Mojave National Preserve

National Park Service
U.S. Department of the Interior

Environmental Assessment for Proposed Housing at Kelso, Mojave National Preserve, San Bernardino County, California

Mojave National Preserve
San Bernardino County, California

March 9, 2015

Introduction

1.1. Need for Action

The National Park Service manages and protects Mojave National Preserve in southeast California. Housing availability is extremely limited in this sparsely populated section of San Bernardino County. There is no available housing for rent or for sale either on private lands (e.g., Cima) in the Preserve or in the adjacent gateway communities of Baker, Nipton, or Essex. The nearest available housing is located more than a one-hour commute from any duty station within the Preserve. As the NPS increases its field operations, it must also have housing opportunities available for its staff. In keeping with NPS policy, Mojave National Preserve has replaced most of the trailers (i.e., mobile homes) with permanent residential housing. The NPS has extended its use of one double-wide trailer, moving it to the Kelso Housing Area, until more housing becomes available for park staff.

In 2014, a Housing Needs Assessment Report identified the need for six housing units for year-round required occupants, 14 housing units for year-round permitted occupants, and 22 bedrooms for seasonal permitted occupants.

Due to the remoteness of this park, housing for sale or rent in Mojave's gateway communities is scarce. The report identified an insufficient supply of houses for sale or rent within a 60-minute commute, making this an unviable source for employee housing.

Mojave's current housing inventory totals 12 housing units including five houses, two multiplex units, one dormitory, and four trailers (Table 2-2). Combined, they provide 14 bedrooms for permanent, year-round employees and 28 bedrooms for seasonal or unpaid employees. Mojave also has five recreational vehicle pads not included in the housing inventory; they are available for use by volunteers and the on-site manager for Western National Parks Association.

Table 1: Mojave Housing Inventory

Reporting station	Type of unit	Number of units			Total bedrooms (seasonal)	Total units (permanent)
		1BR	2 BR	3 BR+		
Baker	House	—	—	2	3	1
	Duplex	—	2	—	4	—
Baker total		—	2	2	7	1
Cima-Kessler	House	—	1	—	—	1
	Mobile	—	2	—	2	1
Cima-Kessler total		—	3	—	2	2
Headquarters	No Housing Units					
Hole-in-the-Wall	Dormitory	—	—	1	16	—
	House	1	—	—	—	1
Hole-in-the-Wall total		1	—	1	16	1
Kelso	Mobile	—	—	2	3	1
Kelso total		—	—	2	3	1

Reporting station	Type of unit	Number of units			Total bedrooms (seasonal)	Total units (permanent)
		1BR	2 BR	3 BR+		
OX	House	—	—	1	—	1
OX total		—	—	1	—	1
Park-wide total		1	5	6	28	6

Table 2: Required and Permitted Occupants

Reporting station	Required occupants		Permitted occupants		
	Year-round positions	Seasonal positions	Year-round positions	Seasonal positions	Unpaid positions
Baker	1	—	3	6	1
Cima-Kessler	1	—	4	1	2
Hole-in-the-Wall	2	1	5	11	9
Kelso	1	1	2	3	4
OX	1	—	—	1	—
Total	6	—	14	22	16

NOTE: The park has many unpaid positions for which it would want to provide excess bedrooms, as available.

The 2014 Housing Needs Assessment Report determined Mojave's housing needs exceeded current housing capacity and local area housing availability. Without any action to increase the number of bedrooms and housing units, Mojave will not be able to effectively recruit or retain staff for its field operations.

An example of the Mojave housing supply and demand problem is the need for an additional six to seven positions for a new roads crew in the facilities maintenance program. The road crew will be dedicated to the care of the Preserve's 160 miles of paved roads and 70 miles of maintained dirt roads, which was transferred to the NPS in September 2013. This doubles both the Maintenance staff and the park's needs for housing associated with these positions. Existing NPS and available community housing will fulfill these imminent operational demands.

There is a need for centrally located employee housing in Mojave for multiple reasons:

The Kelso Depot Visitor Center, Kelso Ranger Station, and a planned maintenance facility that will provide working space for a projected total of 14 to 16 employees after the maintenance facility is built. The closest employee housing is at Baker, a 36-mile drive from Kelso. The residences at Baker are already occupied, and would be insufficient to meet the park's expanding operational needs.

The proposed housing near the historic Kelso Depot and Kelso Schoolhouse, as well as other park facilities within the Kelso district, will provide a deterrent to vandalism and theft from a more constant NPS presence.

Employees residing at Kelso would be able to provide quick emergency responses. One law enforcement ranger position at Kelso has required occupancy for precisely this reason. Other operations will also benefit in emergency situations arising from weather events, utility service breaches, and visitors in distress.

1.2. Purpose of this Proposed Action

Mojave needs to address the critical shortage of employee housing that meets current National Park Service housing standards. New housing is needed that will hold employees who will be doing facilitate mission-critical operations in Mojave National Preserve. To compensate for the lack of available rental or purchase residential properties in the area, the NPS must look to other options such as the construction of new housing to meet operational needs. In fiscal year 2015, the NPS is completing construction of one fourplex to replace trailers occupied by park staff. One of those trailers has been extended for use at the Kelso Housing Area, but will be removed once additional housing can be secured for park staff. This housing proposal for Kelso will complement the recent construction at Kessler Spring Ranch and allow the Preserve to advance towards achieving sufficient field operations to meet its management needs.

The Housing Needs Assessment identified the need for an eight-bedroom dormitory and a six-bedroom apartment complex the highest priority action required to support park operations. It is proposed that this new employee housing be built at Kelso where the largest number of positions will be duty stationed.

This proposed action will also allow Mojave National Preserve to comply with current NPS housing policy by removing double-wide housing trailers constructed in the 1970s that are currently being used as employee residences.

