SECTION 4.0
ANALYSIS OF ALTERNATIVES TO THE PROPOSED PROJECT

4.1 INTRODUCTION

CEQA requires that an EIR consider a reasonable range of alternatives to a proposed project that can attain most of the basic project objectives, but has the potential to reduce or eliminate significant adverse impacts of the proposed project and may be feasibly accomplished in a successful manner, considering the economic, environmental, social and technological factors involved. An EIR must evaluate the comparative merits of the alternatives (CEQA Guidelines Sections 15126.6(a), (d) and (e)). If certain alternatives are found to be infeasible, the analysis must explain the reasons and facts supporting that conclusion. Section 15126.6(d) also requires that, if an alternative would cause one or more significant effects in addition to those caused by the proposed project, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed. One of the alternatives analyzed must be the "No Project" alternative (CEQA Guidelines Section 15126.6(e)). The EIR must also identify alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and should briefly explain the reasons underlying the lead agency's determination (CEQA Guidelines Section 15126.6(c)).

For convenience, the project objectives are repeated below.

The WSIP is proposed to meet the following project objectives:

- Provide a cost-effective, safe and reliable source of domestic water supply for the IWVWD's customers;
- Provide a 20 percent system redundancy to ensure water supply to IWVWD's customers during maximum pumping days; and
- Meet the IWVWD's current and future water production requirements, including increases in domestic water demand resulting from projected population increases of approximately 1 percent per year in Kern County and no additional connections in San Bernardino County.

The only significant impact of the Proposed Project that cannot be mitigated is a cumulative impact to groundwater quality, because the Proposed Project contributes to existing groundwater depressions that are suspected to cause the co-mingling of good quality and lesser quality groundwater. The Proposed Project's impacts to groundwater quality are discussed in detail in Sections 3.8 and 5.1, and are summarized in Section 4.1.1, below. As described in CEQA Guidelines Section 15126.6(a) (above), alternatives have been considered that would lessen or avoid this impact and would also feasibly attain most of the basic objectives of the project.

Section 4.2 also provides an analysis of a No Project Alternative, which is required by the CEQA Guidelines. The Guidelines define the No Project Alternative as "the circumstance under which the project does not proceed" (Guidelines Section 15126.6(e)(3)(B)).

The environmentally superior alternative is also identified, as provided in the State CEQA Guidelines (Section 4.4). The Guidelines state that if the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

4.1.1 Summary of Significant Impacts that Cannot Be Mitigated

Existing groundwater pumping from all users in the Indian Wells Valley has created groundwater depressions, such that groundwater elevations in these areas are lower than those in surrounding areas. It is assumed, therefore, that water levels dropping throught the basin has caused the co-mingling of good quality and lesser quality water. The increased pumping from the Proposed Project, however, is a very small fraction of the existing total pumping from the basin that has created the groundwater depressions. Thus, the contribution of the Proposed Project to the change in groundwater quality is very small and cannot be quantified, measured, or monitored.

It is important to note that this impact on the aquifer would occur whether or not the Proposed Project is implemented. In fact, even if all of the pumping by IWVWD was to cease, more groundwater would still be pumped from the basin than is being recharged. Groundwater depressions would still persist, and lower-quality groundwater would continue to mingle with higher-quality groundwater. Therefore, the nominal increase in pumping that would occur as part of Phase 2 of the Proposed Project would be less-than-significant at the project level, but significant and unavoidable at a cumulative level.

4.2 ALTERNATIVES DEVELOPMENT

4.2.1 Pumping Alternatives

As discussed in Section 2.1.2, in 2010, Layne Christensen Company prepared an evaluation of the existing water supply wells, the water quality in the existing wells, and the impacts of increasing water supply through additional pumping at existing wells and new wells (Layne Christensen Company 2010). Based on the evaluation, four existing wells and four new well sites were selected for further assessment. The existing wells were Wells 18, 30, 31, and 34 (see Figure 2-2 in Section 2.0). The new well locations were proposed Well 35 (as described for the Proposed Project), a new well located at the southeast corner of Las Flores Avenue and N. Victor Street (Well 36), and two well locations in the southwest corner of NAWS China Lake.

Seven model scenarios (six pumping configurations plus a "status quo" scenario to represent the existing pumping configuration) were constructed and run for the 13-year period of 2008 to 2020. The six pumping configurations represented combinations of different existing and new wells.

The ultimate objective was to compare the short-term and long-term regional water levels resulting from the proposed pumping configurations to the water levels predicted for the "status

quo" pumping configuration. The models were run twice, once for annualized pumping rates and once to account for seasonal variations in pumping (more pumping occurs in the summer than in the winter). Scenario 6 resulted in the fewest impacts to groundwater levels and groundwater quality, and a CEQA Initial Study and Notice of Preparation (NOP) of an Environmental Impact Report (EIR) were prepared for the WSIP with Scenario 6 from the 2010 Layne Christensen model as the Proposed Project.

As described in Section 1.0, the NOP was distributed to agencies and the public for the purposes of soliciting comments on the scope of the EIR from July 6 to August 4, 2011. Comments were received from stakeholders concerning the production demand estimates used in the WSIP. Based on input received during the scoping period, the following changes were made to the WSIP:

- Production demand estimates have been recalculated and lowered based on new information from the Navy and growth estimates from Kern COG as projected in the Urban Water Management Plan (IWVWD 2011);
- Phase 3 has been eliminated, because alternative water sources may become available after 2015. Well 36, which would have been located on the southeast corner of Las Flores Avenue and N. Victor Street, is no longer proposed as part of this project. Future water supply projects would require separate evaluation under CEQA;
- Well 17 would not be removed from service during the planning period (prior to 2015).

After the scoping period, the WSIP was revised as described above, resulting in the Proposed Project analyzed in this EIR. New groundwater modeling was conducted by Layne Hydro (the successor firm to Layne Christensen) in August 2011 to reflect the new Proposed Project and alternative scenarios, as summarized below in Table 4.2-1.

Table 4.2-1
Comparison Pumping Alternatives Evaluated in 2010 and 2011

Alternative	2010 Configuration[1]	2011 Configuration
Scenario 0 (No Project)	No Project/Status Quo	♦ No Project/Status Quo ♦ Well 17 remains
Scenario 1	♦ Increased pumping at existing Wells 30 & 34 ♦ Two new wells on NAWS China Lake ♦ Well 17 abandoned	Not carried forward for analysis[2]
Scenario 2	♦ Increased pumping at existing Wells 31 & 34 ♦ Two new wells on NAWS China Lake ♦ Well 17 abandoned	Not carried forward for analysis[2]
Scenario 3	♦ Increased pumping at existing Wells 18 & 34 ♦ Two new wells on NAWS China Lake ♦ Well 17 abandoned	Not carried forward for analysis[2]

Alternative	2010 Configuration[1]	2011 Configuration
Scenario 4 (Alternative 1)	♦ Increased pumping at existing Wells 30 & 34 ♦ Two new wells (Wells 35 and 36) ♦ Well 17 abandoned	♦ Increased pumping at existing Wells 30 & 34 ♦ One new well (Wells 35) ♦ Well 17 remains
Scenario 5 (Alternative 2)	♦ Increased pumping at existing Wells 30 & 31 ♦ Two new wells (Wells 35 and 36) ♦ Well 17 abandoned	♦ Increased pumping at existing Wells 30 & 31 ♦ One new well (Well 35) ♦ Well 17 remains
Scenario 6 (Proposed Project)	♦ Increased pumping at existing Wells 18 & 34 ♦ Two new wells (Wells 35 and 36) ♦ Well 17 abandoned	♦ Increased pumping at existing Wells 18 & 34 ♦ One new well (Well 35) ♦ Well 17 remains

Source: Layne Christensen Company 2010, Layne Hydro 2011

Notes: [1]With the 2010 modeling scenarios, existing Well 17 was assumed to have been removed from service by 2015 for all scenarios, including Scenario 0 (status quo). With the 2011 modeling scenarios, existing Well 17 was assumed to be operational through 2015.

