RECLAMATION

Managing Water in the West

Draft Environmental Assessment

North Kern Water Storage District Lerdo/Calloway Canal Intertie Project

EA-09-107

U.S. Department of the Interior
Bureau of Reclamation
Mid Pacific Region
South Central California Area Office
Fresno, California

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Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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List of Acronyms and Abbreviations

AB 32	Assembly Bill 32
APE	area of potential effects
CAA	Clean Air Act
CEC	Categorical Exclusion Checklist
CFR	Code of Federal regulations
cfs	cubic feet per second
Corps	U.S. Army Corps of Engineers
CNDDB	California Natural Diversity Data Base
CVP	Central Valley Project
CWA	Clean Water Act
EA	Environmental Assessment
EPA	Environmental Protection Agency
FKC	Friant-Kern Canal
FWA	Friant Water Authority
FWS	U.S. Fish and Wildlife Service
FWCA	Fish and Wildlife Coordination Act
GHG	greenhouse gases
IRWMP	Integrated Regional Water Management Plan
IS	Initial Study
ITA	Indian Trust Assets
MBTA	Migratory Bird Treaty Act
ND	Negative Declaration
NHPA	National Historic Preservation Act
NKWSD	North Kern Water Storage District
NRHP	National Register of Historic Places
PM_{10}	particulate matter less than 10 microns in diameter
Poso Group	Poso Creek Regional Water Management Group
RCP	Reinforced Concrete Pipe
Reclamation	U.S. Bureau of Reclamation
Recovery Act	American Recovery and Reinvestment Act of 2009
ROW	right-of-way
SJVAB	San Joaquin Valley Air Board
SJVAPCD	San Joaquin Valley Air Pollution Control District
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
State	State of California
SWP	State Water Project
TDS	total dissolved solids
U.S.	United States

Section 1 Purpose and Need for Action

1.1 Background

The North Kern Water Storage District (NKWSD) was formed in 1935 and is located north of the Kern River in the southern end of the San Joaquin Valley. The district lies between the City of Bakersfield on the south and the City of Delano on the north, and between Highway 99 on the east and the cities of Wasco and Shafter on the west (Figure 1). In the 1950s, NKWSD constructed a system of recharge and extraction facilities to regulate its highly variable Kern River supplies. About this same time, NKWSD joined with five other neighboring water agencies to form the Poso Creek Regional Water Management Group (Poso Group) and collectively prepared an Integrated Regional Water Management Plan (IRWMP), which was adopted by each participating agency in July 2007 (GEI, 2007). The motivation was twofold: 1) use of a common groundwater basin, and 2) significantly reduced reliability of the principal sources of water supplies available to the region (Kern River, State Water Project {SWP}, and Central Valley Project {CVP} supplies). NKWSD's highly successful conjunctive-use facilities and operations were noted by the Poso Group as a significant regional asset, inasmuch as there has been unused capacity in NKWSD's spreading ponds and that the district is favorably located with regard to recharge of a common groundwater basin. Accordingly, the IRWMP identified several projects within the region that could help the Poso Group better manage their varied water resources, one of them being the maximized use of NKWSD's conveyance facilities and recharge and extraction facilities.

There are three main conveyance facilities within NKWSD; the district's Calloway and Lerdo Canals, and the Bureau of Reclamation's (Reclamation) Friant-Kern Canal (FKC), all of which have a general north-south orientation and generally parallel one another. The Lerdo Canal is situated at a higher elevation (along the east side of the district) than the Calloway Canal (along the west side of the district) with the FKC located in between (Figure 1). NKWSD also has an unlined canal, referred to as the "8-1 Lateral", which conveys water via gravity from the Lerdo Canal to the Calloway Canal (a distance of about 1.5 miles) in an east-west orientation and crosses under the FKC at milepost 144.85. There is also a turnout from the FKC into the 8-1 Lateral near this location at milepost 144.87 (Figure 2). Currently, there is no way to convey water from the Calloway Canal or FKC to the Lerdo Canal. In addition to irrigation demand, the Lerdo Canal serves significant water spreading ponds that cannot be reached from the Calloway Canal or FKC. In order to convey surface water to the spreading ponds on the east side of NKWSD, the district proposed to build a pumping plant and increase the capacity of its 8-1 Lateral that would allow water to be conveyed bilaterally between the Calloway Canal, FKC, and the Lerdo Canal. As a result, NKWSD prepared an Initial Study (IS) and adopted a Negative Declaration (ND) in February 2006 (North Kern, 2006). NKWSD approached Reclamation in November 2008 with a request to construct a siphon undercrossing the FKC in between mileposts 144.85 and 144.86. Reclamation completed a Categorical Exclusion Checklist (CEC) in July 2009 for the siphon undercrossing the FKC. Before the district started construction of their project, an opportunity for funding assistance was presented due to a Federal legislation brought about, in part, by the current state of the nation's economy.

The American Recovery and Reinvestment Act (Recovery Act) of 2009 is a bill signed into law by President Barack Obama on February 17, 2009 in an effort to jumpstart the nation's economy, create and/or save jobs, and foster unprecedented levels of accountability and transparency in government spending (Recovery 2009). The Department of the Interior has been tasked with managing $3 billion in investments as part of the Recovery Act, of which Reclamation will devote $260 million for projects in the State of California (State) to expand water supplies, repair aging water infrastructure, and mitigate the effects of a devastating drought that the State is currently experiencing (Interior 2009). Through a Challenge Grant, Reclamation provides 50/50 cost-share using Recovery Act funds for approved projects focused on water conservation, efficiency, and marketing.

NKWSD applied for and was selected as a potential recipient to receive a Recovery Act-funded Challenge Grant to help with the construction of their Lerdo/Calloway Canal Intertie Project (Proposed Action). Among several provisions set forth in the Recovery Act-funded Challenge Grant, NKWSD must complete the Proposed Action by September 30, 2010 in order to receive the full 50/50 cost-share funding. As part of the Proposed Action, the FKC has to be dewatered and temporarily shut down in order to construct the portion of the project underneath the FKC. The Friant Water Authority (FWA), on Reclamation's behalf, has operations and maintenance responsibilities over the FKC and normally dewaters the FKC every three years during the late winter months (usually late November and December). The FWA would, at times, dewater the FKC for emergencies or for special requests. In order to complete the Proposed Action before September 30, 2010, NKWSD asked Reclamation and the FWA to dewater the FKC during the 2009 winter period so that construction of only the siphon portion undercrossing the FKC could begin. Since Reclamation had already completed a CEC for the siphon undercrossing, the FKC was dewatered in November and December 2009 and construction of only the siphon undercrossing portion of the Proposed Action was completed. The FKC was restored and fully functional by January 1, 2010.

1.2 Purpose and Need

The primary purpose of the Proposed Action is to mitigate the loss of water supply reliability to NKWSD and ultimately to the region by maximizing the use of wet-year water supplies to recharge the underlying groundwater basin. The need results from a number of actions which have served to reduce the historical reliability of water supplies available to the region. The IRWMP identified "water supply reliability" as the number one issue/challenge facing the Poso Group, owing to actions which have adversely affected (or would adversely affect) all three of the region's principal sources of surface water, including the following:

- State and Federal regulatory measures in the Sacramento-San Joaquin Delta, which affect the SWP and CVP.
- Allocation of water to environmental purposes as a result of the San Joaquin River Restoration Agreement, which affects the CVP.
- Expiration (in 2012) of long-term contracts that have provided for the delivery of Kern River water supplies to the region with the City of Bakersfield.

As a result of these actions, the IRWMP projected that the region's historical surface water supplies would be reduced on the order of 100,000 acre-feet per year on average over the long term, which represents about 15 percent of the surface water supplies historically available to the region.

1.3 Scope

This Environmental Assessment (EA) is being prepared to analyze the impacts of constructing and operating the Lerdo/Calloway Canal Intertie and pumping plant. The Proposed Action would take place in Kern County within NKWSD, and span across Township 28 South, Range 26 East, Sections 25 and 26, and Township 28 South, Range 27 East, Sections 30 and 21.

1.4 Potential Issues

This EA will analyze the affected environment of the Proposed Action in order to determine the potential and cumulative impacts to the following resources:

- Water Resources
- Land Use
- Biological Resources
- Cultural Resources
- Indian Trust Assets (ITA)
- Socioeconomic Resources
- Environmental Justice
- Air Quality
- Global Climate Change

1.5 Related Environmental Documents

The following are relevant environmental documents that were completed prior to this EA, and which are referred to within this document and are hereby incorporated by reference.

- *CEC-08-88, Installation of 108" Siphon under the Friant-Kern Canal*. U.S. Bureau of Reclamation, Fresno, California. July, 2009. Note: Reclamation completed a Note to File in November 2009 as a result of a change in the siphon's diameter from 108" to 96".

- *IS/ND, Environmental Aspects of the 2006 System Operations Improvement Project*. North Kern Water Storage District, Kern County, California. February, 2006.