Figure1: Project Location Map

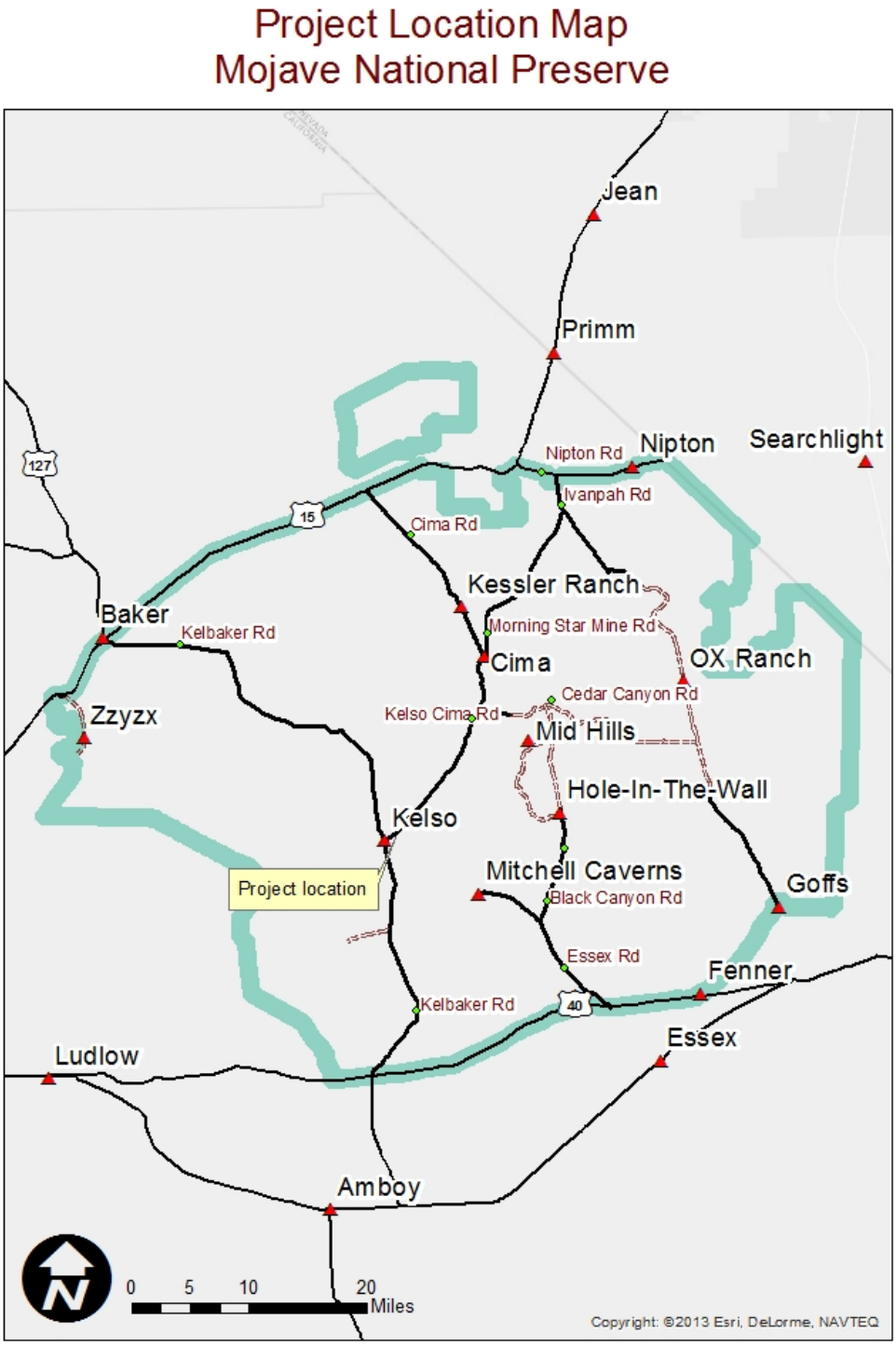


Figure 2: Kelso District

1.3. Reference to the General Management Plan

The General Management Plan (GMP) states on page 65, "Additional housing for employees in the Kelso area will also be pursued to support park programs." The Proposed Action fulfills this management goal. By providing housing at Kelso, the NPS can expand its operations for Mojave National Preserve to meet management goals set out in the Preserve's GMP. The NPS anticipates the housing at Kelso will accommodate park staff in Maintenance, Interpretation, Visitor & Resource Protection, and Science and Resource Stewardship divisions.

2. Affected Environment

The lands making up the Kelso Housing Area (KHA) were acquired by the National Park Service for administrative uses. In Figure 2, the project site is outlined in red. The KHA is located on the northwestern side of Kelso-Cima Road, 0.5 mile northeast of Kelso Depot and the intersection with Kelbaker Road. It is situated within desert tortoise critical habitat.

The eastern portion of the site was homesteaded in 1931; in Figure 2, this area is filled with blue diagonal lines. It was part of a larger tract of land acquired in 2004; the tract includes grounds surrounding the KHA. These grounds were granted for a railroad right-of-way in 1906. In 1932 and 1933, two easements were granted to the Los Angeles and Salt Lake Railroad Company for storm water drainage ditches. Aerial photographs and a site inspection completed in 1995 indicate flood dikes, rather than ditches; the dikes are intact to the northwest and east of the KHA.

The western portion, also acquired in 2004, currently has four pads for recreational vehicles (RVs) and available for volunteer and temporary use. In 1988, Mrs. Lowella Parker purchased the parcel with a mobile home onsite from a former Union Pacific Railroad employee. The parcel had been previously used as a residence for railroad employees, with water supplied by UPRR. According to anecdotal information from local residents, railroad employees had lived on this site since before World War II.

3. Alternatives

3.1. No Action

The No Action alternative describes the continuation of MOJA's current housing situation. The existing double-wide trailer at Kelso has been replaced with the new housing at Kessler Spring Ranch, and will be removed,in compliance with NPS nationwide housing standards. Without immediate replacement, the Preserve would be left with a housing deficit of four bedrooms for an indefinite period of time. The NPS's ability to adequately staff MOJA's field operations would be compromised.

Under No Action, Preserve housing needs will be exacerbated over time. Employees in required occupancy positions for fire, law enforcement, medical and utility emergency programs will be forced to live outside the park and beyond maximum timed response limits to carry out their

jobs. Employees in optional occupancy positions have difficulty finding housing in the Preserve's gateway communities within a one-hour commute. The Preserve will not be able to fill mission-critical positions, compromising its ability to operate and having a detrimental effect on the visitor experience. Taking no action excludes construction of new housing, but does include the removal of existing substandard housing to meet national NPS housing standards.

3.2. Proposed Action: Construction of Employee Housing at Kelso Housing Area

General Description of the Kelso Housing Area and Proposed Action

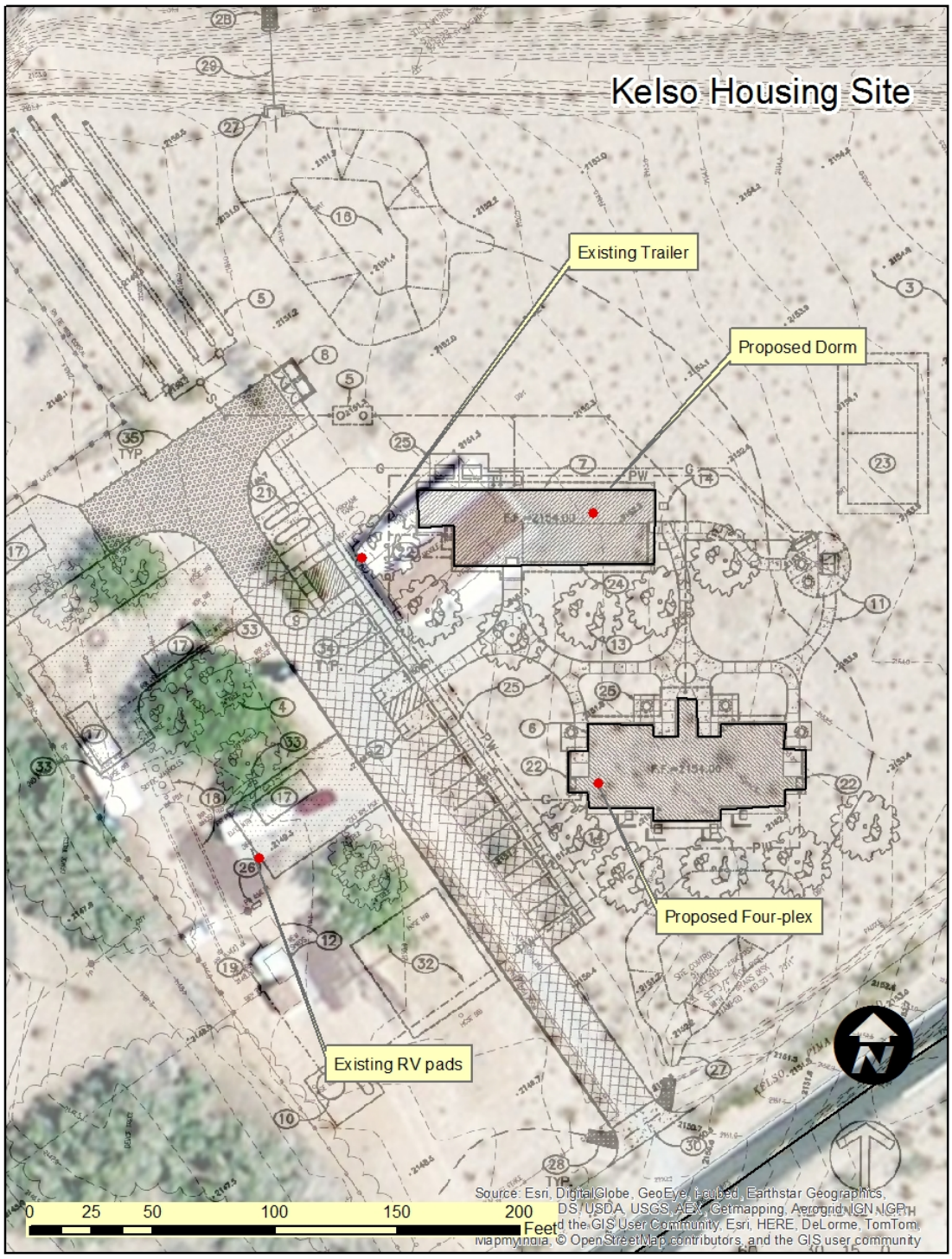
The existing Kelso Housing Area (KHA) is located northeast of Kelso Depot on Kelso-Cima Road, at the center of Mojave National Preserve. See Figure 1. The KHA is within a ten-minute drive or less to the Kelso Depot Visitor Center, Kelso Schoolhouse and the proposed Kelso Maintenance Facility, which are either within walking distance or a five-minute drive for its residents. From Interstate 15 at Kelbaker Road, KMA is 30 miles south, then 0.5 mi northeast on Kelso-Cima Road (Figure 1); it is a similar distance north from Interstate 40. The land was heavily developed prior to acquisition by the NPS. The NPS uses the site for administrative purposes, and housing having constructed four pads for recreational vehicles, and re-locating one double wide trailer for multi-occupancy housing.

