Environmental Assessment
for
Spanish Springs Nitrate Remediation Pilot Project Phase III
Washoe County, Nevada

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U.S. Environmental Protection Agency
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Section 1: PURPOSE AND NEED FOR ACTION

1.1 Introduction

The municipal water supply wells in Spanish Springs Valley have shown increasing nitrate concentrations over the last fifteen years of monitoring. In 1996, Ralph Seiler with the USGS authored a report that identified residential septic systems as the source of elevated nitrate concentrations in the Spanish Springs Valley municipal wells. In April 2000, the Nevada Division of Environmental Protection, Bureau of Water Pollution Control (NDEP) directed the Washoe County Department of Water Resources (WCDWR) to expand community sewer service to the Spanish Springs area. The NDEP indicated that the "continued release to the ground-water via Individual Sewage Disposal Systems (ISDS) is not allowable where the water supply is impacted."

In 2002, preliminary hydro geologic investigations were conducted by WCDWR to characterize the extent of the nitrate contamination. The initial phase of the investigation, conducted under a grant from the Regional Water Planning Commission, included installation of shallow monitoring wells and groundwater sampling. Groundwater samples collected from all ten of the shallow monitoring wells showed concentrations of nitrate as nitrogen (nitrate-N) above the US Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) of 10 milligram per liter (mg/L), with concentrations as high as 31 mg/L. Additional monitoring well installations and sampling was completed as part of the second phase of the Nitrate Remediation Pilot Project, conducted under a grant from the EPA. Samples collected in 2004 showed that concentrations of nitrate-N had increased in the initial set of monitoring wells to as high as 38 mg/L. Sampling during the second quarter of 2009 showed that concentrations of nitrate-N in the shallow groundwater increased to 110 mg/L.

Phase III (the Proposed Action) of the Nitrate Remediation Pilot Project aims to remediate groundwater in the vicinity of DS#4 and DS#3 and put infrastructure back into use.

1.2 Project Location and Study Area

The Proposed Action (Project) is located in the 80.1 square mile Spanish Springs Hydrographic Basin, about 8 miles northeast of the Reno-Sparks metropolitan area. The 8 square mile Study Area is located near the center of the basin and encompasses the population center with homes built between 1979 to present. Figures 1 and 2 depict the Location and Project Area.