- *Poso Creek Integrated Regional Water Management Plan*, Poso Creek Regional Water Management Group. GEI Consultants, Inc.; July, 2007.

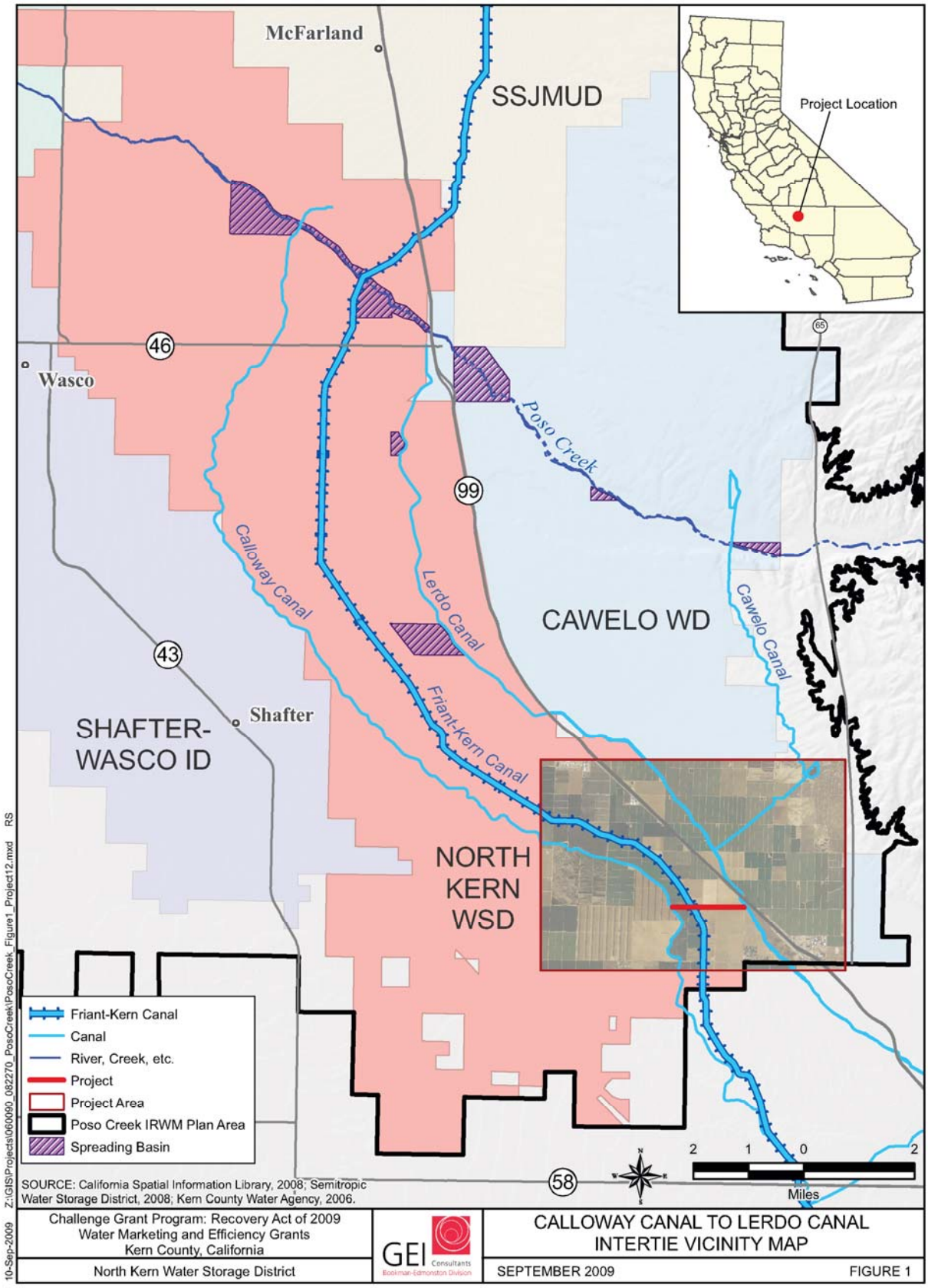

Figure 1. Project Overview Map

Figure 2. Overview of the three main conveyance facilities within NKWSD

Section 2 Alternatives Including Proposed Action

This EA considers two possible actions: the No Action Alternative and the Proposed Action. The No Action Alternative reflects future conditions without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment that would result from implementation of the Proposed Action.

Absent of federal funding assistance, the project to construct the Lerdo/Calloway Canal Intertie and pumping plant would, at a minimum, be delayed. It is NKWSD's intent to eventually construct and operate the project; however, the timing would be speculative. Further, there is always the chance that the project would never be built. With that said, the No Action Alternative could have two possible scenarios: A) no change from existing conditions as the project would not be built; or B) no change from existing conditions for at least a period of time, where the length of time is unknown, after which the project would be built as described in Section 2.2 below and the impacts analyzed in Section 3 of this EA would be realized. In addition, NKWSD prepared and completed an IS/ND for the project prior to applying for the

Recovery Act-funded Challenge Grant, which analyzed the environmental impacts of constructing and operating the Lerdo/Calloway Canal Intertie and pumping plant. Any other subsequent actions caused by scenario B of the No Action Alternative not already covered under Section 2.2 of this EA or NKWSD's IS/ND is speculative at best, is outside the scope of this EA, and may require additional environmental analysis. As a result, scenario A of the No Action Alternative will be analyzed from this point forward in order to reduce repeating information since scenario B mirrors the Proposed Action (but at a later date).

2.1 No Action Alternative

Under the No Action Alternative, Reclamation would not award a Recovery Act-funded Challenge Grant to NKWSD that would partially fund construction and operation of the Lerdo/Calloway Canal Intertie and pumping plant. The 8-1 Lateral would continue to operate in the gravity direction, by conveying water from NKWSD's Lerdo Canal to the Calloway Canal and by conveying water from the FKC to the Calloway Canal. Conditions would remain the same as existing conditions.

2.2 Proposed Action

Reclamation proposes to award NKWSD with a Recovery Act-funded Challenge Grant to assist with funding the construction of the Lerdo/Calloway Canal Intertie and pumping plant. Generally, the Proposed Action would involve replacement of that portion of the 8-1 Lateral lying east of the FKC (about one mile in length) with a 96-inch diameter buried pipeline (to facilitate pumping water from the Calloway Canal and FKC into the Lerdo Canal); construction of a pumping plant on the immediate west side of the FKC (to lift water in the reverse direction to the Lerdo Canal through the new pipeline); and enlargement of the 8-1 Lateral between the FKC and the Calloway Canal (to increase its capacity and to facilitate reversing the flow in this reach). All of these improvements would have a design capacity of about 400 cubic feet per second (cfs). Figure 2 shows the relationship of these canals in the area of the proposed construction, and Appendix A includes an aerial view, followed by site photographs which are keyed to the aerial.

More specifically, construction activities would include the following (listed from west to east):

- Removal and disposal of three existing 48-inch diameter pipes that connect the Calloway Canal to the 8-1 Lateral. The existing pipes would be replaced with two 120-inch reinforced concrete pipes (RCP) about 32 feet in length.

- Modification of roughly 1,600 feet of the 8-1 Lateral (extending from the Calloway Canal to the pumping plant) to accommodate a design flow of 400 cfs. In particular, the existing 8-1 Lateral would be deepened such that the new canal invert would match the Calloway Canal invert. The modified canal would have a bottom width of 20 feet with 2:1 side slopes, and would be concrete lined. Deepening the canal would result in an increase of about 10 feet in the top width of the canal. Excavated material would be on the order of 7,000 cubic yards and be used for backfill of the 8-1 Lateral east of the FKC. It is expected that an excavator and scraper would be used to accomplish the earth-

moving activities involved in reshaping the canal prism. The lining would involve the use of concrete delivery trucks and pumping equipment.

- Construction of a pumping plant, located immediately west of the FKC, with an ultimate design capacity of 400 cfs to lift water from the Calloway Canal and/or FKC to the Lerdo Canal. The pumping plant would be an open-sump type (constructed of reinforced concrete), with vertical pumps and motors, which would be housed outdoors. Each pump discharge would have a check valve, air valve, and butterfly valve and would be connected to a 96-inch steel manifold. There would be one 48-inch butterfly valve, one 36-inch ball valve, and one 16-inch ball valve connected to the manifold pipe to allow gravity flow from the Lerdo Canal through the pipeline and back into 8-1 Lateral. A flow meter would be installed to provide total and instantaneous flow readings. Excavation would involve about 5,000 cubic yards of material. Excavation work would likely include use of an excavator, with placement of structure backfill involving use of an excavator, loader, and compaction equipment.

- Abandonment of the existing 63-inch RCP siphon under the FKC at milepost 144.85 for the 8-1 Lateral. Existing concrete canal transitions on each side of the siphon would be demolished and removed. Backfill would involve about 900 cubic yards of material.

