated to result in at most a loss of $7.9 million in earning and 196 agricultural jobs. This is not expected to be significant adverse impact to the agricultural industry.

Under Alternative A – No Action Alternative, it is estimated that the region's economy would lose at least $372 million in direct lost agricultural earnings and 9,225 farming jobs since irrigated farming would not longer due to the loss of nearly 48,000 af of water for local agricultural production. In comparison, Alternative C would maintain these lands agricultural production capabilities and would thereby save nearly $365 million of agricultural income and approximately 9,030 farming jobs. This would represent a major positive long-term impact on the local agricultural industry.

4.10.4 CUMULATIVE IMPACTS

Section 4.11 of this Draft EIS evaluates cumulative impacts. Implementation of Alternative B or C, in conjunction with CVP contract assignments to PVWMA, could contribute to cumulative changes in agricultural practices and land use in the San Joaquin Valley (e.g., a shift to cultivation of salt-tolerant crops or land retirement). However, these changes are primarily occurring due to economic and environmental conditions. These changes often result in the need for less CVP water on those lands, resulting in requests for approval of water service transactions. Under the No Action Alternative, those conditions will continue. Agricultural practices and land uses in the San Joaquin Valley would not change significantly with implementation of either Alternative B or Alternative C.

4.11 CUMULATIVE IMPACTS

Cumulative impacts are those effects on the environment that result from the incremental consequences of an action when added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

The Council on Environmental Quality (CEQ) regulations implementing NEPA require that an EIS discuss the cumulative impacts of a project when the proposed or alternative actions may have cumulatively significant impacts, meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and reasonably foreseeable future projects. These projects can be undertaken by federal agencies, the State of California, counties, cities, or other local governmental agencies, non-governmental organizations, and private individuals. Future cumulative impacts should not be speculative, but should be based on known long-range plans, regulations, or operating agreements.

The purpose of this analysis is to disclose cumulative impacts resulting from implementation of Alternative A – No Action, Alternative B – Water Recycling and Import Water Projects, and Alternative C – Import Water Project Only in combination with other projects or conditions, and to indicate the severity of the impacts and their likelihood of occurrence.

Actions that may contribute to cumulative effects include the following, which are described in this section:

- Reasonably foreseeable water service-related actions affecting the San Joaquin Valley
- Development projects in the Pajaro Valley and Pajaro River watershed
- Conversion of native lands to irrigated agriculture in the Pajaro Valley

Table 4.11.1 presents a summary of the potential effects of these actions and how they may influence the effects of implementing the alternatives considered in the Draft EIS.

4.11.1 REASONABLY FORESEEABLE WATER SERVICE-RELATED ACTIONS AFFECTING THE SAN JOAQUIN VALLEY

Under the Central Valley Project Improvement Act (CVPIA), Reclamation is prohibited from entering into any new long-term renewable contracts until certain requirements are met. Therefore, the source of CVP water in PVWMA is likely to come from existing supplies from CVP contractors in the San Joaquin Valley. It is important to note, Reclamation does not have authority over land use changes. The current economical and environmental conditions are driving factors for changes in agricultural practices and land use. These changes often result in the need for less CVP water on those lands resulting in requests for Reclamation's approval for water service transactions. The relationship of these trends resulting in proposals for Reclamation to approve changes in deliveries of CVP water and associated indirect effects in the San Joaquin Valley merits discussion.

TABLE 4.11.1
SUMMARY OF CUMULATIVE EFFECTS

Action	Potential Results	Effects Relative to Draft EIS Alternatives
Reasonably foreseeable water service-related actions affecting the San Joaquin Valley	Changes to irrigated agriculture; reduction in impacts associated with poorly drained soils	Implementation of Alternative B or C could alter farming practices while facilitating Reclamation's objectives for retiring Central Valley agricultural lands with drainage problems
Development projects in the Pajaro Valley	Loss of prime farm land, loss of native lands, sedimentation and run-off, etc.	Additive to impacts caused by Alternatives B and C
Conversion of native lands to irrigated agriculture	Impacts to upland, riparian and wetland habitat and threatened and endangered species	Implementation of Alternative B or C could facilitate cumulative conversion of native lands