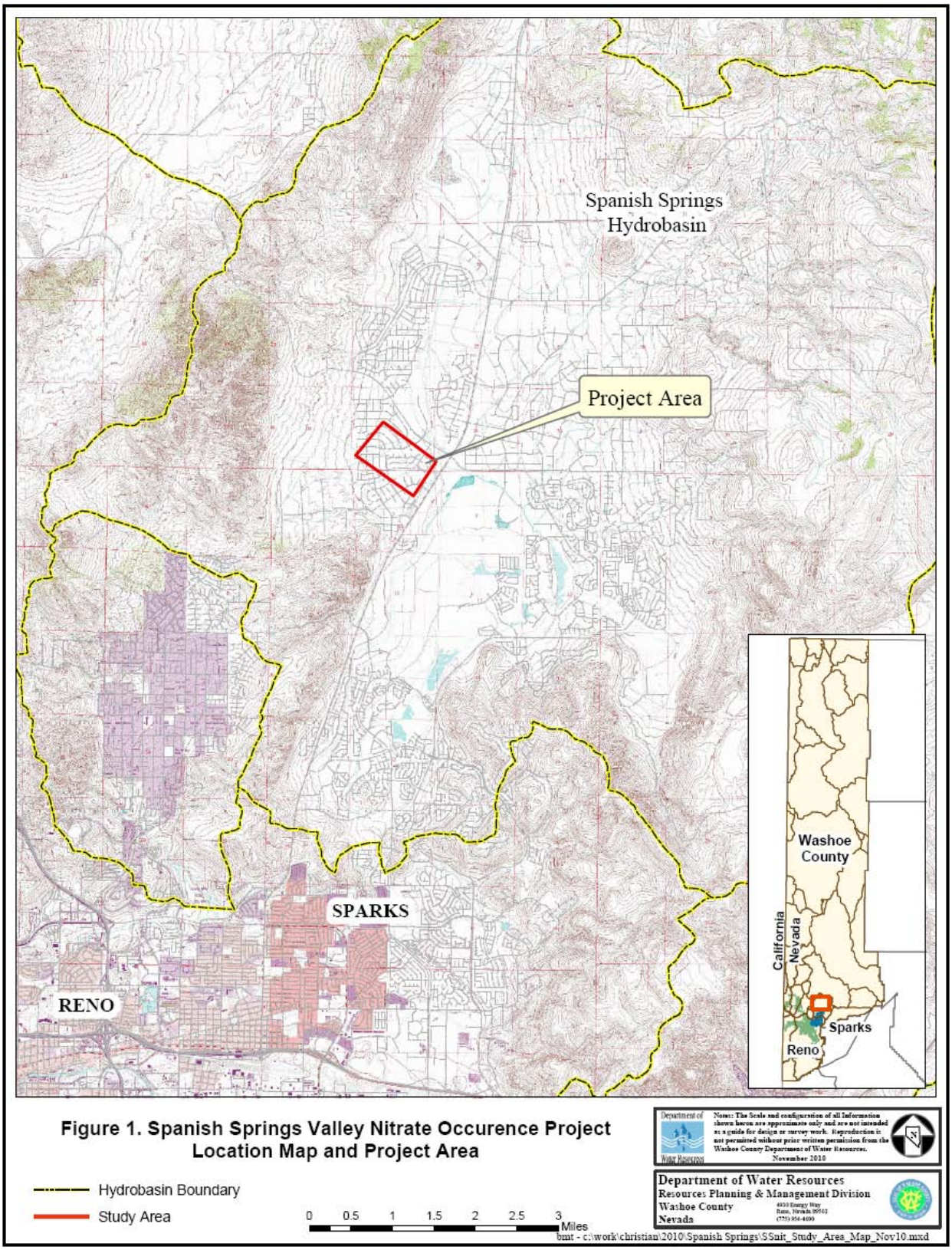

Figure 1: Location and Project Area Map

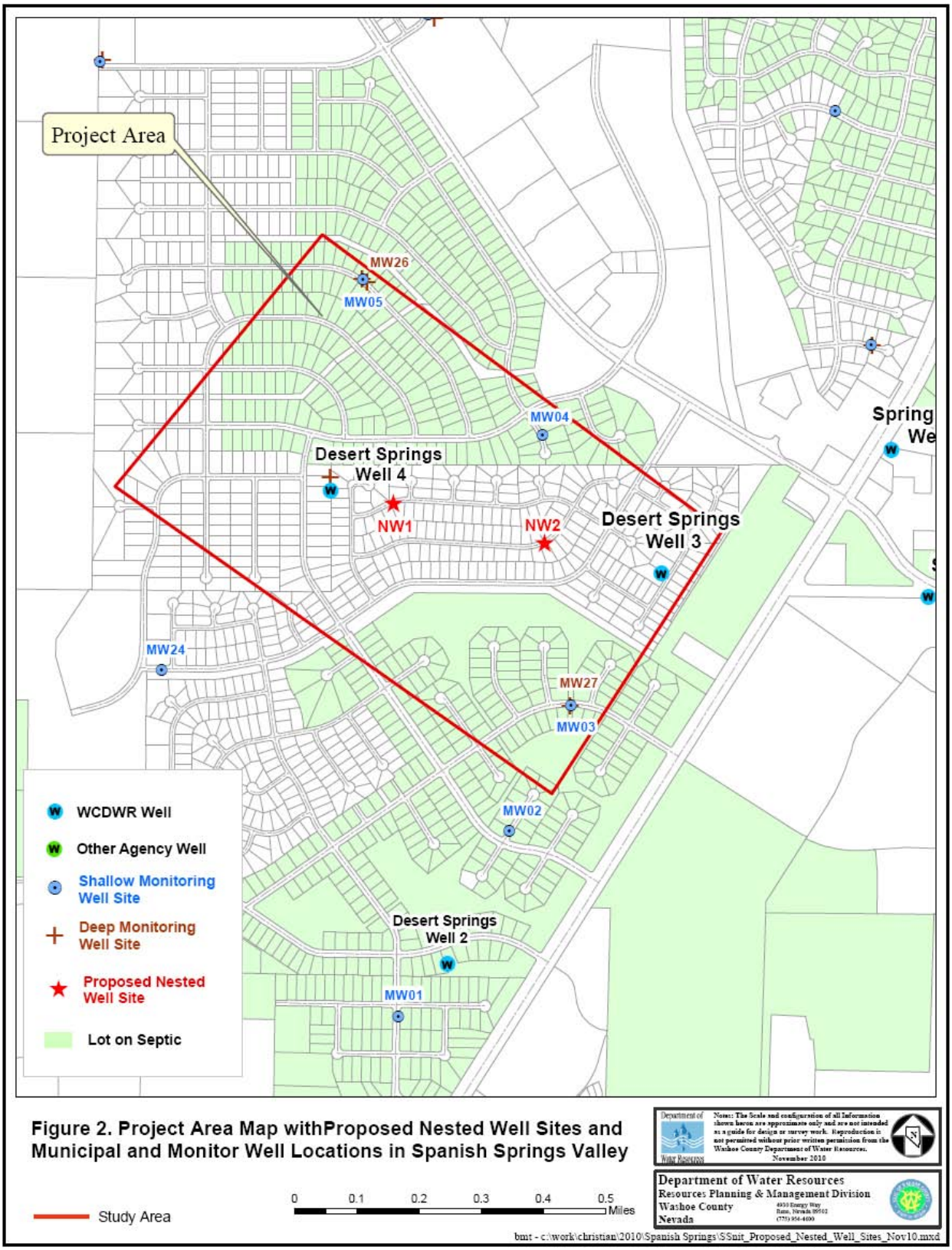

Figure 2: Project Area Map

1.3 Purpose and Need for Proposed Action

WCDWR has suspended use of Desert Springs Wells #3 and #4 (DS#3 and DS#4, respectively) due to nitrate-N and arsenic concentrations in excess of the MCL. To mitigate this loss of supply, WCDWR contracted with the Truckee Meadows Water Authority (TMWA) to purchase replacement water on a wholesale basis. While the purchase of wholesale water allows WCDWR to suspend the use of DS#3 and DS#4 in the near-term, these wells, and the local groundwater aquifer, will be needed to meet peak summer demands as the region continues to grow and water demands increase.