- Installation of a 96-inch steel pipeline for the pumping plant discharge manifold and the siphon undercrossing the FKC (at milepost 144.86). The steel pipeline would be installed to a point located just beyond the east line of Reclamation's FKC right-of-way (ROW). The construction would be accomplished when the FKC is dewatered to accommodate other maintenance activities by the FWA. Excavation and backfill operations would involve on the order of 6,200 cubic yards of material. Excavation would rely primarily on an excavator, with compaction involving use of an excavator, loader, and suitable compaction equipment. Pipe would be placed in the excavation using a suitable crane. Concrete lining would be replaced through hand-lining operations, with concrete delivery trucks and pumping equipment. As mentioned earlier in Section 1, this portion of the Proposed Action has already been completed and was analyzed under CEC-08-88.

- Installation of a 96-inch diameter RCP from the FKC crossing and continuing for about 5,350 feet to the head of the 8-1 Lateral at the Lerdo Canal. The new buried pipeline would replace the 8-1 Lateral and would be located within the existing canal ROW. There would be about four feet of earth cover over the top of the pipeline, and pipe trench excavation and backfill would involve on the order of 20,000 cubic yards. Pipe trench excavation would primarily rely on an excavator, while backfill operations would likely be conducted with a combination of an excavator and a loader. The pipeline sections would be delivered on flatbed trucks and placed into the trench using a crane of suitable size. Excavated materials would be stored on site (parallel to the trench) until backfilled. Surplus materials would be taken off site for safe storage, use, and/or disposal. Removal of surplus materials would likely be accomplished with a loader and dump trucks.

- Construction of a 40-foot wide culvert weir inlet/outlet structure with a 120-inch RCP pipe to connect the Lerdo Canal to the 96-inch RCP pipeline. The existing turnout structure and piping would be removed and disposed of as appropriate.

Plan and profile drawings are included in Appendix B, which indicate these improvements. The total of all excavation would be on the order of 40,000 cubic yards. Construction of these improvements would require the acquisition of both temporary and permanent ROW by NKWSD. Acquisition of permanent ROW is estimated at less than one acre, and temporary ROW is estimated at about 17 acres. The additional permanent ROW is at the location of the pumping plant, while the temporary ROW would facilitate replacement of the 8-1 Lateral with a buried pipeline (to the east of the FKC) and construction of improvements to the 8-1 Lateral (to the west of the FKC).

2.2.1 Environmental Protection Measures

NKWSD would implement the following environmental protection measures to reduce environmental consequences associated with the Proposed Action (Table 1). Environmental consequences for resource areas assume the measures specified would be fully implemented.

Table 1. Environmental Protection Measures

Resource	Protection Measure
Biological Resources	United States Fish and Wildlife Service (FWS) approved pre-construction protocol level surveys for San Joaquin kit fox shall be conducted no fewer than 14 days and no more than 30 days prior to the onset of any ground-disturbing activity (FWS 1999). In the event that San Joaquin kit fox are detected during preconstruction surveys, NKWSD would follow Standardized Recommendations for Protection of the San Joaquin kit fox Prior to or During Ground Disturbance (FWS, 1999).
Biological Resources	A protocol-level preconstruction burrowing owl survey shall be conducted within 250 ft of areas subject to disturbance no fewer than 14 days and no more than 30 days prior to start of construction according to established guidelines (CDFG 1995). Appropriate avoidance, minimization, or protection measures shall be determined in consultation with the California Department of Fish and Game in the event an active nest is located in an area subject to disturbance, or within the typical setback (i.e., occupied burrows or nests within 150 feet of an area subject to disturbance during the non-breeding season, or within 250 ft of an area subject to disturbance during the breeding season (February 1 through August 31)).
Air Quality	Implement control measures for construction emissions of particulate matter less than 10 microns in diameter (PM_{10}) according to the San Joaquin Valley Air Pollution Control District's (SJVAPCD) Regulation VIII (SJVAPCD, 2009). One measure includes the use of water with all "land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities" for fugitive dust suppression.

Section 3 Affected Environment & Environmental Consequences

This section identifies the potentially affected environment and the environmental consequences involved with the Proposed Action and the No Action Alternative, in addition to environmental trends and conditions that currently exist.

3.1 Water Resources

3.1.1 Affected Environment

North Kern Water Storage District

NKWSD conjunctively uses surface water and groundwater to meet the irrigation water demands of its landowners. In particular, the district's highly variable surface water supply is regulated, in part, in the underlying groundwater basin. The surface water which is placed in groundwater storage is subsequently pumped by both the district and its landowners to meet agricultural irrigation water needs. NKWSD district does not provide municipal and industrial water. While the irrigation water needs vary from year to year, it is on the order of 180,000 acre-feet per year. There are no apparent long-term trends toward increasing or decreasing irrigated acreage; accordingly, the applied water demand is not expected to change significantly in the foreseeable future. Any shift in land use from agriculture to urban uses would be relatively slow in coming; accordingly, agricultural water demand can be expected to dominate water demands in NKWSD for some time to come. The district's main conveyance facilities include the Lerdo and Calloway Canals, and the 8-1 Lateral as previously described in Section 1.

NKWSD's primary source of surface water is the Kern River, whose waters have been utilized under a schedule of long-standing diversion rights, including the ability to store and re-regulate its supply in Isabella Reservoir. NKWSD also has a contract with the City of Bakersfield for 20,000 acre-feet per year of Kern River supplies through 2012. These supplies have been supplemented from time to time by water from Poso Creek, which transverses the northern portion of the district and contributes, primarily through infiltration, to the underlying groundwater basin. In addition, while NKWSD does not have a long-term contract for the diversion and use of CVP water, from time to time water has been diverted from the FKC into Poso Creek under short-term arrangements with Reclamation. Historically, this has occurred under very "wet" circumstances, with the water being used primarily for direct groundwater recharge. Other surface water supplies include oilfield waste water, and other smaller creeks.

NKWSD's surface water supplies have ranged from less than 10,000 acre-feet in a "dry" year to nearly 400,000 acre-feet in a very "wet" year. Owing to its highly variable Kern River supply, the district has had to regulate available surface water supplies from times of surplus ("wet" years) to times of need ("dry" years). This regulation has been accomplished, to a large extent, through use of the underlying groundwater basin. For the purpose of groundwater recharge, NKWSD principally makes use of about 1,500 acres of spreading ponds. In "wet" years, more than 200,000 acre-feet of water has been directed into the spreading ponds. During "dry" years, deliveries of surface water to irrigation are greatly reduced and groundwater pumping is

significant. While extraction of groundwater by means of district wells has been zero in many years, it has ranged up to about 100,000 acre-feet in one year.

Groundwater Subbasin

The southern San Joaquin Valley is located within the Tulare Lake Hydrologic Region, which is essentially a closed basin, with principal drainages from the Kings, Kaweah, Tule, and Kern Rivers. These streams are the principal source of natural recharge to the underlying groundwater basin with applied irrigation also being a large contributor. The California Department of Water Resources has designated seven subbasins within the Tulare Lake Hydrologic Region: one of them being the Kern County subbasin (DWR 2006). The Kern County groundwater subbasin has been identified as being critically overdrafted (DWR 2005). Heavy reliance on groundwater pumping for irrigation was a big factor; however, the importation of surface water supplies from both the SWP and CVP appears to have stopped and/or slowed this decline and the average Kern County groundwater subbasin level is essentially unchanged from 1970 to 2000 (DWR 2006). Between 1926 and 1970, groundwater extraction has resulted in more than eight feet of subsidence in the north-central portion of the subbasin, and approximately nine feet in the south-central area (Ireland et. al. 1984).

NKWSD is located within the Kern County subbasin. Groundwater well depths in NKWSD range from 800 to 1,200 feet, with about 400 to 500 feet of perforations being typical. Agricultural well yields range from less than 1,000 gallons per minute up to about 3,000 gallons per minute. In general, since 1977, groundwater levels underlying the district have increased during "wet" periods and decreased during "dry" periods. NKWSD's average depth to groundwater in 1986, at the end of a wet period, was about 200 feet. In 1993, at the end of a dry period, the average depth was about 280 feet.

Water Quality

The surface water sources and the groundwater underlying NKWSD are generally of good quality. The Kern River, the main source of NKWSD's surface water supply, exhibits mineral quality which is excellent in all respects, with total dissolved solids (TDS) concentration averaging about 100 milligrams per liter. The quality of the CVP water conveyed in the FKC is equal to or better than the quality of the Kern River. Water quality data for the FKC indicates an average TDS of 45 milligrams per liter for the period 1957 to 2000. Records indicate that there has not been much fluctuation in the quality of Kern River and FKC supplies.