[2] Meetings with the Navy in late 2010 and early 2011 have indicated that the Navy's process for evaluating such a joint use is likely to take several years with no guarantee of approval. Therefore, these alternatives are no longer being considered. See Section 4.5.1 for additional information.

As with the original modeling in 2010, the ultimate objective was to compare the short-term and long-term regional water levels resulting from the proposed pumping configurations to the water levels predicted for the "status quo" pumping configuration. The models were again run twice, once for annualized pumping rates and once to account for seasonal variations in pumping (more pumping occurs in the summer than in the winter). Scenario 6 resulted in the fewest impacts to groundwater levels, and was selected as the Proposed Project. Additional information on modeling and water resources impacts is provided in Section 3.8.

4.2.2 Water Conservation Efforts Common to All Alternatives

The IWVWD's existing water conservation efforts would be continued with all alternatives, including the No Project Alternative. As a result of the IWVWD's conservation efforts, the average annual water consumption for connections within the IWVWD has decreased from approximately 269 gallons per capita per day in 1998 to approximately 243 gallons per capita per day in 2009 (IWVWD 2007, 2011). These water conservation efforts include:

- Conservation based rate structure: Since 1982, the IWVWD has developed and used an ascending block water rate structure. This rate structure provides for higher water rates when higher water use occurs, and is intended to encourage water conservation. In 2009, the District revised its rate structure, significantly increasing the rates of its highest level of use over 100 percent. Currently, the charge in the highest useage rate tier is 582 percent greater than the charge in the lowest usage rate tier.

- Conservation education: The IWVWD has provided educational services to inform the public about the need for water conservation and how to use water more efficiently.

These educational services include school programs, presentations to various organizations, demonstration gardens, public service announcements, and the IWVWD newsletter.

- Conservation measures: The IWVWD has adopted various conservation and recycling practices. These practices include water surveys, free water-saving devices such as low-flow showerheads, water audits/leak detection, system repairs, landscape conservation assistance, public information programs, detailed accounting of water use, and cooperation with the City of Ridgecrest.

- Conservation regulations: The IWVWD has adopted two water conservation ordinances requiring water-efficient landscape as a condition of new IWVWD service. Additionally, IWVWD has a water-efficient landscape ordinance that addresses water use practices and prohibits water runoff and waste for existing connections (IWVWD 2011).

These conservation efforts would continue with all alternatives, including the No Project Alternative. During a water supply emergency, the existing Water Shortage Contingency Plan and other measures described in the Urban Water Management Plan (IWVWD 2011) would be enacted. This includes a four-stage rationing plan that provides for voluntary and mandatory rationing depending on the causes, severity, and anticipated duration of the water supply shortage. During the volunteer rationing stage, a customer reduction goal of water use from 15 to 20 percent is requested. During the mandatory rationing stages, customer reductions of 30 to 40 percent would be required. For the 30 percent reduction, customers would have sufficient water for indoor uses, but non-essential (e.g., outdoor) water uses would not be allowed. For the 40 percent reduction, indoor uses would also be limited.

4.3 ALTERNATIVES CARRIED FORWARD FOR ANALYSIS

Scenarios 0 (status quo), 4, and 5 from the groundwater analysis (Layne Christensen Company 2010, Layne Hydro 2011) were carried forward for further analysis. Additionally, discussions with NAWS China Lake in late 2010 and early 2011 revealed that there is excess production capacity in existing wells on the base that IWVWD may be able to use. Therefore, this alternative was added to the analysis. These alternatives were selected because they are reasonable alternatives to the Proposed Project, including alternative locations, which would feasibly attain the basic objectives of the Proposed Project.

A fourth alternative was added that would avoid the significant cumulative impact to water quality by eliminating Phase 2 of the Proposed Project.

4.3.1 Alternative 1 – Scenario 4: Improve Wells 30 and 34/Construct Well 35

4.3.1.1 Description

With this alternative, new Well 35 would be constructed, and the nominal capacity of existing Wells 30 and 34 would be increased. New well construction and improvements to existing wells would be the same as described for the Proposed Project. Alternative 1 would be constructed in two phases:

- Phase 1 – improve Well 34 and construct Well 35 (2012)
- Phase 2 – improve Well 30 (2015)

The well pumping plant maximum day demand and capacity with 20 percent redundancy for Alternative 1 is shown on Table 4.3-1.

Table 4.3-1
IWVWD Domestic Water System
Nominal Capacity of Well Pumping Plants Compared to Maximum Day Demand(plus 20% Safety Factor), With Alternative 1
(values in gpm)

WELL	PHASE	
	Phase 1 (2012)	Phase 2 (2015)
9A	1,000	1,000
10	1,100	1,100
11	1,000	1,000
13	1,100	1,100
17	1,200	1,200
30	1,400	2,300
31	1,200	1,200
18	1,200	1,200
33	1,200	1,200
34	2,200	2,200
35	1,000-2,200	1,000-2,200
NOMINAL CAPACITY	**13,600-14,800**	**14,500-15,700**
PRODUCTION DEMAND (max day plus 20% safety factor)	**13,960**	**14,350**
PRODUCTION CAPACITY (NEED) SURPLUS	**(360)-840**	**150-1,350**

4.3.1.2 Impacts

Air Quality. With this alternative, air quality impacts would be associated with the improvement and operation of two existing wells and the construction of one new well, similar to the Proposed Project. Air quality impacts would be similar to those described for the Proposed Project. The project would contribute to short-term construction-related emissions within the project sites. However, emissions associated with construction would be below the significance thresholds and impacts would therefore be less than significant. Project construction would be subject to EKAPCD Rule 402, which requires minimization of fugitive dust emissions through dust control measures during construction. These measures would include application of water or other dust suppressants during construction activities and removal of track-out from paved areas. These measures constitute best management practices for dust control.

As with the Proposed Project, the main impact associated with operation of this alternative would be associated with inspection and maintenance activities, which would mainly involve worker vehicle emissions. Minor emissions may be associated with indirect emissions associated with energy use for the electric pumps and maintenance. Operational emissions would be lower than the construction emissions on both a maximum daily and annual basis, and therefore would be less than significant.

Biological Resources. Impacts associated with this alternative would be the same as described for the Proposed Project, because the ground-disturbing activities would be the same size and in the same location, although Well 35 would be constructed in the first phase. No impacts were identified to sensitive plant species. Direct and indirect impacts to wildlife species (desert tortoise, Mojave ground squirrel and burrowing owl) could occur as a result of this alternative; however, mitigation measures identified for the Proposed Project that would reduce these impacts to a less-than-significant level would also apply to this alternative.