The proposed development site sets at an elevation of 2,161 feet and is surrounded by a creosote plant community. This parcel was purchase and donated to the NPS in 2004, prior to that, a private owner had used it for various purposes, including the parking of a house trailer that was occupied for several years. The corral and animal pens apparently were used at some time to raise animals. The previous owner had a trailer on the land that was occupied. There are no perennial surface water sources within 4 miles of this area. The double-wide trailer and RV pads rely on a 1200 -/+ deep foot water well which also supplies water to Kelso Depot. KHA lies outside of the Kelso Historic District and is visually screened by an existing row of trees that visually screens this area from the Historic Kelso District. There are the remains of some old corral features on the northwest corner of this parcel with wooden posts and wire fence line and a small shed. These features will remain and be protected, leaving them intact an unaffected in the proposed housing development.

There are four large trees that separate the existing RV pads and provide shade for staff and volunteers who use these pads. These trees will remain with the gravel RV pads. A dirt access road provides a link between the RV pads, double wide trailer and Kelso-Cima Road. See the following image of the existing conditions for more information on what currently exists on this parcel.

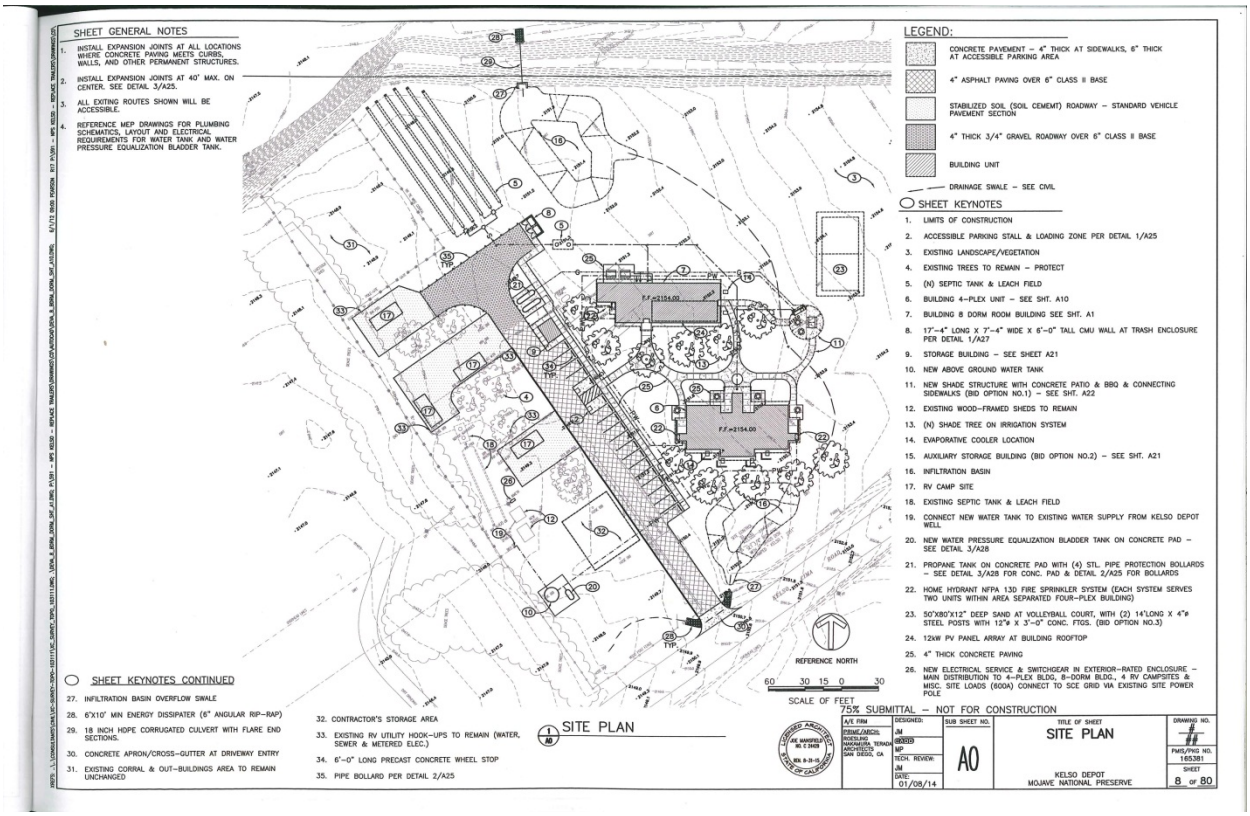
Figure 3: Kelso Housing Area

Figure 4: Proposed Development Plan Overlaid onto an Image of Existing Conditions



Project Locatoin Map - Mojave National Preserve
California 2014

Figure 5: Proposed Site Development Plan at the Existing Kelso Housing Area



Trailer Removal & Utilities Installation/Adaptation

The National Park Service proposes to construct two permanent structures – one eight-room dormitory dwelling and one four-unit apartment building – at the Kelso Housing Area once a double-wide trailer on site has been removed. The two proposed buildings will increase the Preserve's housing capacity greater than four-fold.

The existing trailer will be removed from the site, then sold as surplus government property or as determined by the excess housing evaluation process. The trailer's colors and metal exterior siding do not blend in with the surrounding desert environment; its removal will also take away this visual conflict.

Existing utilities include telephone, electrical power, septic tank and potable water. The telephone, electrical and water utilities will all be adapted and connected to the proposed facilities. Some underground utilities will be abandoned in place if it is determined that removal would disturb the existing tree root systems, or will be removed if they interfere with the new construction. All exterior features of the double wide trailer such as the attached covered awning will be removed. The existing septic tank and leach field that serves the RV pads will be protected and remain for continued use.

The proposed housing is designed to accommodate both permanent and seasonal employees. Figure 3 provides a generalized layout of the proposed new housing and utility areas that will occupy approximately three acres; the design phase will finalize the exact placement of buildings and utility systems once the environmental analysis has been completed. The entire footprint of the KHA is 2.5 acres.

Buildings

New residences and associated utilities will be constructed entirely within the footprint of existing disturbance at Kelso. This Proposed Action places new construction within the footprint of the existing trailer and carport. New construction includes one 3,015 square-foot dormitory dwelling with eight one-bedroom units, and one 3,247 square-foot apartment with two one-bedroom and two two-bedroom units. The buildings will conform to NPS-approved Housing Program floor plans and staff housing design specifications. They will also conform to site-specific building standards that best reflect the local architectural style, California earthquake standards, and climate of the Kelso area. Design will include pitched roofs and a subdued stucco exterior, painted to blend with the surrounding landscape. The new structures will have a net visual benefit compared with the existing doublewide trailer. They will have a larger mass than the trailer but will be assimilated into their surroundings with a non-reflective stucco exterior painted to match the sand-colored soils and desert habitat. The KHA site includes a historic fence and shed on the northwest corner; measures will be taken to avoid impacts to these features.

The proposed driveway from Kelso-Cima Road would be paved with asphaltic concrete and provide parking spaces for 18 vehicles, which includes two accessible parking spaces set on concrete pavement. A concrete pathway system will link the parking lot to the building entrances. Two storm water retention basins will be created to store water coming from the parking lot and driveway. This design feature will allow for ground water recharging.