In general, groundwater quality throughout the region is suitable for most municipal and agricultural uses, with only local impairments. The primary constituents of concern for municipal uses are arsenic and nitrate, while salinity TDS is the primary area of concern for agricultural uses. Owing to both its location and its high-quality surface water supplies, arsenic concentrations are not an issue in the groundwater underlying NKWSD; however, there are localized areas of elevated nitrate concentrations. In addition, salinity is relatively low in most of NKWSD and does not present a constraint on agricultural uses; however, similar to nitrate, there are localized areas of elevated TDS, which either affect crop choice or require blending of surface water and groundwater supplies.

Central Valley Project Facilities

Friant-Kern Canal The FKC carries water over 151.8 miles in a southerly direction from Friant Dam to its terminus at the Kern River, four miles west of Bakersfield. The FKC has an initial capacity of 5,000 cfs that gradually decreases to 2,000 cfs at its terminus in the Kern River (Reclamation, 2010). The water conveyed in the FKC is from the San Joaquin River and is considered to be of good quality because it originates from the Sierra Nevada. The FKC is a part of the CVP and annually delivers about seven million acre-feet of water for agricultural, urban, and wildlife purposes in Fresno, Tulare, and Kern Counties.

3.1.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the existing conveyance facilities would be utilized under their current conditions. Any available water from the Calloway Canal and FKC would remain incapable of being moved to the Lerdo Canal which would preclude the delivery of such water to both irrigation demands and spreading ponds reachable only from the higher-elevation Lerdo Canal. The spreading ponds served exclusively by the Lerdo Canal would remain stranded assets relative to available surplus CVP water from the FKC, which occurred most recently in 2006. Without this additional recharge, groundwater level conditions within the region could worsen and the benefits to groundwater quality from blending with good-quality surface water supplies would not be realized. Ground subsidence could exacerbate without additional recharge of the underlying groundwater subbasin.

Proposed Action

The Proposed Action would result in improvements to NKWSD's main conveyance facilities that would help the district better serve water to its in-district customers. The FKC would not be impacted (as analyzed in CEC-08-88) and Reclamation's obligation to deliver CVP water to its contractors would not be impacted. The FKC has already been restored and functioning as normal after it was dewatered and temporarily shut down for construction of the siphon undercrossing portion of the Proposed Action.

The Proposed Action would not generate a new supply of water; rather, it would improve the reliability of NKWSD and the region's water supplies by using available surplus surface water to recharge the Kern County groundwater subbasin for later use when groundwater pumping is necessary. The Proposed Action does not include additional groundwater pumping; rather, it would help to mitigate the water-level impacts of associated with existing groundwater pumping. In particular, the increased ability to recharge available surface water supplies would help to mitigate the projected long-term decline in groundwater levels. Since the surface water supply has a lower salinity level than the existing groundwater, the long-term infiltration of these surface water supplies would serve to maintain and enhance the generally good quality of groundwater underlying the district area. Also, the additional recharge of the groundwater basin would help reduce any further impacts to ground subsidence. Therefore, the Proposed Action would have slight beneficial impacts to NKWSD and the region's varied water resources.

Cumulative Impacts

As in the past, hydrological conditions and other factors are likely to result in fluctuating water supplies. When added to other factors that may affect a district's water supplies such as those

listed in the Purpose and Need, the desire to maximize any available water supplies are the driving force for actions like the Proposed Action. Water districts aim to provide water to their customers based on available water supplies and timing, all while attempting to minimize costs. Farmers irrigate and grow crops based on these conditions and factors, and a myriad of water-related actions are approved and executed each year to facilitate water needs. Each water-related action involving Reclamation undergoes environmental review prior to approval; however, Reclamation does not have approval authority over other water-related actions such as those involving the SWP and groundwater pumping.

NKWSD is currently engaged in two water banking projects: one with Kern-Tulare Water District and another with Delano-Earlimart Irrigation District. Under these separate projects, which Reclamation has analyzed in separate EAs and which are hereby incorporated by reference, NKWSD would bank each respective district's surplus CVP supplies (diverted off of the FKC) through its spreading ponds and, upon request, would extract groundwater for return to the district at a later date (Reclamation 2006, 2009). The Proposed Action would not adversely impact either banking project; it would make NKWSD's eastside spreading ponds (currently inaccessible from the FKC) with unused capacity available for additional recharge. Further, NKWSD's immediate neighbor to the east, Cawelo Water District, has recently developed a significant spreading area that can only be accessed from the Lerdo Canal with imported water supplies. The combination of NKWSD's eastside spreading ponds and Cawelo Water District's spreading ponds represent significant direct recharge assets that are not accessible to CVP water under present conditions.

The Proposed Action, when taken into consideration with other similar existing and proposed projects, would improve water resources management in NKWSD and the region. There would be a cumulative positive impact on groundwater levels and quality, owing to the long-term, increased groundwater recharging capability during times of surface water supply availability.

3.2 Land Use

3.2.1 Affected Environment

North Kern Water Storage District

Most of the irrigable lands in the southern San Joaquin Valley portion of Kern County is developed to irrigated agriculture or supporting uses, and NKWSD is no exception. Supporting uses include canals and water spreading ponds. While NKWSD has been essentially fully developed to irrigated agriculture for many years, there has been a trend away from annual crops in favor of permanent crops. Based on a land use survey conducted in 2007, the gross irrigated area for the district as a whole was about 55,600 acres (including 4,800 acres of fallow ground) out of about 70,000 total acres. About one-third of the irrigated acreage was developed to row crops, or fallow. Principal row crops included cotton, wheat, and alfalfa, which collectively comprise about two-thirds of all row crop acreage. Similarly, the two principal permanent crops are almonds, grapes, and stone fruit, which together account for about 87 percent of all acreage developed to permanent crops.

Improvements under the Proposed Action would be located in a rural agricultural area surrounded by actively cultivated land. The site is located one mile north of Seventh Standard Road to the immediate west of State Highway 99 and spans a length of about 1.5 miles between the Calloway and Lerdo Canals.

3.2.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, no changes to land use would occur and NKWSD's facilities would continue to operate as they have in the past to support existing irrigated agriculture.

Proposed Action

Construction improvements would replace the open 8-1 Lateral portion east of the FKC with a buried pipeline, which would eliminate the impediment that the existing canal presents to north-south travel. To the west of the FKC, the 8-1 Lateral would be improved, but would otherwise remain in use. The pumping plant, which would be located immediately west of the FKC, would be used to support the area's irrigated agriculture and is typical of many pumping plants located throughout the southern San Joaquin Valley. Finally, the Proposed Action would not support development of additional lands to irrigated agriculture, since the area is essentially fully developed to irrigated. Accordingly, the main purpose of the Proposed Action would be to deliver water to spreading ponds for recharge purposes; therefore, there would be no adverse impacts to existing land use.

Cumulative Impacts

In recent years, land use changes to the south of NKWSD have involved the urbanization of agricultural lands. These types of changes are typically driven by economic pressures and they are as likely to occur without the Proposed Action as with it. Accordingly, no cumulative impacts to land use are anticipated.

3.3 Biological Resources

3.3.1 Affected Environment

The Proposed Action involves construction in a rural agricultural area that has been intensively farmed for several decades. The construction footprint includes the ROW associated with NKWSD's 8-1 Lateral and the immediately adjoining cultivated land (through the acquisition of both permanent and temporary ROW), as well as the crossing of the FKC ROW (Appendix A Site Photos 1-6). There is no natural habitat remaining on the canal ROW or the immediately adjoining farmland and therefore, suitable habitat for special-status species is absent or uncommon.

The following list (Table 2) of federally listed, proposed, and candidate species was obtained on January 11, 2010 by accessing the FWS Database: http://www.fws.gov/sacramento/es/spp_lists/auto_list_form.cfm (document number 100111123422). The list is for the following 7 ½ minute U.S. Geological Survey Quadrangles, which are overlapped by the Project Area: Oildale, Rosedale, Stevens, Gosford, Rio Bravo, Tupman, Famoso, North of Oildale, and Wasco quadrangles. Bird species that might occur in

Kern County were also included in the list (Table 2). The California Natural Diversity Database (CNDDB) was also searched for special-status species and their location within the project area.

Table 2. Federally listed species with the potential to be present within or near the Project Area.