Cultural and Paleontological Resources. Impacts associated with this alternative would be the same as described for the Proposed Project, because the ground-disturbing activities would be the same size and in the same location, although they would occur in the first phase. The only potential impacts would be to unknown, buried cultural and paleontological resources. Mitigation measures were identified for the Proposed Project that would reduce these potential impacst to a less-than-significant level. These mitigations would also apply to this alternative.

Geology and Soils. Impacts to geology and soils would be similar to the Proposed Project, and would all be related to erosion and topsoil removal from the construction of Well 35. These impacts would be reduced to a less than significant impact with mitigation as described for the Proposed Project. These mitigations would also apply to this alternative.

Greenhouse Gas Emissions. Greenhouse gas emissions would be associated with the construction and operation of a new well and the refitting and operation of two existing wells, similar to the Proposed Project. As with the Proposed Project, greenhouse gas emissions are not expected to be significant, and no mitigation measures are required.

Hazards and Hazardous Materials. Because this alternative would improve two existing wells and construct one new well, impacts are anticipated to be similar to the Proposed Project. The impacts would be less-than-significant-impact for construction and well development as the transport of hazardous materials is regulated by the State and the transport of such materials to the site would be in compliance with all State regulations. These materials would only be present during construction and well development and would be removed upon completion of the project. In addition, any groundwater discharges would comply with the *Water Quality Control Plan for the Lahontan Region, North and South Basins*, commonly referred to as the Basin Plan (RWQCB 2005), as discussed in Section 3.7. Impacts as a result of disinfection/treatment facilities, discharge pond, and accidental spills would be less-than-significant.

Hydrology and Water Quality. Project-level impacts to hydrology and water quality would be greater thanthose described for the Proposed Project. However, project-level impacts with this alternative would still be less than significant with mitigation.

The primary goal of the Proposed Project, and of IWVWD, is to provide safe water that meets all applicable drinking water standards. The District owns and operates many wells and treatment units that meet applicable standards for sanitary seals and water quality objectives. For example, the wells include a 50-foot sanitary seal to protect water quality. Water delivered by the District to customers meets state and federal drinking water standards. The retrofit of existing Well 34 and the construction of Well 35 during Phase 1 and the retrofit of existing Well 30 during Phase 2 would be completed in the same manner as existing District facilities. As such, this alternative would not violate any water quality standards or waste discharge requirements. No mitigation measures are required.

Changes in groundwater levels for this alternative were modeled in August 2011 (Layne Hydro 2011, Appendix G). These model results indicate that, over 10 years, Alternative 1 may result in an additional eight to 10 feet of drawdown in the immediate areas of wells 34 and 35, similar to the Proposed Project. However, the area of predicted water level increase in the intermediate area anticipated with Alternative 1 would be smaller than with the Proposed Project. Therefore, impacts to groundwater levels would be greater than with the Proposed Project, but would be able to be mitigated. Mitigation measures would be the same as described for the Proposed Project.

This alternative would not involve the discharge of water offsite or into any other water bodies. As discussed above, the wells would be constructed in accordance with applicable standards and would produce groundwater that meets all drinking water standards. Water discharged to the ground surface would percolate back into the ground. Water used to disinfect the wells would be dechlorinated before being discharged to the ground surface and would not violate applicable water quality standards or waste discharge requirements. A less than significant impact would occur.

This alternative would contribute to the overall pumping in the basin that has created groundwater depressions, which is assumed to result in co-mingling of good quality and lesser quality water throughout the basin, similar to the Proposed Project. The increased pumping from this alternative, however, is a very small fraction of the total pumping from the basin that has created the co-mingling of good quality and lesser quality water. Thus, the contribution of this alternative to the change in water quality is miniscule and cannot be quantified, measured,

or monitored. While it may be possible to mitigate for this impact at individual wells by adjusting the depth of the well screen or using wellhead treatment, it is not possible to mitigate for this impact in the intervening aquifer. It is important to note that this impact on the aquifer would occur whether or not this alternative is implemented. In fact, even if all of the pumping by IWVWD was to cease, more groundwater would still be pumped from the basin than is being recharged. Groundwater depressions would still persist and lower-quality groundwater would continue to co-mingle with higher-qualilty groundwater. As discussed in Section 3.8, the average groundwater pumping from the basin over the last 30 years has been about 26,000 acre-feet per year. Over the same time period, the average pumping by IWVWD (including the entities acquired in the 1980s) has been about 8,000 acre-feet per year. Thus, non-IWVWD pumping has averaged 18,000 acre-feet per year, while the annual recharge is between 8,000 acre-feet and 11,000 acre-feet. Therefore, the non-IWVWD pumping exceeds the recharge rate by 7,000 acre-feet per year to 10,000 acre-feet per year. The minor incremental increase in pumping that may occur as part of Phase 2 of this alternative is nominal in comparison to the non-IWVWD pumping. On a Project-specific basis, similar to the Proposed Project, this impact is less than significant. On a cumulative basis, this impact is significant, unavoidable, and unmitigable, similar to the Proposed Project.

As stated above and in Section 3.8, the existing baseline environmental conditions include a significant water quality situation. Therefore, the significant impact exists with or without the implementation of this alternative and unavoidable cumulative impacts to groundwater quality would occur. To be clear, these impacts would occur in the absence of this alternative and it is not possible to quantify, measure, or monitor the potential nominal contribution from the alternative. Therefore, this potential cumulative impact is unmitigable and would persist with or without the implementation of the alternative.

Noise. Noise impacts would be similar to the Proposed Project, because Alternative 1 also involves construction of new Well 35 and improvements to two existing wells. As with the Proposed Project, this alternative would not result in significant impacts. However, mitigation measures were recommended in order to reduce the construction noise levels to the extent practicable and help minimize the potential annoyance at nearby sensitive receivers. These mitigation measures would also apply to this alternative.

4.3.2 Alternative 2 – Scenario 5: Improve Wells 30 and 31/Construct Well 35

4.3.2.1 Description

With this alternative, new Well 35 would be constructed, and the nominal capacity of existing Wells 30 and 34 would be increased (Table 4.3-2). New well construction and improvements to existing wells would be the same as described for the Proposed Project. Alternative 2 would be constructed in three phases:

- Phase 1 –construct Well 35 (2012)
- Phase 2 – improve Wells 30 and 31 (2015)

The well pumping plant maximum day demand and capacity with 20 percent redundancy for Alternative 2 is shown on Table 4.3-2.

Table 4.3-2
IWVWD Domestic Water System
Nominal Capacity of Well Pumping Plants Compared to Maximum Day Demand (plus 20% Safety Factor), With Alternative 2
(values in gpm)

WELL	PHASE	
	Phase 1 (2012)	Phase 2 (2015)
9A	1,000	1,000
10	1,100	1,100
11	1,000	1,000
13	1,100	1,100
17	1,200	1,200
30	1,400	2,300
31	1,200	2,300
18	1,200	1,200
33	1,200	1,200
34	1,200	1,200
35	1,000-2,200	1,000-2,200
NOMINAL CAPACITY	**12,600-13,800**	**14,600-15,800**
PRODUCTION DEMAND (max day plus 20% safety factor)	**13,960**	**14,350**
PRODUCTION CAPACITY (NEED) SURPLUS	**(1,360)-(160)**	**250-1,450**

4.3.2.2 Impacts

Air Quality. With this alternative, air quality impacts would be associated with the improvement and operation of two existing wells and the construction of one new well, similar to the Proposed Project. Air quality impacts would be similar to those described for the Proposed Project. The project would contribute to short-term construction-related emissions within the project sites. However, emissions associated with construction would be below the significance thresholds and impacts would therefore be less than significant. Project construction would be subject to EKAPCD Rule 402, which requires minimization of fugitive dust emissions through dust control measures during construction. These measures would include application of water or other dust suppressants during construction activities and removal of track-out from paved areas. These measures constitute best management practices for dust control.