Sustainable Design

Each housing unit will be fitted with water conserving toilets and showerheads. Instant hot-water heaters will reduce energy requirements for the occupants. Photovoltaic solar panels set on the roof of one structure will feed electrical current back into the electric grid system. To offset the occupants' electrical use. Design of the roof eaves will create shade for windows with southern exposure during the hottest periods of the day, while allowing light to enter the units during cool winter months. Energy efficient, double-pane windows will be installed with wood frame construction to conserve interior heating and cooling. The proposed storm water surface design incorporates a retention pond to capture water runoff from pavement and soil surfaces. The pond will allow for seepage into the groundwater table that would otherwise be lost to evaporation. Solar light tubes will be installed on the roofs to channel natural light into living spaces, reducing the need for electric-powered lights.

Landscaping

During construction, a temporary construction limit fence will be placed to protect the existing vegetation to remain. A concrete sidewalk system will connect both buildings to a future shade structure that could have a picnic table and barbeque grill for employee use. Space will be allocated for a future sand volleyball court for recreation use by the residents.

The existing housing area does not have Joshua trees. The existing trailer and carport have denuded much of the site; for this reason, minimal vegetation will require salvage and transplantation. All salvaged plants will be relocated within the KHA.

Protection of Dark Night Skies

Exterior electrical lighting will be installed with shields to direct light downward towards the ground, away from the dark night sky. Several exterior lights will also have light and motion sensors that turn on only as necessary and for limited periods of time.

Accessibility

The KHA is located on Kelso-Cima Road north of Kelso Depot and the Kelso Schoolhouse. A driveway from Kelso-Cima Road provides access to the housing site, which is visible from the road. Paved driveway, parking and concrete sidewalks will be constructed for the residences in meet accessibility requirements under the Americans with Disabilities Act (ADA).

Utility Systems

Existing utilities include telephone, electrical power, septic tank and potable water. Telephone, electrical and water utilities will be adapted and connected to the proposed facilities.

Electrical

Southern California Edison provides electrical distribution to the Kelso Housing Area. Newly constructed facilities will tie into the existing electrical grid network. A set of photovoltaic electrical panels will be placed on the roof of the dormitory to feed electricity back into the grid. Building design will include energy conservation measures such double pane energy efficient windows, extra wall and ceiling insulation to help keep heat gain down in the summer and heat in the living spaces during the winter. Evaporative coolers will be included in the building designs for summer cooling. They will also reduce electrical energy use for residents.

Parking

The site plan for the Kelso Housing Area will include designated parking areas for the residents. Funding for the Proposed Action is limited and does not allow for vehicle shade structures.

Potable Water

1200 foot deep water well located east of the Kelso Depot provides potable water to both the Kelso Depot and the KHA for drinking and structural fire sprinkler use. A set of temporary water storage tanks and an existing underground distribution system provides water to both the KHA

and the Kelso Depot Visitor Center. This water system will continue to provide water to the proposed housing. No modifications to the distribution line that connects the well to this development site are planned with the exception of the replacement of the underground tank with an above ground 11,000 gallon tank that will occur in a separate contract.

After the existing water main line crosses into the southwest corner of this development area, it is proposed that a 10,000 gallon above ground water tank be placed close to the existing trees near the south east corner of the property. A proposed pressure pump will be installed to provide the required water pressure while the proposed tank will assist in meeting the 2010 California Fire Code for structural fire protection for the fire sprinkler systems that will be installed in the buildings.

Figure 6 below shows details of underground pipe locations. PW = Potable Water line, S = Sewer Line and G = Propane Gas Line. There is an estimated 475 feet of trench dug for new water line. Trenches will be 3.5 feet deep by 1.0 to 1.5 feet wide.

Figure 6: Proposed water and sewer line locations

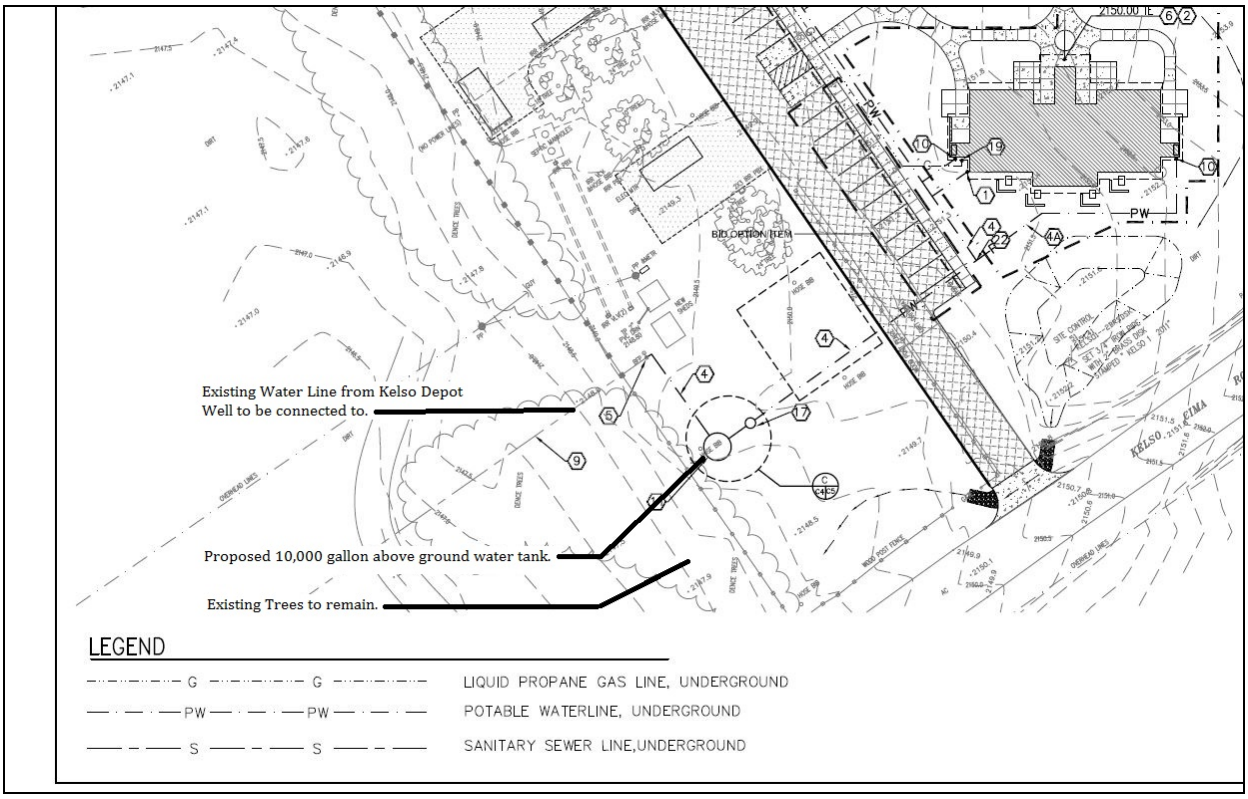
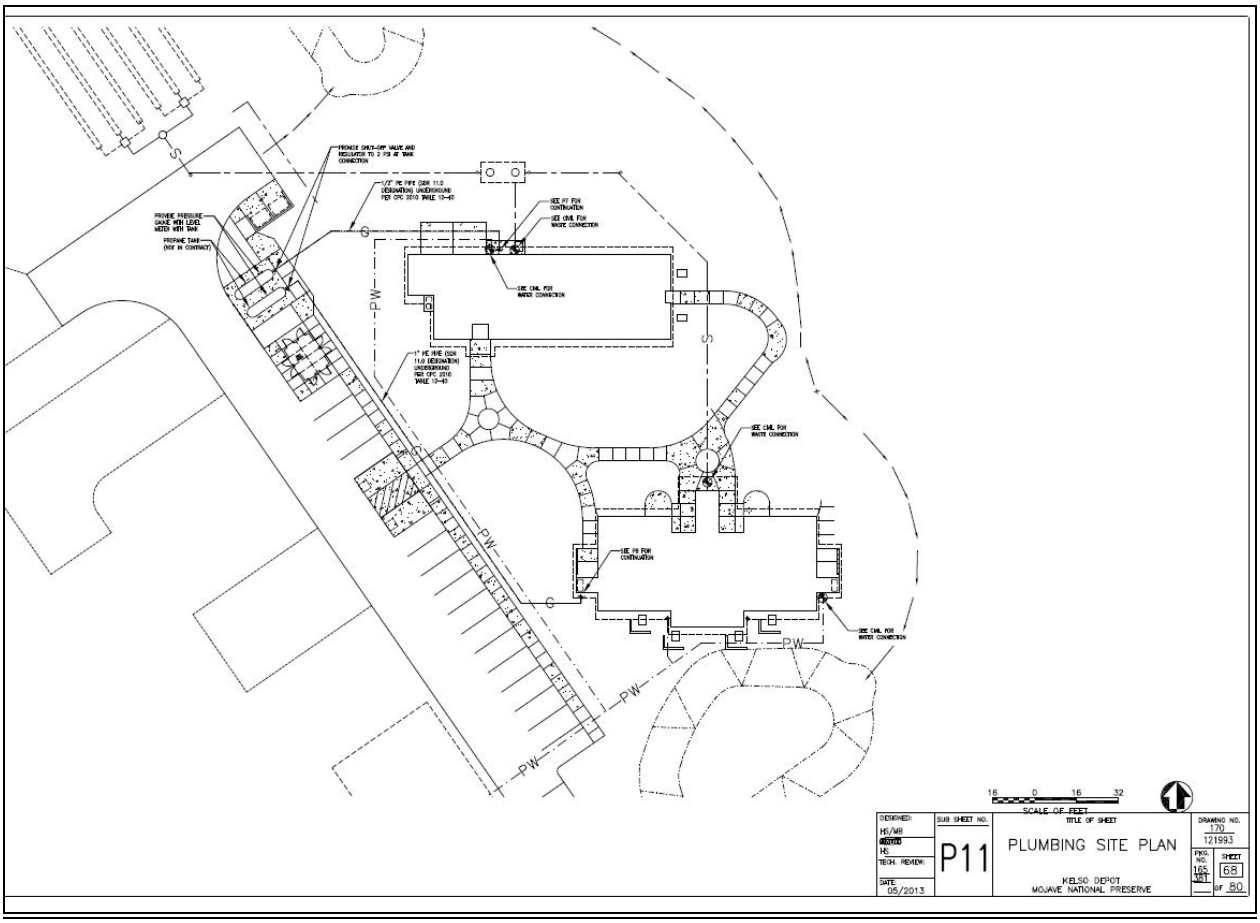