Common Name	***Scientific Name***	***Status[1]***	***Effects[2]***	***Occurrence in the Study Area[3]***
Amphibians				
California red-legged frog	*Rana aurora draytonii*	T	NE	**Absent.** No individuals or habitat in area of effect.
Birds				
California condor	*Gymnogyps californianus*	E, X	NE	**Absent**. No CNDDB[4]-recorded occurrences in project area. Study area is not within areas designated as critical habitat.
Least Bell's vireo	*Vireo bellii pusillus*	E	NE	**Absent.** No individuals or habitat in area of effect.
southwestern willow flycatcher	*Empidonax traillii extimus*	E, X	NE	**Absent.** No individuals or habitat in area of effect. Study area is not within areas designated as critical habitat.
Swainson's hawk	*Buteo swansoni*	MBTA	NE	**Absent.** No CNDDB-recorded occurrences in project area. No suitable nesting habitat will be affected by the project.
Western burrowing owl	*Athene cunicularia*	MBTA	NE	**Possible**. CNDDB records indicate this species occurs within a 5-mile radius of the project area. The site could be used for burrowing and as foraging habitat. North Kern shall implement environmental protective measures as listed in Section 2.2.1.
western snowy plover	*Charadrius alexandrinus nivosus*	T	NE	**Absent.** No individuals or habitat in area of effect.
Fish				
delta smelt	*Hypomesus transpacificus*	T	NE	**Absent**. No natural waterways within the species' range will be affected by the proposed action.
Invertebrates				
valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T	NE	**Absent.** No individuals or habitat in area of effect.
vernal pool fairy shrimp	*Branchinecta lynchi*	T	NE	**Absent.** No individuals or vernal pools in area of effect.
Mammals				
Buena Vista Lake shrew	*Sorex ornatus relictus*	E	NE	**Absent.** No individuals or habitat in area of effect.

giant kangaroo rat	*Dipodomys ingens*	E	NE	**Absent.** No individuals or habitat in area of effect. Disturbed agricultural lands do not provide habitat.
San Joaquin kit fox	*Vulpes macrotis mutica*	E	NE	**Possible**. CNDDB records indicate this species occurs in the project area. The area could possible be used for denning or as foraging habitat. North Kern shall implement environmental protective measures as described in Section 2.2.1.
Tipton kangaroo rat	*Dipodomys nitratoides nitratoides*	E	NE	**Absent.** No individuals or habitat in area of effect. Disturbed agricultural lands do not provide habitat.
Plants				
Bakersfield cactus	*Opuntia treleasei*	E	NE	**Absent.** Does not inhabit croplands or lands fallowed and untilled for less than three vears
California jewelflower	*Caulanthus californicus*	E	NE	**Absent.** CNDDB records indicated this species is extirpated from area.
Kern mallow	*Eremalche kernensis*	E	NE	**Absent.** No individuals or habitat in area of effect.
San Joaquin woolly-threads	*Monolopia congdonii*	E	NE	**Absent.** CNDDB records indicated this species is believed extirpated from area. Not expected to occur close enough to croplands to colonize bare
Reptiles				
blunt-nosed leopard lizard	*Gambelia sila*	E	NE	**Absent.** No individuals or habitat in area of effect.
giant garter snake	*Thamnophis gigas*	T	NE	**Absent.** Species believed to have been extirpated from Tulare Basin.

1 Status= Listing of Federally special status species, unless otherwise indicated
E: Listed as Endangered
MBTA: Birds protected by the Migratory Bird Treaty Act
T: Listed as Threatened
X: Critical Habitat designated for this species
2 Effects = Effect determination
NE: No Effect anticipated from the Proposed Action to federally listed species
3 Definition Of Occurrence Indicators
Possible: Species or habitat recorded in area
Absent: Species not recorded in study area and/or habitat requirements not met
4 CNDDB = California Natural Diversity Database 2009

The action area consists of agricultural fields that provide some limited habitat value for the San Joaquin kit fox and perhaps the Western burrowing owl. Otherwise, the affected area does not provide habitat for special-status species (Table 2). There is no critical habitat in the affected area.

Western Burrowing Owl

Although not a federally protected species, the burrowing owl is protected by the Migratory Bird Treaty Act (MBTA). This small ground-dwelling owl is a year-long resident that exhibits high site fidelity. They live in ground squirrel and other mammal burrows that it appropriates and enlarges for its own purposes (Martin 1973, CDFG 1995). Burrowing owls are typically found in short-grass grasslands, open scrub habitats, and a variety of open, human-altered environments, such as the edges of canals or roadways, and agricultural fields. These owls are active day and night and are opportunistic feeders. Their diet includes insects, amphibians, reptiles, small mammals, and grass material. The nesting season for burrowing owls occurs from Feb. 1 - Aug. 31 (CDFG 1995).

Burrowing owls have shown significant declines throughout the State in recent years principally due to the conversion of grassland and pasturelands to agricultural and urban uses, and to poisoning programs to control California ground squirrels (*Spermophilus beecheyi*). Other hazards common to agricultural areas in the State that could impact burrowing owls include automobiles, barbed-wire fences, and electric fences (Gervais et al. 2008).

One occurrence of burrowing owl has been recorded in CNDDB records located two miles east of the Lerdo Canal project site (CNDDB 2009). This area has potential nesting habitat for burrowing owl. Therefore, burrowing owl has the potential to occur at the project site.

San Joaquin Kit Fox

The San Joaquin kit fox is federally listed as an endangered species. Their diet varies based on prey availability, and includes small to mid-sized mammals, ground-nesting birds, and insects. Kit foxes excavate their own dens, or would use other animals, and human-made structures (culverts, abandoned pipelines, and banks in sumps or roadbeds).

Kit foxes currently inhabit western and southern San Joaquin valley in grassland and scrubland communities. The project area is surrounded by orchards and alfalfa fields and occurs within the known range for San Joaquin kit fox. Primary reasons for the species decline include loss and degradation of habitat (FWS 1998), in addition to vehicular traffic associated with State Route 99 (CNDDB 2010).

There are several CNDDB-recorded occurrences of San Joaquin kit fox within five miles of the Project Area (CNDDB 2009). However, because the project area occurs in actively cultivated fields, habitat quality for kit fox would be poor (Warrick et al. 2007).

3.3.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, conditions would remain the same as described above. Reclamation would not provide grant funds for the construction of the Lerdo/Calloway Canal Intertie and pumping project. There would be no impacts to wildlife and special-status species as no new facilities would be constructed and historical operation and maintenance practices related to the 8-1 Lateral would continue.

Proposed Action

Under the Proposed Action, the potential for impacts to wildlife and special-status species would be limited, since the project would be largely constructed within the existing, disturbed ROW for NKWSD's 8-1 Lateral, with the exception of temporary construction easement on actively cultivated, adjacent land. There is the possibility that Western burrowing owl and the San Joaquin kit fox could utilize the project area for foraging or burrowing (Table 2).

Western Burrowing Owl

The Proposed Action could adversely affect the owl's survivorship or disturb their foraging habitat if the owls are along the edge of the road or canal (Gervais et al. 2008). Owls could also become disturbed from factors such as noise and vibration due to heavy equipment which could cause the owls to flee and result in nest failure as well as vehicular strikes. During construction, there is the potential that if owls are present along or near the canal, they could become buried inside burrows.

A survey for burrowing owls would be conducted prior to construction activities (CDFG 1995). If the survey indicates the presence of burrowing owls, then the mitigation measures to minimize impacts to burrowing owls, their burrows and foraging habitat would be followed (CDFG 1995). Followed mitigation measures include not disturbing occupied burrows during nesting season unless "approved by a biologist".

San Joaquin Kit Fox

The project area is surrounded by orchards and alfalfa fields, which could potentially provide habitat utilized by the San Joaquin kit fox (Warrick et al. 2007). It is possible that any habitat modification during construction could cause a negative impact to prey abundance or reduce the number of denning sites (USFWS 1998). Also, kit foxes could potentially be harassed or become buried in their dens. There is a potential beneficial effect, albeit probably minimal, as the conversion of an open canal to a buried pipe might remove a barrier to kit fox movement.

NKWSD would conduct pre-construction surveys for the kit fox at least 200 feet outside of the project area boundary 14 to 30 days prior to initiation of any ground disturbance or construction activity. If there is evidence of any dens or signs of the San Joaquin kit fox, the avoidance measures for construction and operational requirements, as outlined in the FWS Standardized Recommendations (FWS 1999), would be followed.

The Proposed Action would implement Environmental Protection Measures (Table 1) to avoid or minimize effects to special-status species. Prior to construction, a pre-activity survey would be conducted by a qualified biologist to ensure that the construction areas remain unoccupied by sensitive species and, during construction, standard avoidance and minimization protocols would be followed to avoid impacts. Therefore, the Proposed Action is expected to have No Effect to either the San Joaquin kit fox or Western burrowing owl.

Cumulative Impacts

Biological resources would continue to be affected by other types of activities that are ongoing but unrelated to the Proposed Action. Impacts to biological resources from the implementation of the Proposed Action would occur only during construction activities. The Proposed Action, when added to other existing and proposed actions, does not contribute to cumulative impacts to

wildlife resources since construction activities are short-term and would not result in any features that could impact movement of species.

3.4 Cultural Resources

A cultural resource is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. The National Historic Preservation Act (NHPA) of 1966 is the primary Federal legislation that outlines the Federal Government's responsibility to cultural resources. Section 106 of the NHPA requires the Federal Government to take into consideration the effects of an undertaking on cultural resources listed on or eligible for inclusion in the National Register of Historic Places (NRHP). Those resources that are on or eligible for inclusion in the NRHP are referred to as historic properties.