As with the Proposed Project, the main impact associated with operation of this alternative would be associated with inspection and maintenance activities, which would mainly involve worker vehicle emissions. Minor emissions may be associated with indirect emissions associated

with energy use for the electric pumps and maintenance. Operational emissions would be lower than the construction emissions on both a maximum daily and annual basis, and therefore would be less than significant.

Biological Resources. Impacts associated with this alternative would be the same as described for the Proposed Project, because the ground-disturbing activities would be the same size and in the same location, although Well 35 would be constructed in the first phase. No impacts were identified to sensitive plant species. Direct and indirect impacts to wildlife species (desert tortoise, Mojave ground squirrel and burrowing owl) could occur as a result of this alternative; however, mitigation measures identified for the Proposed Project that would reduce these impacts to a less-than-significant level would also apply to this alternative.

Cultural and Paleontological Resources. Impacts associated with this alternative would be the same as described for the Proposed Project, because the ground-disturbing activities would be the same size and in the same location, although they would occur in the first phase. The only potential impacts would be to unknown, buried cultural and paleontological resources. Mitigation measures were identified for the Proposed Project that would reduce these potential impacst to a less-than-significant level. These mitigations would also apply to this alternative.

Geology and Soils. Impacts to geology and soils would be similar to the Proposed Project, and would all be related to erosion and topsoil removal from the construction of Well 35. These impacts would be reduced to a less than significant impact with mitigation as described for the Proposed Project. These mitigations would also apply to this alternative.

Greenhouse Gas Emissions. Greenhouse gas emissions would be associated with the construction and operation of a new well and the refitting and operation of two existing wells, similar to the Proposed Project. As with the Proposed Project, greenhouse gas emissions are not expected to be significant, and no mitigation measures are required.

Hazards and Hazardous Materials. Because this alternative would improve two existing wells and construct one new well, impacts are anticipated to be similar to the Proposed Project. The impacts would be less-than-significant-impact for construction and well development as the transport of hazardous materials is regulated by the State and the transport of such materials to the site would be in compliance with all State regulations. These materials would only be present during construction and well development and would be removed upon completion of the project. In addition, any groundwater discharges would comply with the *Water Quality Control Plan for the Lahontan Region, North and South Basins*, commonly referred to as the Basin Plan (RWQCB 2005), as discussed in Section 3.7. Impacts as a result of disinfection/treatment facilities, discharge pond, and accidental spills would be less-than-significant.

Hydrology and Water Quality. Project-level impacts to hydrology and water quality would be greater than those described for the Proposed Project. However, project-level impacts with this alternative would still be less than significant with mitigation.

The primary goal of the Proposed Project, and of IWVWD, is to provide safe water that meets all applicable drinking water standards. The District owns and operates many wells and treatment units that meet applicable standards for sanitary seals and water quality objectives. For example, the wells include a 50-foot sanitary seal to protect water quality. Water delivered

by the District to customers meets state and federal drinking water standards. The construction of Well 35 during Phase 1 and the retrofit of existing Wells 30 and 31 during Phase 2 would be completed in the same manner as existing District facilities. As such, this alternative would not violate any water quality standards or waste discharge requirements. No mitigation measures are required.

Changes in groundwater levels for this alternative were modeled in August 2011 (Layne Hydro 2011, Appendix G). These model results indicate that, over 20 years, Alternative 2 may result in an additional eight to ten feet of drawdown in the immediate area of Well 35, similar to the Proposed Project. However, the area of predicted drawdown would extend further north than the Proposed Project. Additionally, the area of predicted water level increase in the intermediate area would be smaller than with the Proposed Project. Therefore, impacts to groundwater levels would be greater than with the Proposed Project, but would be able to be mitigated. Mitigation measures would be the same as described for the Proposed Project.

This alternative would not involve the discharge of water offsite or into any other water bodies. As discussed above, the wells would be constructed in accordance with applicable standards and would produce groundwater that meets all drinking water standards. Water discharged to the ground surface would percolate back into the ground. Water used to disinfect the wells would be dechlorinated before being discharged to the ground surface and would not violate applicable water quality standards or waste discharge requirements. A less than significant impact would occur.

This alternative would contribute to the overall pumping in the basin that has created the groundwater depressions, which is assumed to result in co-mingling of good quality and lesser quality water throughout the basin, similar to the Proposed Project. The increased pumping from this alternative, however, is a very small fraction of the total pumping from the basin that has created the groundwater depressions. Thus, the contribution of this alternative to the co-mingling of lower-quality groundwater with higher quality groundwater is miniscule and cannot be quantified, measured, or monitored. While it may be possible to mitigate for this impact at individual wells by adjusting the depth of the well screen or using wellhead treatment, it is not possible to mitigate for this impact in the intervening aquifer. It is important to note that this impact on the aquifer would occur whether or not this alternative is implemented. In fact, even if all of the pumping by IWVWD was to cease, more groundwater would still be pumped from the basin than is being recharged. Groundwater depressions would still persist and lower-quality groundwater from the perimeter of the basin would continue to co-mingle with higher quality groundwater. As discussed in Section 3.8, the average groundwater pumping from the basin over the last 30 years has been about 26,000 acre-feet per year. Over the same time period, the average pumping by IWVWD (including the entities acquired in the 1980s) has been about 8,000 acre-feet per year. Thus, non-IWVWD pumping has averaged 18,000 acre-feet per year, while the annual recharge is between 8,000 acre-feet and 11,000 acre-feet. Therefore, the non-IWVWD pumping exceeds the recharge rate by 7,000 acre-feet per year to 10,000 acre-feet per year. The minor incremental increase in pumping that may occur as part of Phase 2 of this alternative is nominal in comparison to the non-IWVWD pumping. On a Project-specific basis, similar to the Proposed Project, this impact is less than significant. On a cumulative basis, this impact is significant, unavoidable, and unmitigable, similar to the Proposed Project.

As stated above and in Section 3.8, the existing baseline environmental conditions include a significant water quality situation. Therefore, the significant impact exists with or without the implementation of this alternative and unavoidable cumulative impacts to groundwater quality would occur. To be clear, these impacts would occur in the absence of this alternative and it is not possible to quantify, measure, or monitor the potential nominal contribution from the alternative. Therefore, this potential cumulative impact is unmitigable and would persist with or without the implementation of the alternative.

Noise. Noise impacts would be similar to the Proposed Project, because Alternative 2 also involves construction of new Well 35 and improvements to two existing wells. As with the Proposed Project, this alternative would not result in significant impacts. However, mitigation measures were recommended in order to reduce the construction noise levels to the extent practicable and help minimize the potential annoyance at nearby sensitive receivers. These mitigation measures would also apply to this alternative.