WCDWR developed a water quality management plan to actively manage the aquifer to continue to provide potable water to the residents of Spanish Springs Valley. The ultimate goal is to convert septic systems in the vicinity of the impacted groundwater to a municipal sewer system. However, this very costly process may take a decade or more to complete. Until the conversion is completed, additional nitrate will be discharged to the aquifer from septic systems, adding to the significant mass of nitrate already present in the aquifer. In addition, urbanization (where native desert vegetation is replaced with homes and irrigated turf) is expected to continue. Urbanization can lead to increased recharge from irrigated lawns, which in turn mobilizes naturally-occurring nitrate in the unsaturated zone, transporting it to groundwater. It is estimated that around 10-20% of the nitrate in groundwater in the Valley is from naturally-occurring sources.

The long-term solution to the nitrate problem is to convert septic systems to municipal sewer, thereby removing the largest source of nitrate in the Valley. Ten percent of the septic systems in the highly-impacted area in the center of the Valley have already been converted to sewers. Recently, funding was acquired that will allow for an additional 10% of septic to be converted to sewer. WCDWR is continually searching for funding to convert septic to sewer, and will continue until the majority of septic systems in the center of the Valley have been converted. In addition, there has been a moratorium on high-density septic systems in the Valley since the late 1990's.

The long-term solution to naturally-occurring nitrate in the Valley is addressed through various methods. The impact of naturally-occurring nitrate is reduced by domestic and municipal irrigation management, whereby watering days, times, and application rates are recommended by water managers and scientists through public education (www.washoeet.dri.edu). In addition, naturally-occurring nitrate has been reduced by avoiding construction of rapid infiltration basins in the Valley.

This Phase III of the Project proposes several management and engineering control measures to remediate the groundwater quality with respect to nitrate. Specifically, Phase III will include groundwater extraction from DS#3, the well with the highest nitrate-N concentrations (removes nitrate from the aquifer), groundwater injection into DS#4 with low nitrate water (dilutes concentrations of nitrate as wells as controls transport), and monitoring to verify effectiveness of the activities. These project elements, coupled with the continued conversion of septic to a municipal sewer system, were selected because of the anticipated benefit of returning the aquifer to a usable state for domestic water production.

1.4 Scope of the Environmental Assessment

The purpose of this Environmental Assessment is to document and make public the potential direct, indirect, and cumulative environmental impacts that may arise from the implementation of the Proposed Action or the No Action alternative considered by WCDWR to improve potable water in Spanish Springs Valley, Nevada. The scope of this EA is limited to the environmental resources and services within the area of interest that may be affected by the no action alternative or the Proposed Action.

Seection 2: DESCRIPTION OF PROPOSED ACTION & NO ACTION ALTERNATIVE

Currently, high nitrate concentrations in groundwater from high density septic systems results in reduced service and poor water quality. The Proposed Action would fulfill the goal of improving potable water quality by removing a significant mass of nitrate from the groundwater through injection of potable water and groundwater extraction using the existing potable water system. The No Action alternative would allow nitrate to accumulate in groundwater and continue to deteriorate the resource while leaving infrastructure out of service.

2.1 Alternatives Evaluated

Two alternatives are considered for this project:

Alternative 1 (Preferred Alternative): Converting DS#4 into an injection well and putting DS#3 back into service now that it has been connected to the TMWA wholesale water line where water will be blended to meet water quality standards. The injection at DS#4 and extraction at DS#3 will reduce contaminants in the aquifer over time, resulting in an estimated 10,000 pounds of nitrate-N removed over the project period.

Alternative 2 (No Action Alternative): No improvements to the potable water distribution system in Spanish Springs Valley, Nevada would be applied. Water quality in the aquifer would continue to degrade as nitrate accumulates in the aquifer and infrastructure that the community has already paid for will remain non-operational.

2.2 Alternative 1: Nitrate Remediation through Injection and Extraction

This alternative proposes placing DS#3 back into operation now that it has been connected to a wholesale potable water blending line. This will allow for nitrate to be removed from the aquifer while continuing to provide water that meets all Safe Drinking Water Act (SDWA) requirements for quality.

No construction activities are required at DS#3 to initiate pumping. However, several new valves and a water level transducer are required to monitor the volume and quality of water being extracted at DS#3.

No construction activities are required at DS#4 to initiate injection of potable water. However, several new valves, some down hole piping, and mechanical equipment will be required to monitor the volume and quality of water being injected at DS#4. The well screens will be inspected for flow potential and may be required to be rehabilitated.

Two sets of monitoring wells will be constructed to monitor the effectiveness of the remedial effort. Two new monitoring well sites will consist of two wells each; one well screened across the water table surface and a second well screened approximately 80 to 100 feet below the water table surface. Each well will be constructed using appropriate drilling techniques for the geologic materials present; consist of 2” PVC casing; 2” 0.020 slot PVC screen; and finished with a 50 foot sanitary seal. Each

monitoring and municipal well will be monitored for water level and potentially conductivity using dedicated down hole equipment. These wells will also be routinely monitored to ensure water quality is improving and that water quality extracted from DS#3 and supplied through the distribution system meets SDWA criteria.

It is estimated that 75 million gallons of water will be injected into DS#4 and an equivalent volume of water will be extracted from DS#3 on an annual basis. This should allow for dilution of nitrate within the aquifer over time and result in an additional 10,000 pounds of nitrate being removed from the aquifer at DS#3 over the three year project period through mostly continuous daily operation.

2.3 Alternative 2: No Action Alternative

The No Action Alternative does not present any corrective actions to address the problem of increasing groundwater contamination and reduced utilization of infrastructure in Spanish Springs Valley, Nevada; this alternative would maintain existing conditions. This alternative would permit continued degradation of the aquifer that may cause additional potable water wells to be removed from operation if the problem remains unchecked. The No Action Alternative provides a baseline condition for comparing the proposed alternatives.