Through the purchase of CVP assignments from contractors south of the Sacramento-San Joaquin Delta, or possibly water from non-CVP contractors, PVWMA intends to import a reliable supplemental supply capable of providing 13,400 afy under near-term conditions to agricultural lands along the coast for Alternative B (the PVWMA-preferred alternative) and 17,400 afy for Alternative C. Ultimately, PVWMA will need another 9,000 afy under either action alternative to meet long-term (2040) conditions; the source of water needed to meet long-term conditions could consist of additional surface water imported into the Pajaro Valley from south of the Sacramento-San Joaquin Delta, surface water sources in the Pajaro Valley, or a combination of out-of-basin and in-basin sources (refer to Phase 3 projects in **Table 1.3**, Chapter 1).

PVWMA has purchased a CVP contract assignment from the Mercy Springs Water District (MSWD), and is currently proposing to purchase lands within the Broadview Water District (BWD) and take assignment of the Broadview Water District CVP water supply contract (Reclamation, PVWMA, 1998). The MSWD and BWD are located in the San Joaquin Valley, in Fresno County.

WATER TRANSACTIONS IN THE SAN JOAQUIN VALLEY

Mercy Springs Water District Contract Assignment

PVWMA and Reclamation have completed project-specific NEPA and California Environmental Quality Act (CEQA) documentation for the CVP contract assignment to PVWMA from MSWD (Reclamation, PVWMA, 1998). MSWD is located in the western San Joaquin Valley, in northern Fresno County. The MSWD assignment provides PVWMA with a portion of the total water it needs to secure. Water will continue to be used under the current terms of the MSWD contract.

The MSWD assignment to PVWA is 6,260 afy. Assuming PVWMA receives on average 60 percent of its annual contract allocation[1], the MSWD assignment would yield an annual average of approximately 3,760 afy.

Drainage, salinization of soils, and disposal of toxic elements leached from the soil are pervasive problems throughout the west side of the San Joaquin Valley. Irrigation of the land without adequate drainage causes the water table to rise, which then leads to waterlogging and evapo-concentration of salts and trace elements such as selenium and boron in the crop root zone. This shallow groundwater is damaging to many crops in the region and is a widespread problem for agriculture in the San Joaquin Valley. Without adequate drainage, these lands will eventually become unproductive. Lands within MSWD have poor drainage. Drainage water quality is a significant problem in the region and at MSWD.

Reclamation completed NEPA compliance for the Mercy Springs Water District assignment through preparation of the 1998 *Environmental Assessment and Finding of No Significant Impact – CVP Water Supply Contract Assignment from MSWD to PVWMA* ("Mercy Springs EA/FONSI") and approved the contract assignment to PVWMA in 1999 (Reclamation, PVWMA, 1998). No significant impacts were identified for the MSWD CVP assignment project. **Table 4.11.2** provides a summary of environmental impacts evaluated in the Mercy Springs EA/FONSI, as well as measures to address those impacts.

Broadview Water District Contract Assignment

PVWMA is investigating the potential to purchase, on a willing-seller/willing-buyer basis, approximately 9,100 acres of lands within the BWD and take assignment of BWD's CVP water supply contract (Contract No. 14-06-200-8092-IR7) for 27,000 acre-feet per year of entitlement.

Under the proposed concept, PVWMA would remove the full 9,100 acres within the BWD from CVP irrigated agricultural practices and fallow those lands. The 9,100 acres of fallowed lands will be disked and managed on a regular basis for weed, insect, and pest control. Ultimate disposition of the lands has not yet been determined. Approximately an additional 100 acres owned by the BWD, which are not part of this proposed transaction, would continue to be irrigated with available drain water as part of a regional drainage management demonstration program. Under the proposed transaction, Reclamation would provide PVWMA water service under the same terms and conditions that are currently held by BWD. PVWMA would then be required to put the water to beneficial use within its service territory and/or throughout the CVP system. Delivery of the CVP water to the Pajaro Valley would not occur until the Import Pipeline is constructed. Until delivery can be made, PVWMA would intend to sell the assigned CVP water on an annual basis for interim use by other agricultural CVP water users.

Lands within the BWD suffer from inadequate drainage and shallow groundwater problems as described above for the MSWD.