Figure 6A: Proposed Water and Sewer Lines

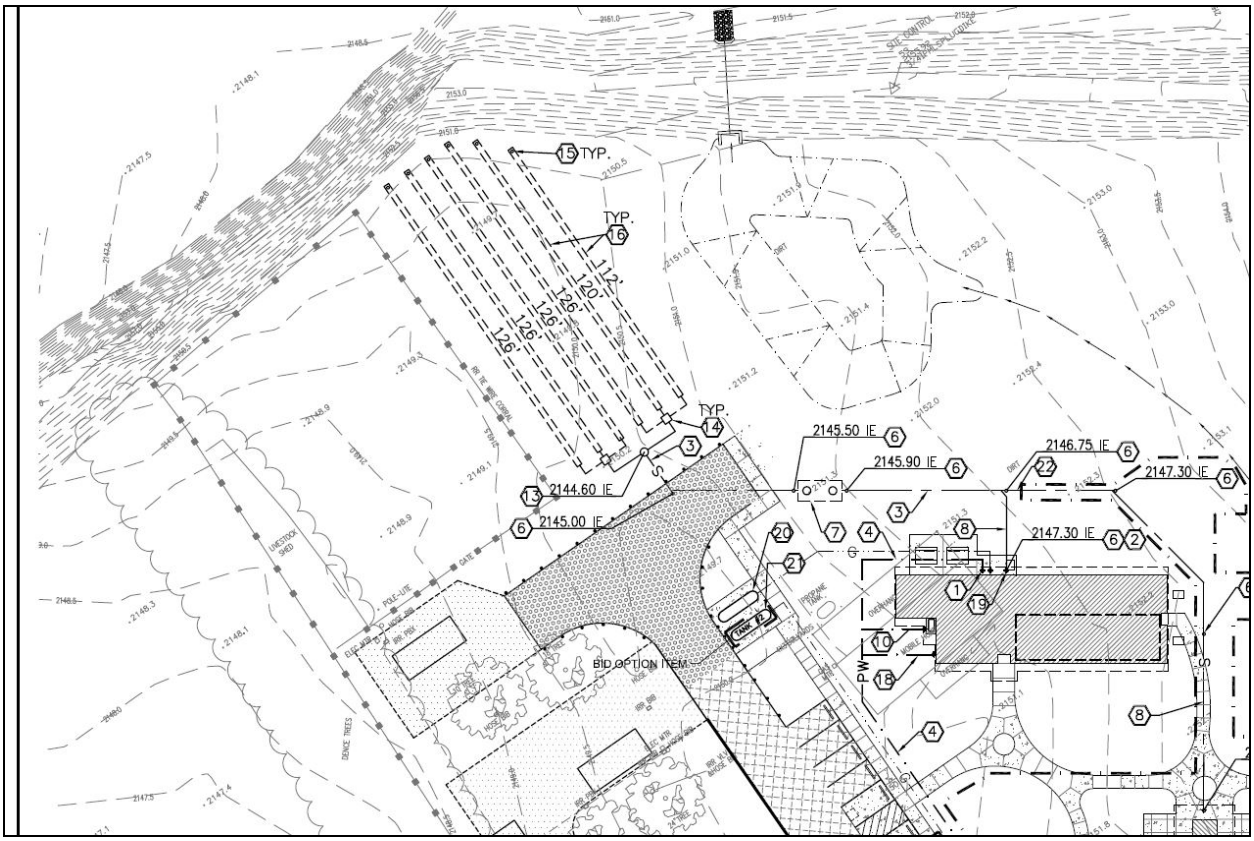


Septic System

The NPS will install new wastewater system including one septic tank and drain field and provide all the capacity needed to support all of the proposed housing for the Kelso housing site. See the site plan below. The underground septic tank and leach field is noted in Figure 7 as item #7 "septic tank" and #16 "leach field lines" on the plan, located on the north side of the parcel, approximately 15 feet east of the old fence line.

The system will include an estimated 320 feet of sewer pipe, one 3,000 gallon tank and 736 feet of leach field drain line. The leach field will be installed on previously disturbed land. The septic system is expected to last at least 20 years. See Figures 4 and 5 for details on the locations of proposed lines.

Figure 7. Proposed Septic Leach Field Location



Trash

A trash dumpster will be located at the upper right of the "T end of the driveway, away from the buildings. A concrete walk will connect the dumpster to the buildings.

Telephone

An existing phone line runs along Kelso-Cima Road and will be extended below ground along the edge of the driveway to the new housing to provide telephone service for residents.

Internet/Television/Communication Connectivity

Individual housing units will be provided with small rooftop, commercial mounted satellite receivers, as needed, to provide internet, television, and communication services.

3.3. Alternatives Considered But Rejected

3.3.1. Provide Housing at the Community of Cima

This site was considered but rejected due to the lack of land, access, or water. Most of the land in Cima is privately owned and not available for sale. The NPS owns a parcel of approximately four acres that is not easily accessible. It is located one mile beyond Cima Road via a dirt utility road. Cima Dome has a very shallow groundwater table with minimal water. Local residents rely on water either piped or trucked in from off site. The NPS has a well at Kessler Spring Ranch. It previously served two double-wide trailers at Kessler Spring and Cima, with an underground pipe laid for 3.5 miles to the latter site. An engineering study of the Kessler well prepared in 2004 determined the well production at 10 gallons per minute, adequate for the newly constructed four-plex apartment building. The four-plex will require the maximum production from the Kessler well for both residential use and structure fire suppression.