2.4 Identification of the Preferred Alternative

Alternative 1 was selected as the Preferred Alternative for its cost-effectiveness, meeting of the project purpose and need, and overall long-term beneficial impacts to several environmental resources with few negative impacts to few environmental resources.

Section 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes relevant existing environmental conditions for resources potentially affected by the Preferred Alternative and identified alternatives.

This Environmental Assessment analyzes the direct, indirect, and cumulative impacts associated with the improvements to the existing potable water distribution system in the proposed Project Area. As stated previously, the project is designed to improve the groundwater quality and ultimately the quality of water removed from DS#3 and potentially other wells over time. This section describes the scientific and analytic basis for comparisons between the Proposed Action and the No Action Alternative and identifies the probable consequences (i.e., impacts, effects), both beneficial and adverse, of each alternative on selected environmental resources.

3.1 Air Quality

3.1.1 Existing Local Air Quality

Spanish Springs, Nevada is not located in a non-attainment area.

3.1.2 Environmental Consequences

Proposed Action

There are no anticipated environmental consequences from the Proposed Action with respect to Local Air Quality.

No Action

There are no anticipated environmental consequences from No Action with respect to Local Air Quality.

3.2 Noise

3.2.1 Existing Local Noise

The noise environment in Spanish Springs, where the project is located, is characteristic of low- to medium-density residential areas where vehicular traffic (largely generated from through traffic on Pyramid Lake Highway is the primary generator of noise.

3.2.2 Environmental Consequences

Proposed Action

Noise will be increased temporarily for approximately 3-4 days during drilling and installation of the four monitoring wells. After installation, noise levels will return to pre-installation levels.

No Action

There are no anticipated environmental consequences from No Action with respect to Local Noise Quality.

3.3 Surface Water Resources

3.3.1 Existing Local Surface Water Resources

It is estimated that around 8 in of precipitation falls each year on the valley floor and has an insignificant impact on groundwater recharge (Berger et al., 1997). Little natural surface water flows in the valley, as prolonged storm events occur infrequently. Being a closed basin with no natural surface outflow, intermittent surface waters collect in the southern portion of the Valley and eventually evaporate or infiltrate. There are no natural perennial streams within the Valley.

The Orr Ditch has been importing Truckee River water to the Valley since 1878 for agricultural use; which, in turn supplements groundwater recharge (Berger et al., 1997). Orr Ditch water returns to the Truckee River through the North Truckee Drain. It originates within the south-central portion of the valley and transmits unused irrigation water and possibly groundwater discharge south to the Truckee River (Berger et al., 1997). Irrigation watering demands are greatest in the summer months from April through September, and drops off from October to March when flows are restricted to lower-flow stock-watering demands (Berger et al, 1997).

3.3.2 Environmental Consequences

Proposed Action

There are no anticipated environmental consequences from the Proposed Action with respect to Surface Water Resources as water that is injected is expected to be removed through pumping at DS#3.

No Action

There are no anticipated environmental consequences from No Action with respect to Surface Water Resources.

3.4 Groundwater Resources

3.4.1 Existing Local Groundwater Resources

The public water systems operating in the Spanish Springs Valley currently meet the MCLs established by the SDWA. The following is a discussion of the water resources available in the Spanish Springs Valley in terms of quality and existing drinking water regulations.

The groundwater in the Project Area contains elevated levels of nitrate. Based on work conducted in Phase II of the Project, 10-25% of the nitrate found in groundwater is due to naturally-occurring nitrate. This nitrate is potentially released from storage in the vadose zone and transported to groundwater due to domestic and municipal landscape over-irrigation.

Compounding these problems, water quality in this area has deteriorated due to discharge from individual sewage disposal systems (Seiler, 1999). The Desert Springs and Spring Creek Wells No.2 and No.3 draw water from this portion of the valley. The historic water quality data from these wells has shown that the highest concentrations of nitrate occur in the shallow aquifer zones while arsenic concentrations generally increase with depth.

The trend of increasing nitrate concentrations in some of the public water supply wells in the Spanish Springs Valley has generated a great deal of concern by the Nevada Division of Environmental Protection. The current drinking water standard for nitrate-N is 10 mg/L. Four of the nine groundwater production wells have been measured at concentrations between 5-10 mg/L N03-N. A 1999 doctoral dissertation by Ralph L. Seiler of the USGS concludes that of the five County wells that experience nitrate contamination four are contaminated due to wastewater contamination.

3.4.2 Environmental Consequences

Proposed Action

It is anticipated that over time, the injection of potable water up gradient of the area with high nitrate concentrations in the Project Area will result in reduced concentrations of nitrate in the aquifer over time. There is a possibility that concentrations of nitrate will increase for a short period of time as the mound of injected water entrains nitrate migrating from septic to the groundwater. However, this mass of nitrate is already en route to the aquifer. The total mass of nitrate in the aquifer is not increased due to injected water quality, but the rate at which this nitrate reaches the aquifer may be increased temporarily. The potential increase in nitrate will be attenuated and diluted by the large volume of water injected into the aquifer over time (75 million gallons annually). The overall effect of injecting low nitrate potable water will be to dilute the nitrate in groundwater over time. Pumping DS#3 is estimated to remove 10,000 pounds of nitrate from the groundwater over the three year project period.