The Section 106 process is outlined in the Federal regulations at 36 Code of Federal Regulations (CFR) Part 800. These regulations describe the process that the Federal agency (Reclamation) takes to identify cultural resources and the level of effect that the proposed undertaking would have on historic properties. In summary, Reclamation must first determine if the action is the type of action that has the potential to affect historic properties. If the action is the type of action to affect historic properties, Reclamation must identify the area of potential effects (APE), determine if historic properties are present within that APE, determine the effect that the undertaking would have on historic properties, and consult with the State Historic Preservation Officer (SHPO), to seek concurrence on Reclamation's findings. In addition, Reclamation is required through the Section 106 process to consult with Indian Tribes concerning the identification of sites of religious or cultural significance, and consult with individuals or groups who are entitled to be consulting parties or have requested to be consulting parties.

3.4.1 Affected Environment

The San Joaquin Valley is rich in historical and prehistoric cultural resources. Cultural resources in this area are generally prehistoric in nature and include remnants of native human populations that existed before European settlement. Prior to the 18th Century, many Native American tribes inhabited the Central Valley. It is possible that many cultural resources lie undiscovered across the valley. The San Joaquin Valley supported extensive populations of Native Americans, principally the Northern Valley Yokuts, in the prehistoric period. Cultural studies in the San Joaquin Valley have been limited. The conversion of land and intensive farming practices over the last century may have destroyed many Native American cultural sites.

In the Fall of 2009, a cultural resources assessment was conducted, which included a pedestrian survey of the areas of ground disturbance, as well as an historical resource inventory and evaluation of the 8-1 Lateral (TG&S 2009). This work resulted in findings which including the following:

- No historic or prehistoric cultural resources were observed during the pedestrian survey or in either of two shovel test pits.
- No further cultural resources work is necessary unless unrecorded cultural resources are discovered during construction. If cultural resources are discovered during

construction, work must halt in the area of the discovery until the finds can be assessed by a qualified archaeologist.

- The 8-1 Lateral is not eligible for the NRHP or for the California Register of Historic Resources.

3.4.2 Environmental Consequences

No Action

Under this Alternative, there would be no impacts to cultural resources since there would be no change in operations and no additional ground disturbance. Conditions related to cultural resources would remain the same as existing conditions.

Proposed Action

Under the Proposed Action, construction would disturb existing canal rights-of-way and immediately adjacent farmland. Given the age of the 8-1 Lateral and the fact that about one mile of it would be replaced with installation of a pipeline, it was determined that consultation with SHPO is required. Subject to consultation with SHPO and confirmation of the conclusion that the 8-1 Lateral is not eligible for the NRHP or for the California Register of Historic Resources, it could be concluded that the Proposed Action would not result in impacts to cultural resources. Approval of the Proposed Action would not conclude until completion of the consultation.

Cumulative Impacts

Subject to the consultation with SHPO, the Proposed Action, when added to other existing and proposed actions, would not contribute to cumulative impacts to cultural resources.

3.5 Indian Trust Assets

ITA are legal interests in assets that are held in trust by the United States (U.S.) for Federally recognized Indian tribes or individuals. The trust relationship usually stems from a treaty, executive order, or act of Congress. The Secretary of the Interior is the trustee for the U.S. on behalf of Federally recognized Indian tribes. "Assets" are anything owned that holds monetary value. "Legal interests" means there is a property interest for which there is a legal remedy, such a compensation or injunction, if there is improper interference. ITA can not be sold, leased or otherwise alienated without the U.S.' approval. Assets can be real property, physical assets, or intangible property rights, such as a lease, or right to use something; which may include lands, minerals and natural resources in addition to hunting, fishing, and water rights. Indian reservations, rancherias, and public domain allotments are examples of lands that are often considered trust assets. In some cases, ITA may be located off trust land. Reclamation shares the Indian Trust responsibility with all other agencies of the Executive Branch to protect and maintain ITA reserved by or granted to Indian tribes, or Indian individuals by treaty, statute, or Executive Order.

3.5.1 Affected Environment

The nearest ITA is the Tule River Reservation approximately 40 miles northeast of the project location.

3.5.2 Environmental Consequences

No Action
Under the No Action Alternative, there would be no impacts to ITA as there would be no ground-disturbing activities and conditions would remain the same as existing conditions.

Proposed Action
There are no tribes possessing legal property interests held in trust by the U.S. in the lands involved with the Proposed Action; therefore, this action would have no effect on ITA.

Cumulative Impacts
The Proposed Action, when added to other existing and proposed actions, would not contribute to cumulative impacts to ITA, since the Proposed Action would have no effect on ITA.

3.6 Socioeconomic Resources

3.6.1 Affected Environment
Based on January 2007 estimates published by the California Department of Finance, the San Joaquin Valley portion of Kern County supported about 254,000 housing units and a population of about 725,000. According to the 2000 Census, median household income in the county was almost $33,000, with about 21 percent of the population falling below the poverty level.

Agriculture is the principal source of jobs in the region. Kern County ranked third among all counties in the State in 2007 for the total value of agricultural production, which topped $4 billion. Agriculture in the semi-arid southern San Joaquin Valley relies on irrigation, which in turn relies on water supply reliability. Over recent years, there has been a significant shift from annual crops to higher-value permanent crops in the region. In NKWSD, permanent crops presently account for over 75 percent of the district's irrigated acreage, which makes water supply reliability vital.

3.6.2 Environmental Consequences

No Action Alternative
As discussed previously in Section 1.2, water supply reliability in NKWSD and the region has been and is projected to be further impacted. Under the No Action Alternative, NKWSD would be unable to help mitigate the actual and projected reductions in water supply reliability through the use of its spreading ponds' unused capacity for groundwater recharge. Some permanent crop acreage may return to annual crops, where it can be fallowed in water-short years (unlike permanent crops). Accordingly, socieconomic resources could be expected to be slightly impacted. Fallowing results in losses in crop revenues, farm income, and farm employment, along with additional losses in related manufacturing, trade, and service industries.

Proposed Action
Over the long term, the Proposed Action would facilitate an increase in the reliability of the region's water supply. This would subsequently help to maintain the economic viability of irrigated agriculture within the region, which presently includes a significant percentage of permanent crops. There is greater economic output associated with permanent crops, which

includes a year-round demand for farm labor (as compared to annual crops). In the short term, the Proposed Action would provide a temporary increase in construction-related jobs. As a result, there will be slight beneficial impacts to socioeconomic resources.

Cumulative Impacts

The Proposed Action would result in an increase in the region's water supply reliability, which would help sustain an economy of irrigated agriculture. When added to other similar existing and proposed actions, the Proposed Action would contribute to beneficial cumulative impacts to socioeconomic resources.

3.7 Environmental Justice

Environmental justice refers to the fair treatment of peoples of all races, income levels, and cultures with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment implies that no person or group of people should shoulder a disproportionate share of negative impacts resulting from the execution of Federal programs. Executive Order 12898, dated February 11, 1994, establishes the achievement of environmental justice as a Federal agency priority. The memorandum accompanying the order directs heads of departments and agencies to analyze the environmental effects of federal actions, including human health, economic, and social effects when required by National Environmental Policy Act, and to address significant and adverse effects on minority and low-income communities.

3.7.1 Affected Environment

The project area would take place in a rural, agricultural setting, with no residences in the immediate vicinity. The closest residences are located about three-quarters of a mile to the south of the 8-1 Lateral and there is nothing to suggest that those specific residences are associated with minority, low-income, or other disadvantaged populations.

Owing to a relatively recent (and large) annexation by the City of Shafter, the area of the 8-1 Lateral is located within the City of Shafter; however, the closest residences associated with the City of Shafter are located about seven miles to the northwest. Two other communities, the cities of McFarland and Wasco, are located to the north and west (respectively) of the spreading areas served by the Lerdo Canal. All three of these communities are considered economically disadvantaged, with median household incomes less than 80 percent of the median for the State. These communities rely to a large extent, either directly or indirectly, on agriculture for employment. Most of these communities have residents of Hispanic or Latino origin.

3.7.2 Environmental Consequences

No Action Alternative

The No Action Alternative may result in a slight adverse impact to minority or low-income populations near the project location. Without the ability to improve the region's water supply reliability, there could be a decrease in farm-related jobs which these communities rely so heavily upon.

Proposed Action

Owing to the distance from the proposed improvements, construction would have no adverse effect on minority or disadvantaged populations. The Proposed Action would improve water supply reliability in NKWSD and the region. Given that the economically-disadvantaged communities of McFarland, Shafter, and Wasco rely exclusively on pumped groundwater for their water supplies and share the same basin, they would benefit from the Proposed Action. In particular, groundwater recharge is required to support groundwater levels. Also, to the extent that water supply reliability is improved in the region, it would serve to support the continued viability of the agricultural economy that has developed in reliance (in whole or in part) upon it, which provides jobs to the residents of these communities. As a result, there would be beneficial impacts to environmental justice from the implementation of the Proposed Action.