4.3.3 Alternative 3 - Additional Water Production from Existing NAWS China Lake Wells

4.3.3.1 Description

With this alternative, water from existing wells on NAWS China Lake would be transferred to IWVWD in the summer months to provide additional nominal capacity during high demand days (Table 4.3-3). The water would be pumped from the existing Navy wells to the existing IWVWD 30-inch pipeline located between the NAWS China Lake boundary and Highway 178. The water transfer would begin in 2012. Water would be transferred according to the following schedule (Krieger and Stewart 2011):

Beginning in 2012

- June 15 to September 15: 2.2 million gallons per day (MGD)
- September 15 to October 15: 1.0 MGD

Beginning in 2015

- May 15 to June 15: 1.0 MGD
- June 15 to September 15: 3.7 MGD
- September 15 to October 15: 2.5 MGD

This alternative would require the construction of a booster station located on NAWS China Lake property where the current intertie is located. The booster station would be constructed in the existing disturbed area for the NAWS China Lake reservoirs, located north of Inyokern Road/SR 178 approximately 0.5 mile east of Jack Ranch Road.

With this alternative, proposed new well 35 would not be constructed and existing wells 18 and 34 would not be improved. Adoption of this alternative could take several years to go through the Navy's approval process with no guarantee of approval and would require the completion of a National Environmental Policy Act (NEPA) document by the Navy.

The well pumping plant maximum day demand and capacity with 20 percent redundancy for Alternative 3 is shown on Table 4.3-3.

Table 4.3-3
IWVWD Domestic Water System
Nominal Capacity of Well Pumping Plants Compared to Maximum Day Demand (plus 20% Safety Factor), With Alternative 3
(values in gpm)

WELL	PHASE	
	Phase 1 (2012)	Phase 2 (2015)
9A	1,000	1,000
10	1,100	1,100
11	1,000	1,000
13	1,100	1,100
17	1,200	1,200
30	1,400	1,400
31	1,200	1,200
18	1,200	1,200
33	1,200	1,200
34	1,200	1,200
Existing Navy wells	1,800	2,550
NOMINAL CAPACITY	**13,400**	**14,150**
PRODUCTION DEMAND (max day plus 20% safety factor)	**13,960**	**14,350**
PRODUCTION CAPACITY (NEED) SURPLUS	**(560)**	**(200)**

4.3.3.2 Impacts

Air Quality. With this alternative, air quality impacts would be associated with the construction and operation of a booster station and increased pumping at existing wells on NAWS China Lake. Air quality impacts would be similar to those described for the Proposed Project. The project would contribute to short-term construction-related emissions within the project sites. However, emissions associated with construction would be below the significance thresholds and impacts would therefore be less than significant. Project construction would be subject to EKAPCD Rule 402, which requires minimization of fugitive dust emissions through dust control measures during construction. These measures would include application of water or other dust suppressants during construction activities and removal of track-out from paved areas. These measures constitute best management practices for dust control.

As with the Proposed Project, the main impact associated with operation of this alternative would be associated with inspection and maintenance activities, which would mainly involve worker vehicle emissions. Minor emissions may be associated with indirect emissions associated with energy use for the electric pumps and maintenance. Operational emissions would be lower than the construction emissions on both a maximum daily and annual basis, and therefore would be less than significant.

Biological Resources. Impacts associated with this alternative would be similar to those described for the Proposed Project, because well improvements and new construction would involve similar amounts of ground disturbing activities in similar habitats. Direct and indirect impacts to wildlife species (desert tortoise, burrowing owl, and Mojave ground squirrel) could occur as a result of this alternative; however, mitigation measures identified for the Proposed Project that would reduce these impacts to a less-than-significant level would also apply to this alternative.

Cultural and Paleontological Resources. Impacts associated with this alternative would be similar to those described for the Proposed Project. It is unlikely that significant cultural or paleontological resources exist where the booster station would be constructed, because this area is already highly disturbed. Therefore, the only potential for impacts is to unknown subsurface cultural and paleontological resources. Mitigation measures were identified for these types of resources for the Proposed Project, which would also apply to this alternative. Impacts would be less than significant after mitigation.

Geology and Soils. Impacts to geology and soils would be similar to the Proposed Project, and would all be related to the construction of the booster station, which has the potential to cause erosion and remove topsoil from disturbed areas. As discussed in Section 3.2 Air Quality, the best management practices from EKAPCD's Rule 402 would be applied. This is a potentially significant impact, which would be reduced to a less than significant impact with mitigation. These mitigations would also apply to this alternative.

Greenhouse Gas Emissions. Greenhouse gas emissions would be associated with the construction and operation of a booster station and the refitting and operation of existing wells, similar to the Proposed Project. As with the Proposed Project, greenhouse gas emissions are not expected to be significant, and no mitigation measures are required.

Hazards and Hazardous Materials. Because this alternative would improve existing wells and construct a booster station, impacts are anticipated to be similar to the Proposed Project. The impacts would be less-than-significant-impact for construction and well development as the transport of hazardous materials is regulated by the State and the transport of such materials to the site would be in compliance with all State regulations. These materials would only be present during construction and well development and would be removed upon completion of the project. In addition, any groundwater discharges would comply with the *Water Quality Control Plan for the Lahontan Region, North and South Basins*, commonly referred to as the Basin Plan (RWQCB 2005), as discussed in Section 3.7. Impacts would be less-than-significant.

Hydrology and Water Quality. Project-level impacts to hydrology and water quality would be similar to those described for the Proposed Project, and would be less than significant with this alternative. The potential impacts of the Proposed Project on hydrology and water quality are discussed in detail in Section 3.8.

The primary goal of the Proposed Project, and of IWVWD, is to provide safe water that meets all applicable drinking water standards. The District owns and operates many wells and treatment units that meet applicable standards for sanitary seals and water quality objectives. For example, the wells include a 50-foot sanitary seal to protect water quality. Water delivered by the District to customers meets state and federal drinking water standards. The retrofit of Navy wells and construction of the booster station would meet all requirements of the Regional

Water Quality Control Board. As such, this alternative would not violate any water quality standards or waste discharge requirements. No mitigation measures are required.

This alternative would also involve increased pumping in the Indian Wells Valley that may affect private wells. This is a potentially significant impact that can be mitigated with a similar monitoring program as the Proposed Project.

This alternative would not involve the discharge of water offsite or into any other water bodies. As discussed above, the wells would be constructed in accordance with applicable standards and would produce groundwater that meets all drinking water standards. Water discharged to the ground surface would percolate back into the ground. Water used to disinfect the wells would be dechlorinated before being discharged to the ground surface and would not violate applicable water quality standards or waste discharge requirements. A less than significant impact would occur.

This alternative would contribute to the overall pumping in the basin that has created the groundwater depressions that is assumed to result in theco-mingling of good quality and lesser quality water throughout the basin, similar to the Proposed Project. The increased pumping from this alternative, however, is a very small fraction of the total pumping from the basin that has created the groundwater depression. Thus, the contribution of this alternative to the change in water quality is miniscule and cannot be quantified, measured, or monitored. While it may be possible to mitigate for this impact at individual wells by adjusting the depth of the well screen or using wellhead treatment, it is not possible to mitigate for this impact in the intervening aquifer. It is important to note that this impact on the aquifer would occur whether or not this alternative is implemented. In fact, even if all of the pumping by IWVWD was to cease, more groundwater would still be pumped from the basin than is being recharged.