[1] Reclamation has predicted that agricultural CVP contractors south of the Delta may receive only 60 percent of their annual contract allocations on a long-term average basis. This delivery figure, while subject to various considerations, is explained further in the CVPIA Programmatic EIS.

TABLE 4.11.2
SUMMARY OF IMPACTS IDENTIFIED IN THE MERCY SPRINGS EA/FONSI

Potential Impacts	Environmental Measures
Water Resources, Geology and Soils	
Loss of source of good quality water that could be used to flush salts and prevent accumulation that will eventually degrade groundwater quality to a level that affects crop suitability and, ultimately, the feasibility of agriculture.	Shift in crop patterns to more salt tolerant plants in some areas.
Increased use of shallow groundwater consistent with Groundwater Management Plan, lowering near-surface shallow groundwater table, moving soluble salts and minerals deeper into the soil, and improving drainage water quality.	Groundwater pumping in accordance with applicable Groundwater Management Plan. Beneficial effect on drainage water quality.
Increased reuse of drainage water ▪ reduction in drainage water ▪ reduction in selenium concentrations through application to salt-tolerant grasses ▪ more rapid salt accumulation in soils, hastening land retirement	Benefit. Long-term regional benefit to productive agricultural lands due to reduced groundwater use and drainage associated with land retirement.
Expansion of cattle grazing operations that could compact and expose soils to wind and water erosion leading to air quality and water quality effects.	Implementation of livestock Best Management Practices including erosion control measures.
Crop changes to more salt tolerant grasses could reduce application of agricultural chemicals, reducing water quality effects and the handling of hazardous materials.	Benefit
Land Use	
No changes in land use types in MSWD such as conversion of agricultural land to non-agricultural land.	
Socioeconomics	
Change in cropping pattern and irrigation method not likely to substantially change farm operations. Reduction in agricultural production in MSWD is consistent with the goals of the San Joaquin Valley Drainage Program.	
Vegetation, Fish and Wildlife	
Crop changes to more salt tolerant plants, including grasses could attract nesting birds, which could be impacted by agricultural operations or build up of selenium in grass seed.	Bird hazing activities implemented in the spring. Mowing prior to grass maturation to prevent selenium accumulation in the seed.
Air Quality	
No effect. If livestock grazing is implemented, sound livestock management practices would be implemented to prevent soil compaction and exposure of soils to wind erosion and dust emissions.	Implementation of livestock Best Management Practices
Other Resources	
No effects for the following resources: cultural resources, Indian Trust Assets, environmental justice, aesthetics.	

PVWMA is in the process of developing the details of the proposed project. Reclamation and PVWMA are preparing an Environmental Assessment and Initial Study in compliance with NEPA and CEQA to determine if the proposed project would potentially result in any significant environmental impacts. Other alternatives may emerge as a result of scoping for these documents. The environmental documents will investigate the potential environmental effects on existing drainage water quantity and quality resources, socioeconomic impacts of fallowing the lands, and the potential for cumulative impacts in any of the resources areas. If it is found that the proposed project would not have any resulting adverse environmental impacts then a Finding of No Significant Impact and a Negative Declaration or a Mitigated Negative Declaration will be prepared to meet the requirements of NEPA and CEQA. If it is determined that the proposed project would result in having one or more adverse environmental impacts that can not be mitigated, then an Environmental Impact Statement (EIS) and Environmental Impact Report (EIR) will be developed to meet the requirements of NEPA and CEQA. Given the current status of this proposed project, determining future land uses within the BWD service area and specific environmental effects would be speculative.

Other Requests for CVP Contract Assignments

Other requests for CVP contract assignments include the following:

- *Request for CVP Contract Assignment: Banta-Carbona Irrigation District (BCID)*. The BCID is located in the San Joaquin Valley. The Draft Environmental Assessment/FONSI for Westside Irrigation District/City of Tracy Water Assignment Project (BCID, City of Tracy, Reclamation; July 2003) analyzes the proposed partial contract assignment of up to 5,000 afy of water pursuant to an existing CVP contract from WSID to the City of Tracy. The proposed assignment would result in the permanent change of the amount of CVP water delivered to BCID and the City of Tracy. The Draft EA/FONSI concludes that the proposed action would not result in significant environmental effects, has no contribution to cumulative effects, and would not cause or result in land conversions from agricultural to urban uses. Urbanization of lands within the BCID has been occurring and will continue to occur, which has reduced the need for water for agricultural uses. No impacts to groundwater are anticipated.