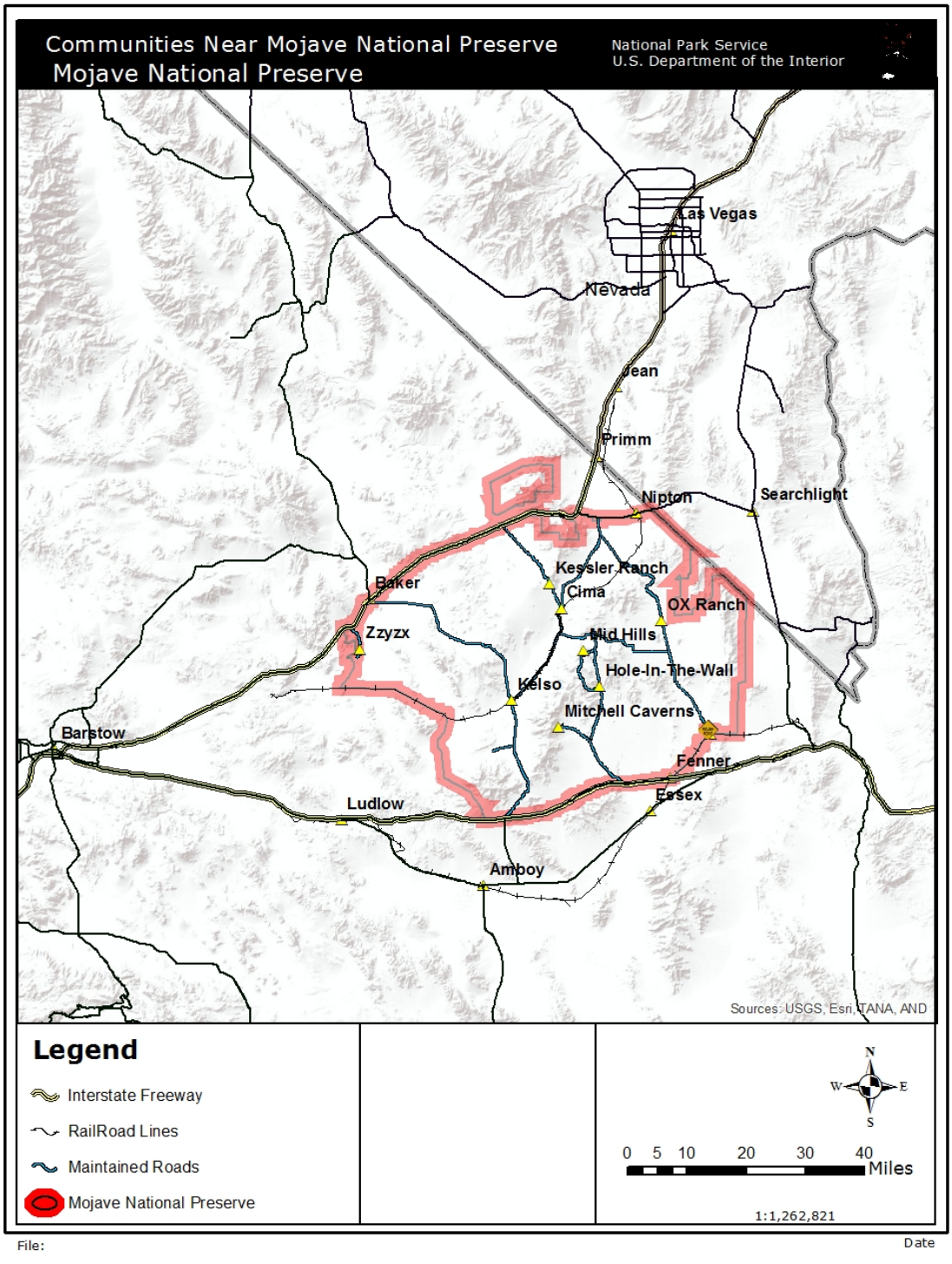
3.3.2. Provide Housing at Other Locations in Northeastern Portion of Mojave National Preserve

Water is a constraining factor throughout the Mojave Desert. The NPS explored various locations throughout the northeastern portion of the Preserve for potential housing but were unable to locate sufficient water supply to meet the residential housing needs for the project.

1.3.3 Provide Housing at the OX Ranch

The OX Ranch currently has one two-bedroom, single family house occupied by park staff. The house is part of the historic ranch, and its occupation provides security associated with a constant NPS presence onsite. Current residents have two route options for commuting to their duty station at Hole-in-the-Wall. The OX Ranch was eliminated from further consideration as an employee residential area because of its location in a floodplain. Cedar Canyon Road, which links the OX Ranch to the Preserve's other administrative facilities and visitor contract centers, is often impassable during the summer months after monsoon flash flood events occur. The OX Ranch lies east from the Preserve's center point, and does not have alternate commute routes within 60 minutes for employees whose station is Kelso (see Table 2).

Figure 8: Locations of Communities near Mojave National Preserve



3.3.4 Hole-in-the-Wall was considered but rejected because road access can be quickly cut off from the main visitor contact facility and staff offices at Kelso Baker and this location when flash flood events occur and Black Canyon and Cedar Canyon Roads are closed till repair work can take place. These roads can be shut down for one day to one week, depending up the road damage. Hole in the Wall is off the power grid and would require extensive photovoltaic support for electrical power for new housing.

3.3.5 Rental Housing in Adjacent or Nearby Communities

The Park has tried unsuccessfully to obtain through agreements rental housing in Baker, Cima, and Essex. The recent housing survey failed to find adequate rentals for employees within a one-hour commute from Kelso. The NPS rents one double-wide mobile home at Kelso from Union Pacific Railroad; other housing at Kelso is reserved for railroad employees. Other opportunities are extremely limited.

There are two additional communities outside of Mojave's boundaries that were considered: Mountain Pass and Nipton. There were no private properties available for sale or rent in either community that could provide adequate, non-NPS owned housing for park employees.

3.4 Environmentally Preferred Alternative

As defined in NPS Director's Order 12 and Reference Manual 12, the Environmentally Preferred Alternative is that which causes the least damage to the biological and physical environment. The Environmentally Preferred Alternative best protects, preserves, and enhances historic, cultural, and natural resources.

The KHA has been a site of modern human occupation since the 1930s. Under either the No Action or Proposed Action alternatives, the site will continue to be used for administrative purposes. Historic, cultural, and natural resources in the KHA and within the surrounding Kelso district will be neither enhanced nor significantly impacted by construction of permanent structures at the KHA. The water, electrical, and telephone utilities are already in place, and are not associated with increased ground disturbance for underground installations. Under the Proposed Action, the KHA will be able to house more park staff, increasing the NPS presence in the Kelso District. This will indirectly increase security to other park facilities within the Kelso Historic District, such as the Kelso Schoolhouse and Kelso Depot. Park staff living at the KHA would be able to quickly respond to emergencies at the Kelso Depot and Kelso Schoolhouse, better securing these historic and administrative facilities to prevent vandalism and theft, and to respond to utility system failures. For these reasons, the Preferred Alternative is also the Environmentally Preferred Alternative.

4. Environmental Analysis (includes affected environment and impacts)

4.1. Impact Analysis Parameters

- Direct effect: An impact that occurs as a result of the Proposed Action or alternative in the same place and at the same time as the action (NPS 2001b).

- Indirect effect: Reasonably foreseeable impacts that occur removed in time or space from the Proposed Action. These are "downstream" impacts, future impacts, or the impacts of reasonably expected connected actions (NPS 2001b).

- Duration: This is an estimate of the period of time that a resource will be impacted. Duration is determined to be either short-term or long-term.
  - Short-term: Impact is not likely to be observed beyond five (5) growing seasons.
  - Long-term: Impact is likely to be observed beyond five (5) growing seasons.

- Magnitude: This is an estimate of the intensity of the impact that a resource will be subjected to. Magnitude is determined to be negligible, minor, moderate, or major.
  - Negligible: Impact is barely discernable.
  - Minor: Impact is barely measurable and is generally localized.
  - Moderate: Impact is measurable and may be localized or regional in scope.
  - Major: Impact is obviously measurable and is generally regional in scope.

- Direction: This is a value assigned based on the purposes for which Mojave was established. Direction can either be positive or negative.
  - Positive: Impact or change that promotes the long-term preservation of natural resources, ecological processes, and/or cultural resources.
  - Negative: Impact or change that is adverse to the long-term preservation of natural resources, ecological processes, and/or cultural resources.