The mound of water created through groundwater injected at DS#4 will be monitored in DS#4 and surrounding monitoring wells with dedicated water level recording devices to ensure water levels do not get too high. Water levels in the area of DS#4 are in the range of 70 below land surface, allowing enough room for injection activities to occur.

No Action

Groundwater quality will continue to degrade in the Project Area under the No Action alternative as nitrate accumulates in the aquifer over time.

Under the No Action Alternative septic effluent and naturally-occurring nitrates in the soil will continue to degrade the aquifer. Septic systems are being converted to municipal sewer when grant monies are available, and this program is an on-going effort. Naturally-occurring nitrate accounts for less than 25% of the total mass of nitrate in the aquifer. If all septic systems are converted, the mass of nitrate contributed from natural sources is minimal in comparison and not likely to increase nitrate concentrations in the aquifer over the MCL. Currently, landscape irrigation is limited to three days a week. In addition, watering recommendations are in place to tie irrigation rates to local evapotranspiration rates. This helps to ensure that water is used by plants instead of passing through the root zone to the aquifer. Although a landscape ordinance is desirable, the irrigation restrictions and recommended rates are a more efficient means of controlling over-irrigation at this time.

3.5 Wetlands

3.5.1 Existing Local Wetlands

There are no wetlands located within the Project Area.

3.5.2 Environmental Consequences

Proposed Action

Not applicable.

No Action

Not applicable.

3.6 Floodplains

3.6.1 Existing Local Floodplains

There are no floodplains located within the Project Area that would be impacted by construction activities as the monitoring well sites are located outside of the floodplain. Figure 3 depicts the 100-year FEMA floodplain in relation to the Project Area.

3.6.2 Environmental Consequences

Proposed Action

Not applicable.

No Action

Not applicable.

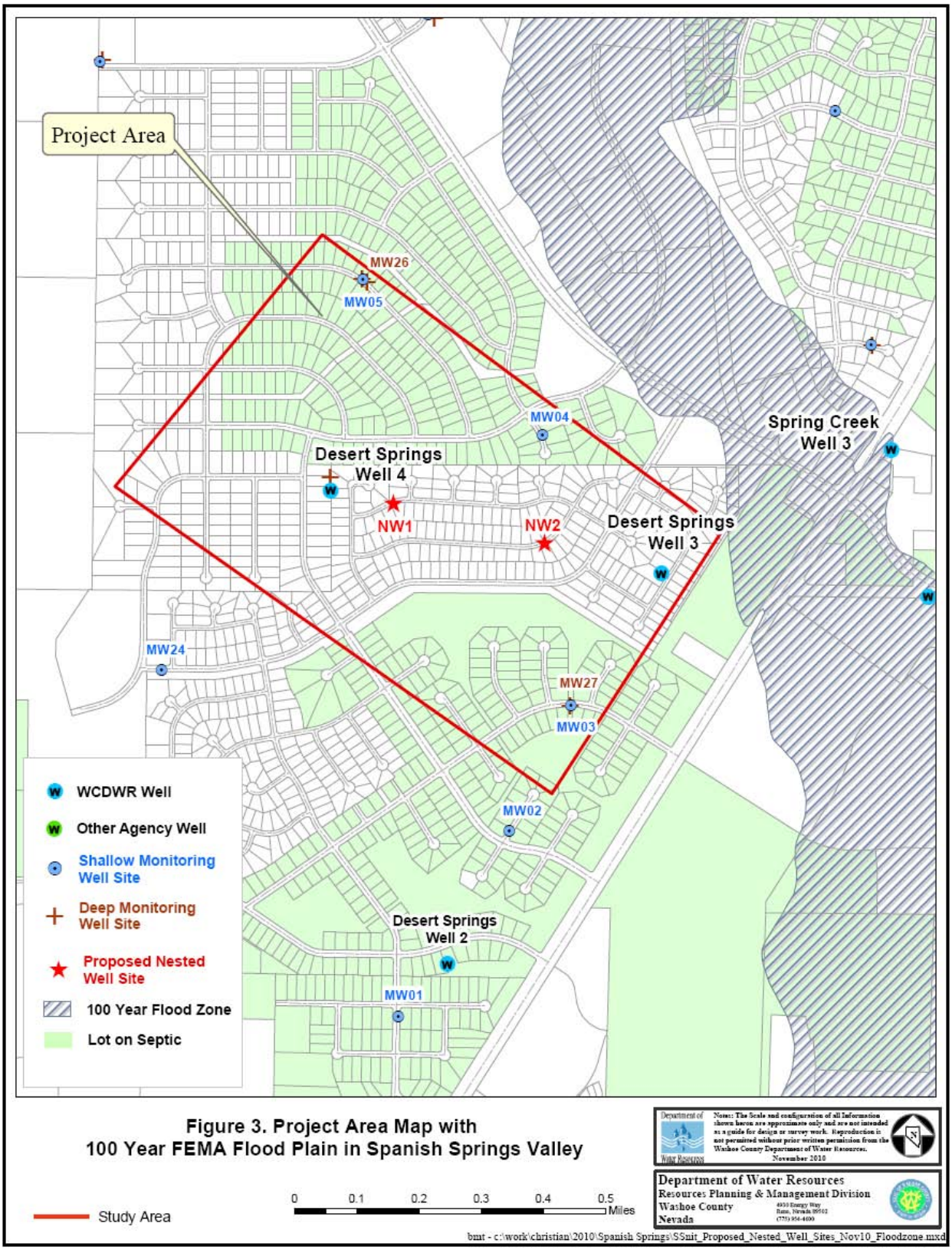

Figure 3: 100-year FEMA Floodplain Map

3.7 Public Health and Safety

3.7.1 Existing Local Public Safety

Public health is a concern when discussing potable water distribution systems especially with respect to water quality. Water quality concerns arising from increasing nitrate concentrations in municipal wells has already been addressed. Wells that have reached the EPA MCL for SDWA constituents have been removed from operation. DS#3, which was previously disconnected from the distribution system, has been connected to a potable water line in order to blend the water and lower the concentrations to below SDWA requirements. The safety of the water quality is ensured through routine water quality monitoring and system maintenance.