- *Request for CVP Contract Assignment: West Side Irrigation District (WSID)*. The Westside Irrigation District is located in the San Joaquin Valley. The *Environmental Assessment for Westside Irrigation District/City of Tracy Water Assignment Project* (WSID, City of Tracy, Reclamation; July 2003) analyzes the proposed partial contract assignment of up to 5,000 afy of water pursuant to an existing CVP contract from WSID to the City of Tracy. The assignment results in the permanent change of the amount of CVP water to be delivered to WSID and the City of Tracy through the duration of the CVP contract and any renewal of the contract. The Draft EA/FONSI concludes that the proposed action would not result in significant environmental effects, has no contribution to cumulative effects, and would not cause or result in land conversions from agricultural to urban uses. Urbanization of lands within the WSID has been occurring and will continue to occur, which has reduced the need for water for agricultural uses.

In combination, the MSWD assignment, BWD assignment as currently proposed, and proposed assignments to the City of Tracy from the BCID and WSID, if approved, could total up to 43,260 afy. As indicated above, NEPA documentation has been completed for three out of four

of these projects. Based on this documentation, none of these projects would result in significant effects on the environment. None of these assignments would substantially affect continued agricultural production nor result in the conversion of agricultural land to urban uses. Rather, as noted above, these cases represent economic and environmental forces in the San Joaquin Valley that affect future agricultural practices independent of the proposed assignments. Implementation of the Import Water Project under Alternative B or Alternative C in conjunction with CVP contract assignments to PVWMA could result in lands with impaired drainage being retired, consistent with the purpose of and need for Reclamation's land retirement programs. Retirement of drainage-impaired lands is discussed below.

OTHER REASONABLY FORESEEABLE WATER SERVICE-RELATED ACTIONS AFFECTING THE SAN JOAQUIN VALLEY

Reclamation acknowledges that other actions have occurred or are anticipated to occur, including retirement of drainage-impaired lands, inclusions and exclusions of lands resulting from changes to water district boundaries, transfers and exchanges, the Central Valley Project Improvement Act (CVPIA), and other non-reclamation actions that will affect the San Joaquin Valley. These actions, individually and cumulatively, have the potential to affect lands in the San Joaquin Valley in a number of ways, as described below.

- *Retirement of Drainage-Impaired Lands*. Through the San Joaquin Valley Drainage Program and the land retirement program being implemented under the Central Valley Project Improvement Act (CVPIA), Reclamation has been engaged in the selective purchase from willing sellers of irrigated lands that are characterized by low productivity, poor drainage, and high selenium concentrations in shallow groundwater. The impacts of land retirement that would occur under these programs are evaluated in the CVPIA PEIS and *Central Valley Project Improvement Act Land Retirement Program Demonstration Project Final Environmental Assessment* (Reclamation, 1999). **Table 4.11.3** summarizes the impacts, beneficial and adverse, of implementing the land retirement program demonstration project. The Land Retirement Program EA/FONSI identified no significant impacts. The CVPIA PEIS estimated that up to 30,000 acres of land in the San Joaquin and Tulare Lake regions could be retired; however, the land retirement program is still in development. Predicting cumulative land use changes resulting from full implementation of the land retirement program and their environmental consequences is speculative and cannot be determined at this time.

- *Transfers and Exchanges*. Results in the temporary movement of water to areas where needed and to efficiently manage existing supplies. Usually transfers and exchanges occur due to varying hydrological conditions in Central California. Typically these actions do not lead to long-term land use changes or impacts to resources.

- *CVPIA*. The CVPIA amended previous authorizations of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic water supply uses, and fish and wildlife enhancement having an equal priority with power generation. The CVPIA is being implemented to off-set environmental impacts associated with operation of the CVP and to protect, restore and enhance fish and wildlife habitats in the Central Valley. The proposed project does not conflict with the implementation of the CVPIA programs.

TABLE 4.11.3
SUMMARY OF POTENTIAL IMPACTS BASED ON THE LAND RETIREMENT PROGRAM DEMONSTRATION PROJECT FINAL EA

Permanently fallow farmland (dryland farming)
Soils:
- Without regular cultivation permeability may diminish.
- Evaporation of shallow groundwater, drawing salts etc. into the root zone.