Cumulative Impacts

The Proposed Action, when added to other existing and proposed actions, would have a slight beneficial contribution to cumulative impacts associated with environmental justice. The Proposed Action would help support and maintain jobs that low-income and disadvantaged populations rely upon. In addition, some of these communities rely on groundwater as their main source of water supply so the long-term application of groundwater recharge would provide some replenishment to this source.

3.8 Air Quality

3.8.1 Affected Environment

The Proposed Action lies within the San Joaquin Valley Air Basin (SJVAB), the second largest air basin in the State. Air basins share a common "air shed", the boundaries of which are defined by surrounding topography. Although mixing between adjacent air basins inevitably occurs, air quality conditions are relatively uniform within a given air basin. The San Joaquin Valley experiences episodes of poor atmospheric mixing caused by inversion layers formed when temperature increases with elevation above ground, or when a mass of warm, dry air settles over a mass of cooler air near the ground.

Despite years of improvements, the SJVAB does not meet all State and Federal health-based air quality standards. To protect health, the SJVAPCD is required by Federal law to adopt stringent control measures to reduce emissions. On November 30, 1993, the Environmental Protection Agency (EPA) promulgated final general conformity regulations at 40 CFR 93 Subpart B for all federal activities except those covered under transportation conformity. The general conformity regulations apply to a proposed Federal action in a non-attainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutant caused by a proposed action equal or exceed certain emissions thresholds, thus requiring the Federal agency to make a conformity determination. Table 3 presents the emissions thresholds covering the project location's overlying air basin.

Table 3. San Joaquin Valley Attainment Status and Emissions Thresholds for Federal Conformity Determinations			
Pollutant	**Federal Attainment Status[a]**	**(tons/year)[b]**	**(pounds/day)**
Volatile organic compounds (VOC) (as an ozone precursor)	Nonattainment/Serious (8-hour ozone)	50	274
Nitrous oxides (NO_x) (as an ozone precursor)	Attainment/Unclassified	50	274
PM_{10}	Attainment	100	548
Carbon monoxide (CO)	Attainment/Unclassified	100	548

[a]SJVAPCD 2009a
[b]40 CFR 93.153

3.8.2 Environmental Consequences

No Action Alternative
Under the No Action Alternative, there would be no impacts to air quality since no construction would take place.

Proposed Action
Short-term air quality impacts would be associated with construction, and would generally arise from dust generation (fugitive dust) and operation of construction equipment. Fugitive dust results from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. Fugitive dust is a source of airborne particulates, including PM_{10} and $PM_{2.5}$.

Large earth-moving equipment, trucks, and other mobile sources powered by diesel or gasoline are also sources of combustion emissions, including nitrogen dioxide (NO_2), CO, VOC, sulfur dioxide, and small amounts of air toxics. Table 4 below provides a summary of the estimated emissions during construction.

Table 6 - Estimated Project Emissions During Construction and Federal and Local Emissions Thresholds in tons per year				
Pollutant	Federal Attainment Status	Thresholds for Federal Conformity Determinations	Local Significance Thresholds	Estimated Project Emissions[a]
VOC (ozone precursor)	Nonattainment/Serious (8-hour ozone)	50	10	0.5
NO_x (as an ozone precursor)	Attainment/Unclassified	50	10	4.1

PM_{10}	Attainment	100	15	6.3[b]/3.4[c]
CO	Attainment/Unclassified	100	---	3.3

[a]Construction emissions estimated with URBEMIS 2007.
[b]Unmitigated.
[c]Mitigated.

Comparison of the estimated Proposed Action emissions (Table 4) with the thresholds for Federal conformity determinations (Table 3) indicates that project emissions are estimated to be below these thresholds. Notwithstanding this observation, the Proposed Action would comply with the SJVAPCD's Regulation VIII (SJVAPCD 2009) control measures for construction emissions of PM_{10}. One of these control measures includes the use of water with all "land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities" for fugitive dust suppression.

The Proposed Action also involves the operation of electrically-driven pumps and motors; accordingly, there would not be any direct emissions from the operation of project facilities/equipment. The air quality emissions from electrical power have already been considered in environmental documentation for the generating power plant; therefore, a conformity determination is not required. Accordingly, project construction and operations under the Proposed Action would not result adverse impacts to air quality beyond Federal thresholds.

Cumulative Impacts

The Proposed Action, when added to other existing and proposed actions, would not contribute to cumulative impacts to air quality since construction activities are short-term and operations would not result in air quality impacts.

3.9 Global Climate Change

Climate change refers to significant change in measures of climate (e.g., temperature, precipitation, or wind) lasting for decades or longer. Many environmental changes (changes in sun's intensity, changes in ocean circulation, deforestation, urbanization, burning fossil fuels, etc.) can contribute to climate change (EPA 2009).

Gases that trap heat in the atmosphere are often called greenhouse gases (GHG). Some GHG such as carbon dioxide (CO_2) occur naturally and are emitted to the atmosphere through natural processes and human activities. Other GHG (e.g., fluorinated gases) are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are: CO_2, methane (CH_4), NO_x, and fluorinated gasses (EPA 2009). During the past century, humans have substantially added to the amount of GHG in the atmosphere by burning fossil fuels such as coal, natural gas, oil, and gasoline to power our cars, factories, utilities, and appliances. The added gases, primarily CO_2 and CH_4, are enhancing the natural greenhouse effect, and likely contributing to an increase in global average temperature and related climate changes. At present, there are uncertainties associated with the science of

climate change (EPA 2009). More than 20 million Californians rely on regulated delivery of water resources such as the SWP and the CVP, as well as established water rights from rivers. Increases in air temperature may lead to changes in precipitation patterns, runoff timing and volume, sea level rise, and changes in the amount of irrigation water needed due to modified evapotranspiration rates. These changes may lead to impacts to the State's water resources and project operations. While there is general consensus in their trend, the magnitudes and onset-timing of impacts are uncertain and are scenario-dependent (Anderson et al. 2008).

3.9.1 Affected Environment

The State has adopted Assembly Bill 32 (AB 32) and has identified GHG reduction goals; the effect of increased GHG emissions as they relate to global climate change is inherently an adverse environmental impact. While the emissions of one single project will not cause global climate change, GHG emissions from multiple projects throughout the world could result in an impact with respect to global climate change.

3.9.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, there would be no impacts respecting global climate change since no construction would take place and there would not be any long-term electrical energy requirement.

Proposed Action

The Proposed Action would involve short-term impacts consisting of emissions during construction, which have been estimated at about 393 metric tons of CO_2. Long-term impacts are attributable to project operations and would involve the generation of electrical energy to power the electric motor pump drivers. These emissions would vary annually, but have been estimated to average about 159 metric tons/year of CO_2 (PG&E 2009), which is negligible compared to the threshold for annually reporting GHG emissions (25,000 metric tons/year). Accordingly, project construction and operations under the Proposed Action would result in *de minimis* impacts to global climate change.

Cumulative Impacts

Greenhouse gas impacts are considered to be cumulative impacts. The Proposed Action, when added to other existing and proposed actions, would not contribute to cumulative impacts to global climate change owing to the *de minimis* magnitude of annual GHG emissions.

Section 4 Consultation and Coordination

Several Federal laws, permits, licenses and policy requirements have directed, limited or guided the National Environmental Policy Act analysis and decision making process of this EA.

4.1 Fish and Wildlife Coordination Act (16 USC § 651 et seq.)

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (Federal and State) on all water development projects that could affect biological resources. The amendments enacted in 1946 require consultation with the FWS and State fish and wildlife agencies where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted or otherwise controlled or modified" by any agency under a Federal permit or license. Consultation is to be undertaken for the purpose of "preventing the loss of and damage to wildlife resources."

The Proposed Action consists of modifying existing facilities which would ultimately convey water to existing spreading ponds for groundwater recharge. The Proposed Action would not impound, divert, control or modify a body of water; therefore, the FWCA would not apply.

4.2 Endangered Species Act (16 USC § 1531 et seq.)

Section 7 of the Endangered Species Act requires Federal agencies to ensure that discretionary federal actions do not jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of the critical habitat of these species.

Reclamation has determined that the Proposed Action would have No Effect to species listed and critical habitats designated under the ESA, and no consultation with the FWS is required. This determination is based on the information presented previously in Section 3.3.2 and is largely reliant on the absence of listed species from areas that would be affected by the Proposed Action. Pre-construction biological surveys would be conducted before any ground-disturbing activities are to begin. If the surveys find that no special-status species are present within the project area, Reclamation's determination would remain. If the surveys detect the presence of listed species, then the Proposed Action would be paused while Reclamation revisits the ESA determination and completes any consultation that might be necessary with the FWS.