3.7.2 Environmental Consequences

Proposed Action

Water from DS#3 will be blended with potable water prior to being served to customers and is estimated to have nitrate concentrations reduced in half, as a result. A rigorous program of water quality assessment has been proposed which will identify water quality trends and allow water system managers to make adjustments to ensure water quality in the system meets SDWA requirements. The four new monitoring wells, a series of existing monitoring wells, municipal wells (DS#4 and DS#3), and water within the distribution system will be monitored to ensure water quality meets all SDWA requirements.

No Action

Wells that do not meet SDWA requirements have been deactivated. If the nitrate in groundwater continues to increase over time, there is the potential that additional wells will be affected and taken out of operation.

3.8 Surface Resources

3.8.1 Topography

3.8.1.1 Local Topographic Setting

The 80.1 square mile Spanish Springs Hydrographic Basin is about 8 miles northeast of the Reno-Sparks metropolitan area (Figure 1). Spanish Springs Valley is bounded on the east by the Pah Rah Range, on the west by Hungry Ridge, by a natural, narrow topographic divide separating Warm Springs Valley to the north, and on the south by a bedrock-dominated low alluvial divide where the Orr Ditch enters and the North Truckee Drain exits the basin (Berger et al., 1997).

Within the Project Area, the land surface slopes gently to the East, and is covered by numerous homes situated on parcels of approximately 0.33 acres in size.

3.8.1.2 Environmental Consequences

Proposed Action

There are no anticipated environmental consequences from the Proposed Action with respect to Topography as all work will be conducted within existing well facilities.

No Action

There are no anticipated environmental consequences from the No Action alternative with respect to Topography.

3.8.2 Soils and Geology

3.8.2.1 Local Soil and Geologic Conditions

The Valley is filled with unconsolidated igneous, volcanic, and met volcanic sediments derived from the surrounding mountains and playa lake deposits (Cochran et al., 1986). The erosional valley fill material consists of clay, silt, fine- to coarse-grained sand, and gravel. The playa lake deposits consist mostly of clay, silt, and fine-grained sand. Coarse fill materials are located near the mountain fronts while finer deposits are located near the center of the valley, coincident with the historical locations of the playa lakes.

Berger et al. (1997) identified five major geologic units in the valley, but segregated them into two general groups based on their hydro geologic properties: (1) basin fill, generally of high porosity and transmissivity, and (2) consolidated rock, generally of low porosity and permeability, except where fractured.

The basin-fill unit, consisting of alluvium from the mountains, comprises the most productive zones of groundwater in the Valley (Harrill, 1973). Lithology of the unconfined valley-fill material includes clay, silt, sand, and gravel. The valley fill is estimated to have a maximum thickness of approximately 1,000 feet along the western boundary of the Valley and thins toward the bedrock outcrops around the valley perimeter (Berger et al., 1997).

3.8.2.2 Environmental Consequences

Proposed Action

There are no anticipated environmental consequences from the Proposed Action with respect to Soil and Geologic Conditions. Although there may be an increase in the saturated thickness of the aquifer due to the injectate mound, this poses no environmental consequence to existing Soil and Geologic Conditions.

No Action

There are no anticipated environmental consequences from the No Action alternative with respect to Soils and Geologic Conditions.

3.9 Vegetation and Terrestrial Wildlife

3.9.1 Existing Vegetation and Terrestrial Wildlife

The Project Area is dominated by suburban homes and roadways. There are no known Federal listed endangered or threatened species or their habitat within the project area. A habitat survey conducted by the U.S. Fish and Wildlife Service confirmed that there is no habitat for the endangered Carson Wandering Skipper within the areas to be disturbed by construction activities. U.S. FWS confirmed through a letter dated July 28, 2010 that formal habitat and Carson wandering skipper surveys do not need to be conducted for the Spanish Springs Valley Nitrate Remediation Program Phase III at any of the project sites because the properties are unlikely to provide the appropriate habitat needs for the Carson wandering skipper due to their small area, previous disturbances from urbanization, or absence of a salt grass understory within the remaining upland sagebrush community.

3.9.2 Environmental Consequences

Proposed Action

There are no anticipated environmental consequences from the Proposed Action with respect to Vegetation and Terrestrial Wildlife as all work will be conducted within existing well facilities.

No Action

There are no anticipated environmental consequences from the No Action alternative with respect to Vegetation and Terrestrial Wildlife.

3.10 Cultural Resources and Historic Property

3.10.1 Existing Cultural Resources and Historic Property

The Project Area is dominated by suburban homes and roadways. According to the Nevada State Historic Preservation Office (SHPO), there are no archaeological sites or historic structures located in the Project Area. The State of Nevada Department of

Cultural Affairs State Historic Preservation Office confirmed in a letter dated April 21, 2010 that the proposed undertaking will not pose an effect to any historic properties.