4.2 Impact Topics

As per Director's Order/Reference Manual #12: Environmental Compliance, this impact analysis is focused on those resources that have the potential for direct or indirect impact from the alternatives described above. Direct impacts will, for the most part, be limited to the immediate vicinity of the Kelso housing facility and virtually all of the area has been previously disturbed by previous private and government housing facilitating operations at the site over the many years or occupancy.

Topics Selected for Further Analysis

Cultural Resources – Prehistoric, historic, cultural landscapes, and ethnographic resources: National Park Service Policy as well as the National Historic Preservation Act direct that parks consider the effects of their management decisions on cultural resources. The proposed construction has the potential to affect cultural resources, particularly undocumented below ground archaeological resources.
Park Operations: Provision of housing for required occupancy positions is fundamental to carrying out park operations, therefore impacts to park operations are furthered reviewed.

Vegetation: Construction of the new buildings and utility systems will directly impact vegetation on site. The project will also include landscaping. Long-term residential use has the potential to indirectly impact vegetation.

Wildlife: the Proposed Action will directly impact wildlife habitat and can cause displacement of small burrowing animals.

Threatened and Endangered Species: The project site, the Kelso Housing Area, lies within designated critical habitat for the federally and State listed desert tortoise (*Gopherus agassizii*). Both the federal Endangered Species Act and National Park Service Management Policies 2006 direct parks to consider the effects of their management decisions on threatened and endangered species. This topic is further analyzed with regard to desert tortoise.

Water Resources: Surface waters are rare in desert landscapes, yet are critical for maintaining wildlife and accommodating human use. Groundwater resources are critical to the maintenance of surface waters and provide much of the water used for human consumption. Wetlands and floodplains are also critical water-related resources and there are specific legal requirements for their protection (EO11990 and EO11988). New water and sewer systems have the potential to affect both quality and quantity of groundwater resources.

Topics Dismissed from Further Analysis

Air Resources: Both National Park Service policy (NPS 2001c) as well as the Clean Air Act direct the protection of clean air. Proposed utility systems are emission-less solar and propane power. Air quality impacts are limited to the generation of dust during the short period of construction activities; therefore, this topic is dismissed from further analysis.

Geology, Paleontology, Geomorphology, Soils: National Park Service Management Policies 2006 direct all resources in units of the National Park System to be protected. Therefore, effects on such resources must be considered when selecting and implementing management actions. The development proposed is of limited scope and is located within an area with a long history of modern day human occupation. No measurable direct or indirect effects are anticipated to geology, paleontology, geomorphology or soils.

Natural Quiet: Proposed utility systems are powered by a noiseless solar electric system with a quiet propane-powered generator for back-up. Demolition and construction noise will be discernable from ambient sound, but will be localized and of short duration. The limited, temporary nature of these impacts eliminates the need for further review.

Socio-economic: While the demolition and construction will provide short-term employment for some people and limited revenue for some businesses, those affects are so negligible that socio-economic impacts are not further analyzed.

Visitor Use: National Park Service policy directs that parks consider the effects of their management decisions on visitor use. As the Kelso Housing Area is currently not open to the public and the construction of new housing would not change that status, impacts to visitor use are not further analyzed.

Wilderness: National Park Service policy as well as The Wilderness Act directs that parks consider the effects of their management decisions on designated wilderness. There are almost 700,000 acres of designated wilderness in Mojave National Preserve, but Kelso is not in or adjacent to Wilderness. Therefore, impacts to wilderness are not further analyzed.

Cumulative Impacts

There are no planned or on-going activities that would impact the same resources in the same area. The No Action alternative excludes the opportunity to introduce invasive or non-native plant materials that would otherwise be associated with a construction project. For the Proposed Action, during the contracting phase bid specifications will be required to include a requirement that all equipment brought to the construction site be clean and free of debris, including plant materials. For either alternative, there are no identified cumulative effects.

4.3 Impact Analysis by Topic

4.3.1 Water Resources

There are no perennial surface flows, housing or other ground water resources reaching the surface at Kelso housing site. The very deep wells and lack of water-loving vegetation near the historic Kelso housing facility area attest to the deep water table that is over 900 feet down.

Under the No Action alternative, the existing trailer would be removed and no new residences would be built so the household and garden use of water would cease. So there would be substantially less pumping of groundwater at the Kelso well than what presently exists. This would result in negligible, indirect positive impacts to groundwater resources.

The Proposed Action would continue indirect impacts to the deep groundwater table that feeds the Kelso Well. The Proposed Action would continue the use of well water to support up to five households, and small gardens or yards. Modern, water-efficient appliances and plumbing for the five new households would likely make the household use about equivalent to the current use by three old trailers or the historic use by three households. The water use to support the two proposed buildings is expected to be slightly more than what is currently use at the housing trailer and RV pads. Overall, the Proposed Action would use about the same groundwater than was previously used by the existing Kelso housing operation because of water efficient devices that would be built into the housing. The water system that has been proposed for Kelso has a large capacity and tank system which will be more than adequate for the expected water demand associated with the new housing.

The septic system would have no impact to water resources as it would be an engineered system composed of septic tanks and gray water infiltration, with the gray water infiltration field separated from the wash by an 8 foot tall berm, and 1970 feet from the well.

In conclusion, the No Action would result in negligible, indirect positive impacts to groundwater resources due to the reduction in groundwater use. The Proposed Action would result in minor, negative, indirect impacts to water resources due to the continuation of groundwater use.

4.3.2 Vegetation

The project area is dominated by creosote bush (*Larrea tridentata*), burroweed (*Ambrosia dumosa*), with other plant such as box thorn (*Lycium andersonii*), prickly-pear (*Opuntia* spp.), and globemallow (*Sphaeralcea ambigua*).

Creosote bush scrub is one of the most widely distributed desert communities, and anyone who drives through any areas of either the Mojave or Colorado Deserts is bound to pass through seemingly endless miles of almost symmetrically-spaced creosote bushes. The majority of the desert floor and the lower slopes of foothills to about 3500' is covered by this scrub community, the soils being well-drained, and the climate consisting of very high summer temperatures and winter temperatures rarely approaching freezing, with annual average rainfall being about 0"-2" in a dry year to about 8" in a wet one. One of the things that distinguishes both this community and Joshua tree woodland is the fact that some of the annual rainfall arrives in the form of summer showers, so that there are many shrubs and annual species that bloom either in the summer or in the fall. And although creosote bush scrub is dominated by woody shrubs, both herbaceous annuals and perennials are well represented, and in a rainy season such as we had in 1997-1998, the normally barren ground is literally covered with bloom.

The area proposed for new housing construction has been disturbed since the 1930’s. At present, the site contains a triple-wide mobile home and carport. Herbaceous plants include a fairly continuous cover of non-native species. Any vegetation removal deemed

necessary will be concentrated on non-native and invasive plant species. Native succulents will be transplanted, as necessary, elsewhere within the KHA.

There are no known rare or protected plant species that occur in this area of Mojave and the long-term human occupation at the Kelso housing site make it highly unlikely for such species to have persisted at this location. Indeed, the persistence of non-native species in the vicinity of the buildings is indicative of a disturbed landscape with little potential to support rare or specialized species.

The No Action alternative will result in little to no impacts to vegetation. The area surrounding the existing four recreational vehicle pads and their utility systems is mostly bare ground or weedy or landscape species indicative of a disturbed site. The absence of employees in residence is not likely to have any impact on vegetation.

In the Proposed Action, 2.5 total acres will be cleared of existing vegetation. The total also includes approximately 1.4 acres of long-term disturbance by occupation where the footprints of buildings, driveways, and other surface infrastructure would continue to displace vegetation. After construction is completed, 1.1 acres will be landscaped for a residential area. Species likely to be impacted are mostly native creosote. No Joshua trees grow in the area. The western portion of the KHA, which has a windbreak of tamarisk and shade trees, will remained unchanged.