Surface Water:
- Transfer of CVP water out of service area.
- Beneficial effect on quality of surface water runoff (less pesticide/herbicide application).

Groundwater:
- Beneficial: decline in water table.
- Beneficial: maximize drainage source reduction.
- Bare soil evaporation.
- Cumulative: Assuming demand for water allocation remains and is satisfied by pumping, beneficial effects on groundwater depth, adverse from irrigating with poor quality water, land subsidence.

Socioeconomic:
- Loss of income and jobs
- Potential disproportionate impacts to minority or low-income groups
- Potential loss of income from property tax payments for governments
- Reduced demand for farming inputs such as fertilizer and machinery
- Reduced demand for household goods/services and consequential reduced income/employment
- Increased spending on local goods/services due to increased income received from payment for fallowed farmland

Conversion to wildlife habitat (short-term application of CVP water to assist reestablishment of native vegetation)
Soils:
- Diminished permeability.

Surface Water:
- Long-term transfer of all CVP water.
- Beneficial effect on quality of surface water runoff (less pesticide/herbicide application).

Groundwater:
- Same as fallowing minus bare soil evaporation potential.

Socioeconomic:
- Increased local spending for habitat restoration of retired land.
- Increased spending on recreation due to increased vegetation and wildlife species.

Consequences of No Action
Soils:
- Increased salinity of local soils and decreased fertility (degree depends on drainage outlets).
- Salt-tolerant crops likely do not provide enough economic return to cover production costs.

Surface Water:
- Land will continue to be irrigated until drainage problems make it uneconomical.

Groundwater:
- Continued degradation of shallow groundwater system.
- Increase in lands underlain by shallow groundwater table.

SOURCE: United Stated Department of the Interior, Final Environmental Assessment for the Central Valley Project Improvement Act Land Retirement Program Demonstration Project, November, 1999.

- *Other non-Reclamation Actions*. In addition, there are other non-Reclamation actions occurring in Central California that affect land use (oil production, urbanization, etc). These actions are separate actions occurring chiefly as a result of economic pressures. When added together, these separate actions may contribute to diminishing habitat, loss of agricultural lands, and agriculturally related employment opportunities. Separate environmental documentation would be prepared by local agencies to address these losses. Depending upon land use decisions by local agencies, these losses may be offset by continued dry land farming or grazing providing some employment opportunities for economically disadvantaged workers, planned wildlife enhancement programs, or new businesses could offset economic losses from the agricultural sector.

CUMULATIVE EFFECTS ASSOCIATED WITH WATER SUPPLY TRANSATIONS IN THE SAN JOAQUIN VALLEY

These trends, resulting in potential reduction in agricultural lands under production, are generally caused by economic or environmental conditions and will likely continue. Lands in the San Joaquin Valley have converted from agricultural to municipal and industrial uses for the past decade as a result of economic forces and demands for housing. Lands with low productivity and poor drainage have been retired as a result of economic forces as well as undesirable environmental conditions creating disincentives for farmers to continue. These forces are independent of the CVP contract assignments described above. Consequently, the urbanization and retirement of lands within the San Joaquin Valley has been occurring and will continue to occur, under either Alternative A No Action, or Alternative B or C.

4.11.2 DEVELOPMENT PROJECTS IN THE PAJARO VALLEY AND PAJARO RIVER WATERSHED

Table 4.11.4 lists current or pending municipal and industrial development projects that were considered in the evaluation of cumulative impacts. These projects were identified by the City of Watsonville Community Development Department, the Monterey County Planning and Building Inspection, and the planning departments of Santa Cruz County, San Benito County, Santa Clara County, and the City of Gilroy.

Alternative B or C would be expected to be fully implemented within two to three years, with construction of various project components staggered throughout this period. It is not known whether the timing of any of the planned projects listed in **Table 4.11.4** would coincide with construction of components under Alternatives B or C. The schedules of construction projects frequently change due to various factors (e.g., permit processing, project funding). If project construction did happen simultaneously, impacts would fall within the categories of temporary environmental impacts. Examples include temporary increases in traffic, noise, air emissions from construction vehicles, erosion, and sedimentation. Standard measures to reduce these impacts are identified in Appendix D of this EIS (e.g., preparation of Storm Water Pollution Prevention Plans). PVWMA will coordinate with the appropriate local planning and permitting agencies regarding the timing of construction projects that would occur near Alternative B or C project sites. Such coordination will help to minimize multiple disruptions to the same areas.