3.10.2 Environmental Consequences

Proposed Action

Not applicable.

No Action

Not applicable.

3.11 Land Use

3.11.1 Existing Land Use

Land use within the Project Area is dominated by established residential suburban developments located on parcels of 0.33 acres in size, with some limited light commercial at the intersection of La Posada and Eagle Canyon Road. There is little room for additional development within the Project Area.

3.11.2 Environmental Consequences

Proposed Action

There are no anticipated environmental consequences from the Proposed Action with respect to Land Use as all work will be conducted within existing well facilities.

No Action

There are no anticipated environmental consequences from the No Action alternative with respect to Land Use.

3.12 Aesthetics

3.12.1 Existing Aesthetics

Aesthetically, the Project Area takes on the character of a suburban residential development. Homes in the Project Area range in age from 15 to 40 years old.

3.12.2 Environmental Consequences

Proposed Action

There are no anticipated environmental consequences from the Proposed Action with respect to Aesthetics as all work will be conducted within existing well facilities.

No Action

There are no anticipated environmental consequences from the No Action alternative with respect to Aesthetics.

3.13 Socioeconomics and Environmental Justice

3.13.1 Existing Socioeconomics and Environmental Justice

Based on information obtained from the USEPA "EJView" website, 14.3% of the population within the Project Area are considered minority and 6.4% of the population is considered to be below the poverty level. Figure 4 below depicts the area investigated for Socioeconomic concerns.

3.13.2 Environmental Consequences

Proposed Action

There are no anticipated environmental consequences from the Proposed Action with respect to Socioeconomics and Environmental Justice.

No Action

There are no anticipated environmental consequences from the No Action alternative with respect to Socioeconomics and Environmental Justice.

Figure 4: Socioeconomic and Environmental Justice Search Area Map

3.14 Waste Management

3.14.1 Existing Waste Management

Waste management refers primarily to hazardous wastes within the Project Area. Current operation of the potable drinking water distribution system utilizes sodium hypochlorite to treat drinking water. Hazardous waste byproducts of the potable water system are minimal and contained and disposed of according to established guidelines.

3.14.2 Environmental Consequences

Proposed Action

There are no anticipated environmental consequences from the Proposed Action with respect to Waste Management. Although a well will be brought back online with the Proposed Action, effective containment and handling of any wastes generated is contained and disposed of according to established guidelines.

No Action

There are no anticipated environmental consequences from the No Action alternative with respect to Waste Management.

3.15 Transportation

3.15.1 Existing Transportation

Pyramid Highway runs north-south through the Project Area and numerous residential streets are located within the Project Area. Roadways within the Project Area consist primarily of paved roads that provide access to residences and businesses.

3.15.2 Environmental Consequences

Proposed Action

There will be minor additional traffic associated with the maintenance and delivery vehicles to the well sites, however this will be during off-peak hours.

No Action

There are no anticipated environmental consequences from the No Action alternative with respect to Transportation.

3.16 Energy

3.16.1 Existing Energy Resource

Existing water resources are supplied under pressure through a wholesale water line from the TMWA or from municipal wells. The volume of water received from the TMWA water line will not be increased through the Proposed Action, but the location and timing of its use will be modified. Municipal wells in the Valley are operated on electricity supplied by NV Energy. Recently, operational strategies have been employed to reduce energy costs and need of future energy transmission and production facilities by operating the wells at night during off-peak demand periods. Information on reduced water schedules has also been provided to homeowners to help reduce the amount of water and thus energy used within the system.

3.16.2 Environmental Consequences

Proposed Action

There will be relatively minor increases in energy usage within the water system under the Proposed Action as DS#3 is brought back online. However, the well will only be operated for 6 hours a day and only during off-peak hours. There is insufficient space in the DS#3 well parcel or well house roof to accommodate photovoltaic energy sources to significantly offset the resumed energy usages at DS#3. There may be potential for a residential wind turbine at the site, however, and will be evaluated for its economic feasibility.

No Action

There are no anticipated environmental consequences from the No Action alternative with respect to Energy, as well DS#3 will remain offline.

Section 4: ENVIRONMENTAL CONSEQUENCES

4.1 Cumulative Impacts

Cumulative impacts on environmental resources in the area are beneficial in nature. Continued injection of potable water into DS#4 will dilute nitrate in the groundwater within the Project Area over time. If the Proposed Action is as beneficial as estimated, this process may be implemented in other areas within the Valley and throughout Washoe County that are experiencing similar problems. Allowing DS#3 to extract nitrate, will result in approximately 10,000 pounds of nitrate being removed from the groundwater over the project period. The water extracted at DS#3 will be blended with a new potable water blending line, ensuring that it meets all SDWA requirements.

In addition to the improvements to the potable water distribution system through injection and extraction activities, replacement of septic systems with municipal sewer is progressing as funding becomes available. The Proposed Action allows for the aquifer to be remediated and the water utilized while a major source of contamination (septic) are removed from service.

4.2 Selection of the Preferred Alternative

Three primary screening criteria were used when evaluating the alternatives, including operational effectiveness (must meet the project purpose and need), feasibility and cost-effectiveness, and environmental constraints (minimal impacts to environmental and cultural resources). After evaluating each alternative against the three criteria, Alternative 1 was selected as the Preferred Alternative. Potential impacts to resources were evaluated and described in Sections 4-1 through 4-12. Table 4-1 provides a summary of the potential impacts for resource areas fully evaluated and associated with the Preferred Alternative, Alternative 2, and the No Action Alternative.