Groundwater depressions would still persist and lower-quality groundwater would continue to co-mingle with higher-quality groundwater. As discussed in Section 3.8, the average groundwater pumping from the basin over the last 30 years has been about 26,000 acre-feet per year. Over the same time period, the average pumping by IWVWD (including the entities acquired in the 1980s) has been about 8,000 acre-feet per year. Thus, non-IWVWD pumping has averaged 18,000 acre-feet per year, while the annual recharge is between 8,000 acre-feet and 11,000 acre-feet. Therefore, the non-IWVWD pumping exceeds the recharge rate by 7,000 acre-feet per year to 10,000 acre-feet per year. The minor incremental increase in pumping that may occur with this alternative is nominal in comparison to the non-IWVWD pumping. On a Project-specific basis, similar to the Proposed Project, this impact is less than significant. On a cumulative basis, this impact is significant, unavoidable, and unmitigable, similar to the Proposed Project.

As stated above and in Section 3.8, the existing baseline environmental conditions include a significant water quality situation. Therefore, the significant impact exists with or without the implementation of this alternative and unavoidable cumulative impacts to groundwater quality would occur. To be clear, these impacts would occur in the absence of this alternative and it is not possible to quantify, measure, or monitor the potential nominal contribution from the alternative. Therefore, this potential cumulative impact is unmitigable and would persist with or without the implementation of the alternative.

Noise. Noise impacts would be similar to the Proposed Project, because Alternative 3 involves construction of a booster station and improvements to existing wells. As with the Proposed

Project, this alternative would not result in significant impacts. However, mitigation measures were recommended in order to reduce the construction noise levels to the extent practicable and help minimize the potential annoyance at nearby sensitive receivers. These mitigation measures would also apply to this alternative.

4.3.4 Alternative 4 – Phase 1 Only

With this alternative, only Phase 1 (improvements to existing wells 18 and 34) would be constructed, allowing an additional nominal pumping capacity of 2,000 gpm, which would be available during maximum demand days (Table 4.3-4). If the maximum daily demand with a 20 percent safety factor could not be reliably met, which is anticipated to occur by 2015, then the existing Water Shortage Contingency Plan and other measures described in the Urban Water Management Plan (IWVWD 2011) would be enacted (see Section 4.2.2).

This alternative would avoid the significant cumulative impact to water quality identified with the Proposed Project, but would not meet two of the three project objectives. It would not provide a cost-effective, safe and reliable source of domestic water supply for the IWVWD's customers and would not meet the IWVWD's current and future water production requirements, including increases in domestic water demand resulting from projected population increases of approximately 1 percent per year in Kern County and no additional connections in San Bernardino County. It would provide a 20 percent system redundancy to ensure water supply to IWVWD's customers during maximum pumping days, but only in the very short term (until 2015). In the long-term, project objectives would not be met.

Table 4.3-4
IWVWD Domestic Water System
Nominal Capacity of Well Pumping Plants Compared to Maximum Day Demand (plus 20% Safety Factor), With Alternative 4
(values in gpm)

WELL	PHASE	
	Phase 1 (2012)	Phase 2 (2015)
9A	1,000	1,000
10	1,100	1,100
11	1,000	1,000
13	1,100	1,100
17	1,200	1,200
30	1,400	1,400
31	1,200	1,200
18	2,200	2,200
33	1,200	1,200
34	2,200	2,200
NOMINAL CAPACITY	**13,600**	**13,600**
PRODUCTION DEMAND (max day plus 20% safety factor)	**13,960**	**14,350**
PRODUCTION CAPACITY (NEED) SURPLUS	**(360)**	**(750)**

4.3.4.1 Impacts

Air Quality. With this alternative, air quality impacts would be associated with the construction and operation of the improvements to Wells 18 and 34. Although this alternative would still contribute to air emissions, air quality impacts would less than those described for the Proposed Project. Impacts would be less than significant.

Biological Resources. Impacts associated with this alternative would be less than those described for the Proposed Project, because no ground disturbing activities would occur. Impacts would be less than significant, and no mitigation measures would be required.

Cultural and Paleontological Resources. Impacts associated with this alternative would be less than those described for the Proposed Project because no ground-disturbing impacts would occur. No mitigation measures would be required.

Geology and Soils. Impacts to geology and soils would be less than the Proposed Project, because no ground-disturbing impacts would occur. No mitigation measures would be required.

Greenhouse Gas Emissions. Greenhouse gas emissions would be less than the Proposed Project, because fewer construction activities are proposed. A less than significant impact would occur.

Hazards and Hazardous Materials. Impacts would be similar to the Proposed Project and would be less than significant.

Hydrology and Water Quality. Project-level impacts to hydrology and water quality would be similar to those described for the Proposed Project, and would be less than significant with mitigation with this alternative. The potential impacts of the Proposed Project on hydrology and water quality are discussed in detail in Section 3.8. This alternative would avoid the District's contribution to the significant, cumulative impact to water quality because increased pumping associated with Phase 2 would not occur. However, the existing baseline environmental conditions include a significant water quality situation. Therefore, the significant impact exists with or without the implementation of this alternative and impacts to groundwater quality would still occur. To be clear, these impacts would occur even with this alternative, although the District's contribution from the Proposed Project would be eliminated.

Noise. Noise impacts would be less than the Proposed Project, and would be less than significant.

4.3.5 No Project Alternative

4.3.5.1 Description

CEQA requires that the No Project Alternative be analyzed in an EIR. In accordance with Section 15126.6(e)(3)(B), the No Project Alternative consists of an analysis of the circumstance under which the project does not proceed. With the No Project Alternative, existing pumping rates at the existing wells would be continued. No well improvements would be made, no additional wells would be constructed, and no water would be transferred from NAWS China Lake, except

for under catastrophic emergency circumstances. The existing connections with Searles Valley Minerals and NAWS China Lake would continue to be available for catastrophic emergencies.

If demand could not be reliably met, then the existing Water Shortage Contingency Plan and other measures described in the Urban Water Management Plan (IWVWD 2011) would be enacted (see Section 4.2.2).

The No Project Alternative would not meet any of the objectives of the Proposed Project or the IWVWD Water General Plan or Urban Water Management Plan. It would not provide a cost-effective, safe and reliable source of domestic water supply for the IWVWD's customers; would not provide a 20 percent system redundancy to ensure water supply to IWVWD's customers during maximum pumping days; and would not meet the IWVWD's current and future water production requirements, including increases in domestic water demand resulting from projected population increases of approximately 1 percent per year in Kern County and no additional connections in San Bernardino County.

4.3.5.2 Impacts

Air Quality. With this alternative, the air quality impacts associated with the Proposed Project would not occur because the construction and operation of the components of the Proposed Project would not occur.

Biological Resources. Impacts associated with the construction of Well 35 would not occur.

Cultural and Paleontological Resources. Impacts associated with construction of Well 35 would not occur.

Geology and Soils. Impacts to geology and soils associated with ground-disturbing activities would not occur.