TABLE 4.11.4
PLANNED AND APPROVED PROJECTS IN PAJARO VALLEY AND PAJARO RIVER WATERSHED

City of Watsonville
140-unit Sunset Cove residential subdivision
114-unit Bay Breeze residential subdivision
390-unit Vista Montana residential development
Pajaro Valley Unified School District high school
16-unit residential subdivision on Airport Blvd.
27,405 square-foot industrial building complex at 547 Airport Blvd.
300-unit Seaview Ranch residential subdivision
16-unit townhouse development at 108 Green Valley Road
16 affordable housing units at 55 Ross Avenue
Home Depot store

Northwestern San Benito County
140-unit Rancho Larios residential subdivision
15-unit Highland Meadows residential subdivision

City of Gilroy
1,643-unit Glen Loma Ranch residential subdivision with commercial uses, parks, and open space

Northern Monterey County
Agricultural distribution center expansion (72,000 to 195,000 square feet)
17-lot residential subdivision on Salinas Road
6-unit Tanglewood subdivision
Pajaro Valley Golf Course expansion

Santa Cruz County
99-unit Pajaro Lane Affordable Housing Project
60-unit affordable housing apartment complex with commercial uses and a child care center on Freedom Boulevard

SOURCES: Boyle, 2001; Monterey County, 2003; City of Gilroy, 2003.

The PVWMA will also submit plans related to, and comply with the requirements of, encroachment permits, which will provide further opportunity for coordination of multiple projects.

LAND USE

The total amount of prime agricultural land that would be lost due to the projects listed in **Table 4.11.4** is unknown. Alternative A – No Action would result in over 20,000 acres of prime farmland being fallowed or converted to rangeland as a consequence of lost irrigation water. Although construction of the facilities proposed under Alternatives B or C would result in incremental losses in prime farmland, implementation of either alternative would keep thousands of agricultural lands in production.

GEOLOGY AND SOILS

Construction of the projects listed in **Table 4.11.4** and Alternatives B or C would result in short-term cumulative erosion hazards. As a major construction project in the Pajaro Valley, the selected alternative would be one of the major sources of short-term erosion combined with that of the other projects. Implementation of erosion and sedimentation control measures (specified in Tables D.1, D.2, and D.3 of Appendix D) would reduce the project's contribution to this cumulative impact.

WATER RESOURCES AND WATER QUALITY

Construction of planned and approved projects and the selected alternative would result in short-term cumulative sedimentation and construction-related contaminant accumulation and runoff. Project construction would be a major new source of potential water quality degradation because if unmanaged, silt and other contaminants from the cumulative impact area could be transported by surface water into surface streams, sloughs and the Pajaro River. Best Management Practices such as revegetation and stabilization of construction areas would control and eliminate the sources of sedimentation and surface water contaminants. Implementation of the measures in Appendix D would reduce the project's contribution to cumulative construction impacts.

VEGETATION, FISH, AND WILDLIFE

Approved and planned development would result in the disturbance of natural vegetation and wildlife habitat in the PVWMA service area and its vicinity. Construction of the proposed facilities under Alternative B or C would contribute to these impacts. Implementation of the measures in Appendix D (Table D.4) would reduce the project's contribution to cumulative impacts to vegetation, fish and wildlife.

AIR QUALITY

Implementation of the projects listed in Table 4.11.4 and Alternative B or C would result in cumulative construction-phase air emissions. Implementation of emissions control measures (specified in Tables D.1, D.2 and D.3 of Appendix D) would reduce the project's contribution to this cumulative impact.

OTHER

No significant cumulative adverse impacts are anticipated for the following: cultural resources, Indian Trust Assets, environmental justice, and socioeconomics.