Table 1: Summary of Impacts for Fully Evaluated Resources

Resource	Preferred Alternative (Proposed Action)	No Action Alternative
Air Quality	Spanish Springs is not located in a non-attainment area. There are no anticipated impacts to air quality from the Proposed Action.	Spanish Springs is not located in a non-attainment area. There are no anticipated impacts to air quality from the No Action Alternative.
Noise	Noise levels will be increased temporarily for 3-4 days during drilling and installation of monitoring wells and return to pre-installation levels.	There are no anticipated impacts to noise levels quality from the No Action Alternative.
Surface Water Resources	There are no anticipated impacts to surface water from the Proposed Action.	There are no anticipated impacts to surface water from the No Action Alternative.
Groundwater Resources	There is the potential for a short-term increase in nitrate concentrations in groundwater through injection of potable water at DS#4. As the mound of injected water rises, septic effluent en route to groundwater may be entrained and impact groundwater. These impacts are anticipated to be reduced and in fact, a positive impact of reduced in-situ concentrations of nitrate and removal of approximately 10,000 pounds of nitrate obtained through the project period.	Continued groundwater quality degradation through nitrate accumulation is expected with the No Action Alternative.
Wetlands	There are no wetlands within the Project Area.	There are no wetlands within the Project Area.
Floodplains	There are no 100-year floodplains within the Project Area.	There are no 100-year floodplains within the Project Area.
Public Health and Safety	It is anticipated that long-term improvements to water quality at DS#3 and within the groundwater will be attained through the Proposed Project.	If the groundwater is allowed to degrade and nitrate to accumulate in groundwater, there is the potential for high nitrate concentrations to spread to other municipal wells in the area.
Surface Resources: **Topography, Soils, and Geology**	No significant landforms or unique landforms to be impacted by construction as all construction will be performed in existing streets and well houses. No significant impacts to soils and geology.	There are no anticipated impacts to surface resources from the No Action Alternative.
Vegetation and Terrestrial Wildlife	No areas of unique, sensitive, or threatened vegetation, wildlife or their habitat to be impacted by the Proposed Action.	There are no anticipated impacts to vegetation and terrestrial wildlife from the No Action Alternative.
Cultural Resources and Historic Property	According to NV SHPO there are no cultural resources in the Project Area. No impacts are anticipated.	According to NV SHPO there are no cultural resources in the Project Area. No impacts are anticipated.

Resource	Preferred Alternative (Proposed Action)	No Action Alternative
Land Use	There are no anticipated environmental consequences from the Proposed Action with respect to Land Use as all work will be conducted within existing well facilities.	There are no anticipated impacts to land use from the No Action Alternative.
Aesthetics	There are no anticipated environmental consequences from the Proposed Action with respect to Aesthetics as all work will be conducted within existing well facilities.	There are no anticipated impacts to aesthetics from the No Action Alternative.
Socioeconomics & Environmental Justice	There are no anticipated environmental consequences from the Proposed Action with respect to Socioeconomics and Environmental Justice.	There are no anticipated impacts to socioeconomic or environmental justice considerations from the No Action Alternative.
Waste Management	There are no anticipated environmental consequences from the Proposed Action with respect to Waste Management.	There are no anticipated impacts from the No Action alternative with respect to Waste Management.
Transportation	There will be minor additional traffic associated with the maintenance and delivery vehicles to the well sites, however this will be during off-peak hours.	There are no anticipated impacts from the No Action alternative with respect to Transportation.
Energy	There will be relatively minor increases in energy usage within the water system under the Proposed Action as DS#3 is brought back online. However, the well will only be operated for 6 hours a day and only during low-peak hours.	There are no anticipated impacts from the No Action alternative with respect to Energy.

4.3 Unavoidable Adverse Impacts

Implementation of the Proposed Action may result in a temporary, minor increase in nitrate concentration within the aquifer as the injection program begins. This nitrate would eventually reach the groundwater; this project would only accelerate the process where groundwater is mounded. Continued injection of potable water at 75 million gallons per year will attenuate this potential increase and ultimately lead to reduced concentrations of nitrate in the aquifer within the Project Area. Rigorous water level and water quality monitoring will be employed to minimize this potential impact.

Unavoidable adverse impacts associated with the No Action Alternative include increased long-term degradation of the groundwater and reduction of potable water from groundwater resources in the Project Area.

4.4 Relationship of Short-Term and Long-Term Productivity

Implementation of the Proposed Action would not result in adverse impacts to short-term or long-term productivity. Long-term effects of the Proposed Action would include the efficient use of wholesale water to help remediate and offset nitrate contamination in the groundwater in Spanish Springs, resulting in improved public health and quality of life, and socioeconomic benefits.

The No Action Alternative would result in adverse impacts on both short- and long-term productivity, i.e. the continued contamination of groundwater without being addressed, resulting in potential spreading of contamination and continued reduction of potable water supplies in the Valley.

4.5 Irreversible and Irretrievable Commitments of Resources

Water used for injection will ultimately be retrieved by pumping wells within the Project Area, therefore, no irreversible or irretrievable commitments of resources pertaining to this Proposed Action would occur.

4.6 Conclusion

This EID has been prepared in accordance with NEPA requirements. The EID reviews potential impacts of proposed improvements to the potable water distribution system of Spanish Springs Valley, Nevada, on environmental resources and concludes that there are no significant adverse impacts on the environment resulting from the implementation of the Proposed Alternative.

Section 5: REFERENCES

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