Greenhouse Gas Emissions. Greenhouse gas emissions would not occur because the construction and operation of the components of the Proposed Project would not occur.

Hazards and Hazardous Materials. No impacts would occur, because no new wells would be constructed and existing wells would continue operations as with current conditions.

Hydrology and Water Quality. Project-level impacts to hydrology and water quality would be avoided. The increased pumping would not occur, and the District's portion of the significant, unavoidable impact would be avoided. However, the existing baseline environmental conditions include a significant water quality situation. Therefore, the significant impact exists with or without the implementation of this alternative and impacts to groundwater quality would occur even with this alternative, although the District's contribution from the Proposed Project would be eliminated.

Noise. With this Alternative, no construction would take place and no new operational noise sources would be introduced. Therefore, there would be no noise impacts from the No Project Alternative.

4.4 COMPARISON OF ALTERNATIVES

Table 4.4-1 provides a comparison of the anticipated impacts of the alternatives to the Proposed Project with the Proposed Project.

Table 4.4-1
Comparison of Alternatives with Proposed Project

Category	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 (No Project)
Air Quality	O	O	O	-	-
Biological Resources	O	O	O	-	-
Cultural and Paleontological Resources	O	O	O	-	-
Geology and Soils	O	O	O	-	-
Greenhouse Gas Emissions	O	O	O	-	-
Hazards and Hazardous Materials	O	O	O	-	-
Hydrology and Water Quality	+	+	O	-	-
Noise	O	O	O	-	-

Notes: + = Impacts would be greater than the Proposed Project
O = Impacts would be the same as the Proposed Project
- = Impacts would be less than the Proposed Project

4.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA Guidelines Section 15126.6(e)(2) requires that the EIR identify the environmentally superior alternative. If that alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. For the WSIP, the environmentally superior alternative is the No Project Alternative, because that alternative would avoid all impacts associated with the Proposed Project, including the significant, unmitigable impact to water quality. Alternatives 1 and2 would have similar impacts to the Proposed Project, with the exception of water supply. Both of these alternatives would have greater water supply impacts than with the Proposed Project; however, these impacts could be mitigated. With these alternatives, all impacts would be less than significant or less than significant with mitigation with the exception of water quality. An unmitigable, cumulative impact to water quality would occur with all of these alternatives. Alternative 4 would avoid the ground-disturbing impacts associated with the construction of new Well 35 and would avoid the District's contribution to water quality impacts in the Indian Wells Basin related to the Proposed Project. However, Alternative 4 would not achieve the majority of the project objectives. Therefore, the Proposed Project has been selected as the environmentally superior alternative that would also meet project objectives.

4.6 ALTERNATIVES CONSIDERED BUT REJECTED

4.6.1 Construction of New Wells on NAWS China Lake

During the planning process for the Proposed Project, seven alternative scenarios were evaluated and modeled (including the No Project Alternative). Another alternative that included transfer of water from existing Navy wells was later added. Of these alternatives, Scenario 6 was chosen as the Proposed Project. Three alternatives, Scenarios 1, 2, and 3 involved construction of two new wells in the southwest corner of NAWS China Lake and improvements to existing IWVWD wells. Subsequent meetings with the Navy in 2010 have indicated that the Navy's process for evaluating this alternative is likely to take many years with no guarantee of approval. The Navy's approval process requires the construction of monitoring wells to gather additional data over a period of several years to evaluate the water resource prior to further discussions regarding this alternative. Therefore, if the new wells were not approved, the alternative would consist only of improvements to existing IWVWD wells, and would be substantially similar to Alternative 4, which was retained for analysis. Therefore, this alternative was rejected because another similar alternative within the range of reasonable alternatives was analyzed.

4.6.2 Additional Water Conservation Alternative

The current water conservation methods employed by the IWVWD are listed in Section 4.2.2, and are included in all alternatives, including the No Project Alternative. These methods include a conservation-based rate structure, conservation education, conservation measures, and conservation regulations. The District's UWMP has calculated that its baseline water use is approximately 264 gallons per capita per day (GPCD). The District is required by the California Water Code (Section 10608.20) to have a 20 percent reduction from the baseline daily per capita water use by December 31, 2020. The District must meet a midpoint target between the baseline and the 2020 target by December 31, 2015. The UWMP has determined water use targets of 239 GPCD by December 31, 2015 and 214 GPCD by December 31, 2020 (IWVWD 2011).

The District currently practices comprehensive conservation Best Management Practices (BMPs) developed by the California Urban Water Conservation Council. The California Urban Water Conservation Council was created to increase efficient water use statewide through partnerships among urban water agencies, public interest organizations, and private entities. The Council's goal is to integrate urban water conservation Best Management Practices into the planning and management of California's water resources.

A Memorandum of Understanding was signed by nearly 100 urban water agencies and environmental groups in December 1991. Since then the Council has grown to 389 members. Those signing the MOU, including the IWVWD, pledge to develop and implement operational and education conservation BMPs. The District has implemented or is on schedule to implement all of the BMPs that are feasible and has applied for waivers for those BMPs that are not feasible within the District.

An Additional Water Conservation Alternative would reduce water use through conservation by an additional amount above the 20 percent reduction required by the California Water Code.

Because the 20 percent safety factor is not currently being met, Phase 1 would still be implemented. However, implementing more aggressive conservation measures that go beyond current BMPs as a means to meet future water demands may mean that Phase 2 is not triggered. The IWVWD would implement new restrictions on water use, such as limitations on residential landscape irrigations, washing vehicles, etc., and have appropriate penalties for failure to comply with restrictions.

This alternative would avoid the District's contribution to the significant cumulative impact to water quality associated with Phase 2 of the Proposed Project. However, it would not eliminate the overall cumulative impact to water quality in the basin, which would occur even if all of the District's pumping were eliminated. Additionally, it would not meet most of the Project objectives. The Additional Water Conservation Alternative would not provide a cost-effective, safe and reliable source of domestic water supply for the IWVWD's customers or meet the IWVWD's current and future water production requirements, including increases in domestic water demand resulting from projected population increases of approximately 1 percent per year in Kern County and no additional connections in San Bernardino County. Conservation programs defer or limit the rate of demand for water. However, these programs cannot reliably supply water in the long-term. Finally, an alternative that would implement only Phase 1 has been considered in this EIR.

4.6.3 Developing Supplemental Water Supply Alternative

The IWVWD Water Supply Enhancement General Plan (IWVWD 2007) has identified several areas of study to develop supplemental water supply. These areas of study are summarized below.

4.6.3.1 Inside the Indian Wells Valley

Additional Storage. This alternative would include the construction of additional storage tanks to provide supplemental water supply during equipment outages on maximum demand days. Water would be pumped during the cooler months and stored for use during the summer. This alternative would not avoid the significant, cumulative water quality impact because it would still require additional pumping from the groundwater basin. Although it would technically be possible to provide a 20 percent redundancy for the near term (2012), this alternative would not meet the IWVWD's current and future water production requirements, including increases in domestic water demand from projected population increases of approximately 1 percent per year in Kern County and no additional connections in San Bernardino County. Additionally, this alternative would not provide a cost-effective, safe, and reliable source of domestic water supply for the IWVWD's customers because the large tanks that would be required (approximately 8.4 million gallons of storage for a 7 day supply) would not only be costly (approximately $10.5 million), but the water stored inside would be subject to stagnation and other water quality problems.