4.11.3 CONVERSION OF NATIVE LANDS TO IRRIGATED AGRICULTURE IN THE PAJARO VALLEY

The PVWMA service area is now included in the CVP Consolidated Place of Use, pursuant to orders issued by the SWRCB, Division of Water Rights, dated July 19, 2002. The orders approved a change in Place of Use and amended 13 of Reclamation's CVP water right permits to include 30,000 net acres within a gross area of 70,000 acres in the PVWMA service area, as shown on USBR Map #214-208-12480, dated November 1, 1996.

The proposed action assumes no net change in the total number of acres under irrigation in the PVWMA, although water use in the agricultural sector is expected to increase somewhat due to a shift in crop types (that approximately 2,000 acres of deciduous crops would be converted to berry crops). It would be possible in the future, and authorized in the water rights permit, for PVWMA to extend CVP water service to currently non-agricultural lands. This raises the

potential for land use changes in the future, such as conversion of native lands to agricultural uses, which could have significant environmental impacts. Predicting exactly what and where the impacts would occur would be speculative. Nonetheless, on February 5, 2002, PVWMA adopted the following measures as conditions of project approval to mitigate this potential future impact:

- **CEQA Compliance.** Delivery of CVP water for use in areas beyond the 30,200 acres of agricultural lands [shown in Figure 4.C-2 of the Revised BMP EIR] shall be permitted only in accordance with the terms for delivery to Contractor's Service Area pursuant to any contract for the delivery of CVP water between Reclamation and PVWMA, and in accordance with any and all laws, including CEQA and NEPA. The appropriate local land use agency will be the lead agency for preparation of an environmental document for any proposed land use changes; PVWMA will be the lead agency for any actions specific to water system improvements or other PVWMA actions needed to provide CVP water [to areas beyond those shown in Figure 4.C-2].

- **Endangered Species Act Compliance.** PVWMA will not deliver water for the purpose of converting any native lands to agriculture uses unless and until the project sponsor has complied with the Endangered Species Act and has determined that such conversion will not likely affect listed species or that appropriate mitigation has been provided. PVWMA intends to provide CVP water to existing irrigated agricultural lands. PVWMA currently is not proposing to provide any CVP water for M&I purposes, nor is it proposing to provide CVP water outside of the approximately 30,200 acres of agricultural lands [shown in Figure 4.C-2 of the Revised BMP EIR]. If PVWMA is the lead agency for development of water system improvements and construction or operation of those improvements or any other PVWMA actions that could adversely affect threatened or endangered species, PVWMA will consult with the appropriate resource agency (California Department of Fish and Game, US Fish and Wildlife Service, and/or National Marine Fisheries Service) pursuant to all applicable laws, including CEQA and NEPA. PVWMA will implement project-specific mitigation measures and permit conditions as appropriate.

4.12 RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

This section describes the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity.

Many of the impacts associated with the action alternatives are short term, and would occur during construction. Examples include temporary disruption of farming during pipeline construction, soil erosion, and temporary effects on fish and wildlife habitat. The proposed action includes measures to restore agricultural soils disturbed during pipeline construction and allows for farming to occur over the pipeline. Measures to preclude adverse effects on streams from soil erosion also are included in the proposed action. In the long term, the mitigation measures included as part of the proposed action would make up for short-term effects on the habitat of threatened and endangered species. Most disturbed areas will restore quickly; however, riparian habitat at Pescadero Creek and oak woodland habitat would be affected for a much longer period due to the replacement of mature trees removed during pipeline construction.

The long-term benefits of either action alternative relative to the No Action Alternative relate to water quality and agriculture. Either action alternative would improve water quality over the long term by correcting seawater intrusion and overdraft problems, which in turn preserves long-term agricultural production. The long-term benefits to the 25,660 acres of irrigated agriculture in the Pajaro Valley outweigh the permanent loss of less than 8.2 acres of prime agricultural land (under Alternative B).

4.13 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are those which cause either directly or indirectly the use of natural resources so that they cannot be restored or returned to their original condition. For example, the extirpation of a species from an area is an irreversible commitment. For both Alternative B and Alternative C, these potential irreversible impacts are associated with consumption of resources:

- construction materials;
- labor; and
- energy needed for construction, operation, and maintenance.

In addition, both action alternatives would permanently convert prime agricultural land to water production facilities (Water Recycling Facility and Supplemental Wells under Alternative B, and injection/extraction wells under Alternative C).