The areas to be landscaped after construction is completed would be re-colonized by non-native red brome (*Bromus rubens*), schismus (*Schismus barbatus*), and filaree (*Erodium* sp.). These are weedy annuals are found throughout the Mojave Desert, and are unlikely to cause additional ecological harm. Opportunistic native species would eventually colonize those construction sites. Landscaping plans for the common areas of the housing area would focus on the establishment of low maintenance native vegetation. Yard use by residents could introduce other non-native garden and flowering plants, although NPS policy prohibits the introduction of non-native species that are likely to become naturalized. As most garden and landscape varieties cannot survive the harsh desert climate without constant human attention, it is highly unlikely that any yard materials would become naturalized weeds. A possible indirect impact is the potential for government vehicles parked at the Kelso Housing area to transport weed seed to and from Kelso Housing to and from other areas of Mojave that are not currently infested. To mitigate this concern, vehicles will be restricted to parking pads and driveways and both areas will be kept weed free using manual and mechanical methods.

In conclusion, implementation of the No Action alternative would result in no impacts. Implementation of the Proposed Action would likely result in direct minor, long-term, negative impacts to vegetation as a result of disturbance that would allow the persistence of non-native annual weeds.

4.3.3 Wildlife

The Kelso Housing area supports rodent and rabbit populations as well as many passerine bird species. Rodents occupy every building on the site, as well as adjacent natural habitats. Rabbits, including both cottontails and jackrabbits, are found throughout the developed area and surrounding habitat. Raptors, including great horned owls and red tailed hawks, frequently roost in the trees and feed on the rodent and rabbit populations. Lizards are seen around the recreational vehicle pads. There are occasional coyote and bobcat sightings in the vicinity of the KHA.

The No Action alternative would likely result in short-term impacts to rodent populations due to the removal of infested trailers. Most of the displaced rodents would find new habitat in other surrounding buildings. The area surrounding the existing RV pads and their utility systems is mostly bare ground or weedy or landscape species indicative of a disturbed site which do not have much habitat value for native wildlife, except for lizards and occasionally passerine birds that use the landscape trees immediately adjacent to the trailers. Removal of these structures or trees would result in short-term impacts to individual animals, but would not significantly impact any native wildlife populations. Likewise, the absence of employees in residence is not likely to have any impact on wildlife.

The Proposed Action would result in approximately 2.5 total acres of disturbance. This total includes approximately 2000 linear feet and 0.6 acres of disturbance limited only to the construction period. For example, installations of below ground utilities where vegetation is disturbed but can grow back after construction is complete and provide some habitat for wildlife. The total also includes approximately 1.4 acres of long-term disturbance by occupation where the footprints of buildings, driveways, and other surface infrastructure would continue to displace vegetation and eliminate wildlife habitat. The proposed disturbed area was surveyed for desert tortoise in 2014 and no burrows or tortoise were found.

In conclusion, implementation of the No Action alternative would result in direct, minor, short-term, negative impacts to wildlife as a result of displacement of a few individual animals that occupy the area around the trailers to be removed. Implementation of the Proposed Action would result in direct, negligible, short-term negative impacts to wildlife as a result of loss of low value habitat due to the new houses and utility systems.

4.3.4 Threatened and Endangered Species

The Desert Tortoise Recovery Plan shows that the proposed construction area is within designated desert tortoise critical habitat. A threatened and endangered species survey conducted in September 2014 indicates no long-term use by desert tortoise of the KHA. This is likely reflective of the history of human disturbance at the project site. Although it is likely desert tortoises occasionally disperse through the project site, they do not take up residence. The Proposed Action would have direct, short-term, minor impacts to this threatened species.

The KHA falls within designated critical habitat for the desert tortoise. Even so, the site has, at best, marginal habitat because of persistent human use over time; the permanent loss of 1.4 acres is likely of minor magnitude. Key physical features of desert tortoise habitat that support burrows will not be disturbed or removed.

4.3.5 Cultural Resources

The No Action alternative would not impact the historic integrity of the property as it does not address treatment and preservation of the historic resources at Kelso Housing facility.

The Proposed Action alternative would remove the existing trailer and build the new houses, main utility area, and septic infiltration field in an area removed from the historic corral, thus there would be no impact to historic resources. For all aspects of the projects, ground disturbance would be voided and minimized by conducting a pre-construction reconnaissance survey of all construction sites and monitoring ground disturbing activities by a qualified archaeologist. In the event that archaeological resources are uncovered, the ground disturbance will halt and the State Historic Preservation Office will be consulted.

In conclusion, implementation of the Proposed Action would provide a positive impact from 24 hour presence of staff living and working in the Kelso vacinity to protect the historic resources in the Kelso area. The No Action alternative will not impact the historic resources of the site. The Proposed Action alternative also has the potential for direct impacts to undiscovered archaeological resources at the housing site, although this risk will be avoided and minimized to the extent possible through reconnaissance and monitoring of ground disturbing activities.

4.3.6 Park Operations

The trailers to be removed or vacated are used for employee housing for one law enforcement ranger. As previously described, this positions is a required occupancy under Mojave's Housing Management Plan.

The No Action alternative would remove the Kelso trailer but not build new housing to comply with NPS direction to removal trailers used as housing. There would be a significant lack of housing for employees because the four bedrooms provided by the existing trailer at Kelso would not be replaced. The consequences of No Action include effectively removing the presence of four positions from the central portion of Mojave and possibly relocating them to Baker. This would result in much greater response times to emergency situations as well as increased travel costs for these employees to perform work in the eastern half of the park. It would leave the NPS facilities at Kelso, including the visitor center comfort station, Historic Kelso Depot and School House at least a 30 minutes response drive away; increasing their vulnerable to theft or vandalism.

The Proposed Action would result in increased efficiencies by concentrating more facilities into one area. Also the new utility systems would be much more efficient and less prone to breakdown than the present utility systems at the three trailers pads. The new water tank would provide enough storage for potable water to serve the visitor center and expanded housing area at Kelso. The new housing and utility systems would also improve employee morale, possibly increasing retention and thus increasing operational continuity and reducing costs associated with hiring and training new employees.

In conclusion, the No Action alternative would result in major, direct, long-term negative impacts to park operations by removing employees residences, and law enforcement presence from the central portion of Mojave. The Proposed Action alternative would result in major, direct, long-term, positive impacts to park operations by retaining the presence of maintenance and law enforcement personnel, improving utility systems, and improving employee retention and morale.

Summary of Impacts

Table 3. Impact Matrix

	No Action alternative	Proposed Action alternative
Water Resources	negligible, long-term, indirect positive impacts to groundwater resources due to the reduction in groundwater use	minor, long-term, indirect, negative impacts to water resources due to the continuation of groundwater use
Vegetation	no impact	minor, long-term, direct, negative impacts to vegetation as a result of disturbance that would continue an on-going problem with non-native annual weeds
Wildlife	No to wildlife as a result of displacement of a few individual animals	negligible, short-term, direct, negative impacts to wildlife as a result of loss of low value habitat
Cultural Resources	Positive impact	Direct, positive impacts to the historic Kelso district because of the presence of NPS residents living in the area to help protect historic features. The proposed housing is outside of the Kelso Historic District associated with the Kelso Depot.
Park Operations	major, long-term, direct negative impacts to park operations by removing housing for four employees, including a law enforcement presence from the central portion of Mojave	major, long-term, direct, positive impacts to park operations by retaining the presence of staff, including a law enforcement personnel, improving utility systems, and improving employee retention and morale

5. Consultation and Coordination

The Fish and Wildlife Service is being consulted under Section 7 of the Endangered Species Act (7 U.S.C. 136; 16 U.S.C. 460 et seq (1973)). The project area includes critical habitat for desert tortoise although none are known to occur in this location and the habitat quality in the construction areas is compromised by the existing disturbance of the site and no take is anticipated.

The California State Historic Preservation Office is being consulted under Section 106 of the National Historic Preservation Act, as amended; 16 U.S.C. 470 et seq. (1966). Additionally the Chemehuevi Tribe is being consulted due to their long-standing relationship with the project site.

This environmental assessment will be made available for a 30-day public review in compliance with the National Environmental Policy Act; 42 U.S.C. 4321-4347 (1969). Following public review, comments received will be analyzed and a decision will be announced and implemented.

6. Distribution

Elected Officials
Government Agencies
Public Libraries

7. Preparers

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8. References

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