Groundwater Treatment and Blending. The IWVWD considered the treatment and blending of poorer quality groundwater with good quality groundwater to extend the useful life of the groundwater aquifer and avoid or minimize treatment costs. While this blending process would not increase the total quantity of groundwater available, it could extend the useful life of the groundwater presently available in the valley. The District conducted pilot testing for

brackish water desalination from the Northwest Well Field (NWWF) from June 2008 to June 2009 (Carollo Engineers 2010). The groundwater from the NWWF was originally used for irrigation and cannot be used for drinking water without treatment. The treatment of brackish groundwater could allow the IWVWD to increase capacity while using the existing resources in the Indian Wells Valley. A pilot facility was housed in a temporary building constructed adjacent to Well 1 in the NWWF. The pilot facility was operated for a seven-month period. The process produced a high-quality product, removing 90 percent of the total dissolved solids. All treated water goals were met, with the exception of boron. Boron is not regulated, and there is no maximum contaminant limit. However, the California Department of Public Health has set a notification level of 1 mg/L for boron. The boron concentration after treatment was 1.4 mg/L; thus, the IWVWD would either need to provide notification that this limit has been exceeded, provide additional treatment to further remove boron, or blend the water with water from the District's potable wells to reduce the boron concentration. The pilot study estimated that a brackish groundwater treatment facility could produce approximately 3,000 acre-feet per year (AFY) and cost $46.0 million. Operations and maintenance costs would be approximately $3 million per year. This cost did not include the cost of distribution piping or additional boron treatment. The cost of this alternative, approximately $2,350 per acre-foot, would be more than 20 times the cost of the Proposed Project. The study concluded that the IWVWD benefits from the extra drinking water recovered were not more than the cost of the brine treatment. This is because of the IWVWDs inland location. If ocean disposal of brine were an option, the costs of brine disposal would be approximately half of the cost of a treatment system using a brine concentrator and evaporation ponds (Carollo 2010). Additionally, if the District were to rely on this method of treatment, approximately 30 percent of the District's capacity in 2015 would be lost if there were a failure in the plant. Therefore, this alternative does not meet the Project objective of a cost-effective, safe, and reliable source of domestic water supply for the IWVWD's customers.

Reclaimed or Recycled Water. The IWVWD has the legal authority to accept, treat, and deliver wastewater effluent as recycled water. The IWVWD does not currently have access to wastewater effluent for recycling. Such water is currently under the jurisdiction of the City of Ridgecrest. Presently, all treated wastewater is being used by the City of Ridgecrest and the Navy and there is no surplus water available for the IWVWD (IWVWD 2011). Therefore, this alternative would not meet any of the Project objectives. It would not provide a reliable source of domestic water supply, it would not provide a 20 percent system redundancy, and would not meet IWVWD's current and future water production requirements.

4.6.3.2 Outside of the Indian Wells Valley

The following summarizes potential sources of supplemental water from outside of the valley.

Import from Other IWVWD Properties. With this alternative, the District would import water from existing and potential future District-owned properties located outside of the Indian Wells Valley. Such water would be transported via the Los Angeles Aqueduct and deposited into a recharge facility located within the Indian Wells Valley. Costs would include property acquisition and the construction of transmission and recharge facilities. Approximately 2,200 acre-feet of water per year could be produced with this alternative at an estimated cost of $800 to $1,100 per acre-foot, not including the cost to extract and deliver the water from the in-valley storage facility. This alternative would not be able to be constructed within the time

frame of the Proposed Project. Because the project could not be constructed prior to 2015, the project objective of meeting existing and future demand with a 20 percent redundancy would not be met.

Other Local Public and Private: The IWVWD occasionally receives information that indicates supplemental water may be available on a relatively local basis. The IWVWD has had discussions with Kern County Water Agency regarding short-term and long-term water acquisitions, exchanges, and transfers. The IWVWD has included one alternative with a supplemental water source from existing NAWS China Lake wells. Additionally, emergency supply from NAWS China Lake is included in the No Project Alternative. The IWVWD currently has an interconnection with Searles Valley Minerals. This interconnection, which supplies water during emergencies, is also included in the No Project Alternative. Therefore, a range of supplemental water alternatives from local water sources has been considered in this EIR.

State Water Project: With this alternative, the IWVWD would purchase water from a person or company that already has an entitlement in the State Water Project (SWP) system, but doesn't need some or all of the SWP water for a period of time. The purchased water would be exchanged with the Los Angeles County Department of Water and Power (LADWP) for water from the Los Angeles Aqueduct. IWVWD would purchase the unused water and pay the cost to convey the water from the point of acquisition (to be determined by the LADWP) to the point of delivery (a storage facility in the Indian Wells Valley). This type of arrangement may be interruptible depending on the needs and requirements of the entitlement holder. Variances in available water supply could also occur in dry years, because of State legislation, oversubscription, commitments of water for environmental purposes such as habitat for the delta smelt, and other reasons. Finally, the identification of entitlements, negotiation of purchase, and construction of delivery infrastructure is estimated to take longer than the WSIP project horizon of 2015. Therefore, this alternative would not meet the project objective of a reliable source of domestic water supply. Because the project could not be constructed prior to 2015, the project objective of meeting future demand with a 20 percent redundancy would also not be met.

City of Los Angeles: The Los Angeles Aqueduct (owned and operated by the City of Los Angeles) traverses the west boundary of the Indian Wells Valley. This alternative would require the IWVWD to purchase water directly from LADWP and construct a pipeline and other conveyance the approximately 6 miles from the aqueduct to a new storage facility, likely in the southwest wellfield. During the last two decades, Inyo County and the City of Los Angeles have negotiated legal agreements that allow for joint management of water and land in the Owens Valley. These agreements, including the Inyo-Los Angeles Water Agreement (Inyo County and City of Los Angeles 1991) and a 1997 Memorandum of Understanding between the City of Los Angeles, Inyo County, the Owens Valley Committee, the Sierra Club, the California Department of Fish and Game, and the State Lands Commission (City of Los Angeles *et. al* 1997), have led to monitoring of groundwater-dependent vegetation in the Owens Valley and joint projects for saltcedar control, revegetation of LADWP areas damaged by previous management, mitigation of environmental damage in some areas by revegetating others, recovery of drought-damaged areas, rewatering a 60-mile stretch of the lower Owens River that was diverted to the first Los Angeles aqueduct in 1913, and monitoring of and reporting on the condition of natural resources in or on LADWP-owned lands. In the last decade environmental considerations have required that LADWP reallocate approximately one-half of

the Los Angeles Aqueduct water supply to environmental mitigation and enhancement projects. As a result, approximately 205,800 acre-feet of water supplies for environmental mitigation and enhancement in the Owens Valley and Mono Basin regions were used in 2010, which is in addition to the almost 107,300 acre-feet per year supplied for agricultural, stockwater, and Native American Reservations. Reducing water deliveries to LADWP from the Los Angeles Aqueduct has led to increased dependence on imported water supplies (LADWP 2011). Therefore, LADWP does not have excess water for purchase by IWVWD, and any water from LADWP would need to be obtained by purchasing water from an existing entity with SWP entitlements and exchanging that water with LADWP, as described in the previous section.

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