4.3 National Historic Preservation Act (16 USC § 470 et seq.)

The NHPA of 1966, as amended, is the primary Federal legislation that outlines the Federal Government's responsibility to consider the effects of their actions on historic properties. The 36 CFR Part 800 regulations that implement Section 106 of the NHPA describe how Federal agencies address these effects. Additionally, Native American human remains, cultural objects, and objects of cultural patrimony are protected under the Native American Graves Protection and Repatriation Act of 1990 (25 USC 32) and its implementing regulation outlined at 43 CFR Part 10. The Archaeological Resources Protection Act of 1979 (16 USC 470aa), as amended, and its implementing regulations at 43 CFR 7, protects archaeological resources on Federal land.

Pending SHPO concurrence, the Proposed Action is anticipated to not have any impacts on historic properties based on conclusions in Section 3.4.2.

4.4 Indian Trust Assets

ITA are legal interests in property held in trust by the U.S. for Federally-recognized Indian tribes or individual Indians. An Indian trust has three components: (1) the trustee, (2) the beneficiary, and (3) the trust asset. ITA can include land, minerals, federally-reserved hunting and fishing rights, federally-reserved water rights, and in-stream flows associated with trust land. Beneficiaries of the Indian trust relationship are federally-recognized Indian tribes with trust land; the U.S. is the trustee. By definition, ITA cannot be sold, leased, or otherwise encumbered without approval of the U.S. The characterization and application of the U.S. trust relationship have been defined by case law that interprets Congressional acts, executive orders, and historic treaty provisions.

The Proposed action would not affect ITA. The nearest ITA is the Tule River Reservation approximately 40 miles northeast of the project location.

4.5 Migratory Bird Treaty Act (16 USC § 703 et seq.)

The MBTA implements various treaties and conventions between the U.S., Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless permitted by regulations, the MBTA provides that it is unlawful to pursue, hunt, take, capture or kill, possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Subject to limitations in the MBTA, the Secretary of the Interior may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting or exporting of any migratory bird, part, nest or egg will be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits and migratory flight patterns.

The Proposed Action would not change the land use patterns of the cultivated or fallowed fields that do have some value to listed species or birds protected by the MBTA. Pending the results of the pre-construction survey for burrowing owl, it is anticipated that the Proposed Action would have no effect on birds protected by the MBTA.

4.6 Executive Order 11988 – Floodplain Management and Executive Order 11990 – Protection of Wetlands

Executive Order 11988 requires Federal agencies to prepare floodplain assessments for actions located within or affecting flood plains, and similarly, Executive Order 11990 places similar requirements for actions in wetlands.

The Proposed Action would construct facilities that would ultimately deliver water to existing spreading ponds for groundwater recharge and would not impact wetlands and/or floodplains.

4.7 Clean Air Act (42 USC § 176 et seq.)

Section 176 (c) of the Clean Air Act (CAA) (42 USC 7506 (c)) requires that any entity of the Federal government that engages in, supports, or in any way provided financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan (SIP) required under Section 110 (a) of the CAA (42 USC 7401 (a)) before the action is otherwise approved. In this context, conformity means that such federal actions must be consistent with a SIP's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards and achieving expeditious attainment of those standards. Each federal agency must determine that any action that is proposed by the agency and that is subject to the regulations implementing the conformity requirements will, in fact conform to the applicable SIP before the action is taken.

As described in Section 3.8.2, the Proposed Action would not result in air quality impacts that would exceed State, Federal, and local thresholds.

4.8 Clean Water Act (16 USC § 703 et seq.)

Section 401

Section 401 of the Clean Water Act (CWA) (33 USC § 1311) prohibits the discharge of any pollutants into navigable waters, except as allowed by permit issued under sections 402 and 404 of the CWA (33 USC § 1342 and 1344). If new structures (e.g., treatment plants) are proposed, that would discharge effluent into navigable waters, relevant permits under the CWA would be required for the project applicant(s). Section 401 requires any applicant for an individual U.S. Army Corps of Engineers (Corps) dredge and fill discharge permit to first obtain certification from the state that the activity associated with dredging or filling will comply with applicable state effluent and water quality standards. This certification must be approved or waived prior to the issuance of a permit for dredging and filling.

No pollutants would be discharged into any navigable waters under the Proposed Action so no permits under Section 401 of the CWA are required.

Section 404

Section 404 of the CWA authorizes the Corps to issue permits to regulate the discharge of "dredged or fill materials into waters of the United States" (33 USC § 1344).

No activities such as dredging or filling of wetlands or surface waters would be required for implementation of the Proposed Action, therefore permits obtained in compliance with CWA section 404 are not required.

Section 5 List of Preparers and Reviewers

U.S. Bureau of Reclamation

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Jennifer Lewis, Wildlife Biologist, SCCAO
Patricia Rivera, Indian Trust Assets, MP- 400
Adam Nickels, Cultural Resources, MP-153
Mike Kinsey, Supervisory Natural Resources Specialist, SCCAO – Reviewer
Patti Clinton, Natural Resources Specialist, SCCAO – Reviewer
Rain Healer, Natural Resources Specialist, SCCAO - Reviewer

GEI Consultants, Inc.

Terry Nguyen, Assistant Engineer
Erin Ringer, Assistant Engineer
Ronald J. Eid, Principal Engineer

Subcontractors

Catherine L. Pruett, Three Girls and a Shovel, LLC
Rand F. Herbert, JRP Historical Consulting, LLC
William J. Vanherweg, Certified Wildlife Biologist

Section 6 References

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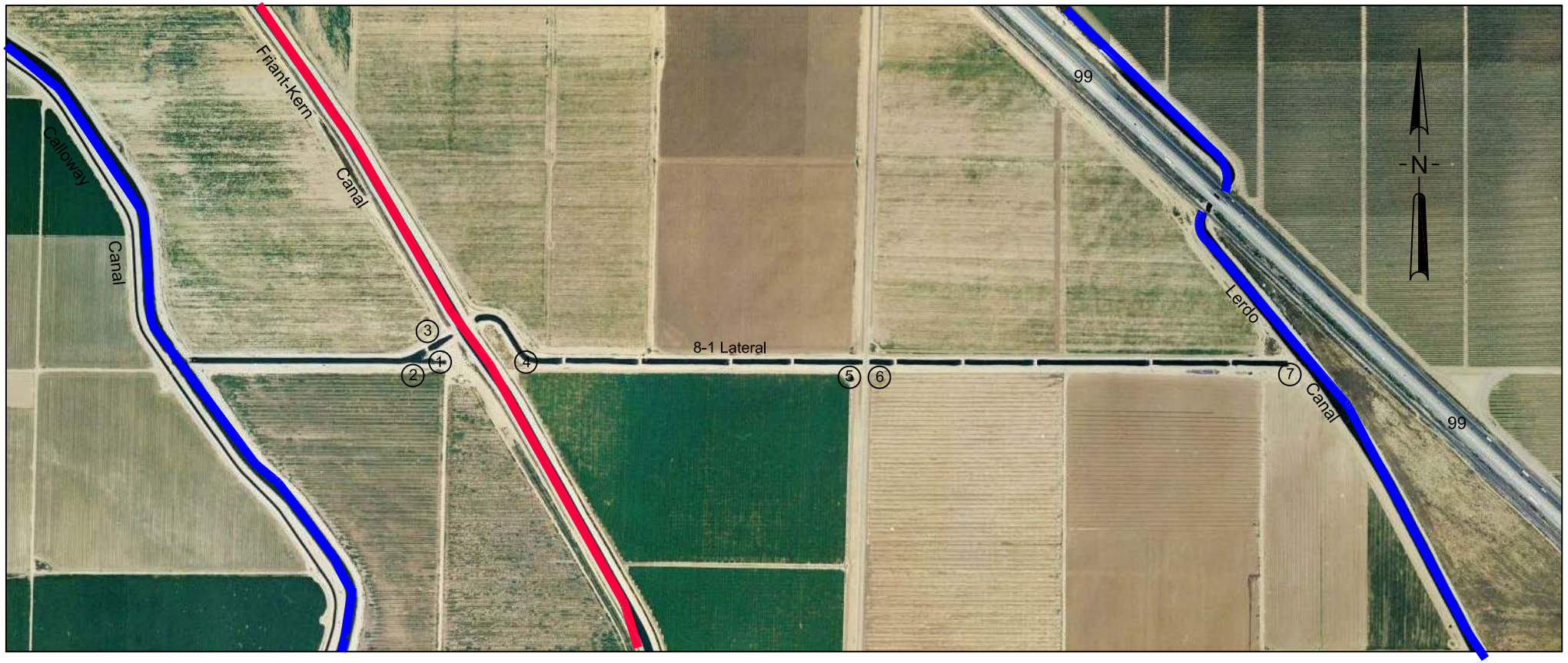
Appendix A

Site Photographs


Calloway
Canal
Friant-Kern
Canal
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8-1 Lateral
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7

Photo 1 - Looking easterly toward the existing NK turnout from the Friant-Kern Canal

Photo 2 - Looking westerly along the 8-1 Lateral Canal from the discharge conduit from the F-K turnout

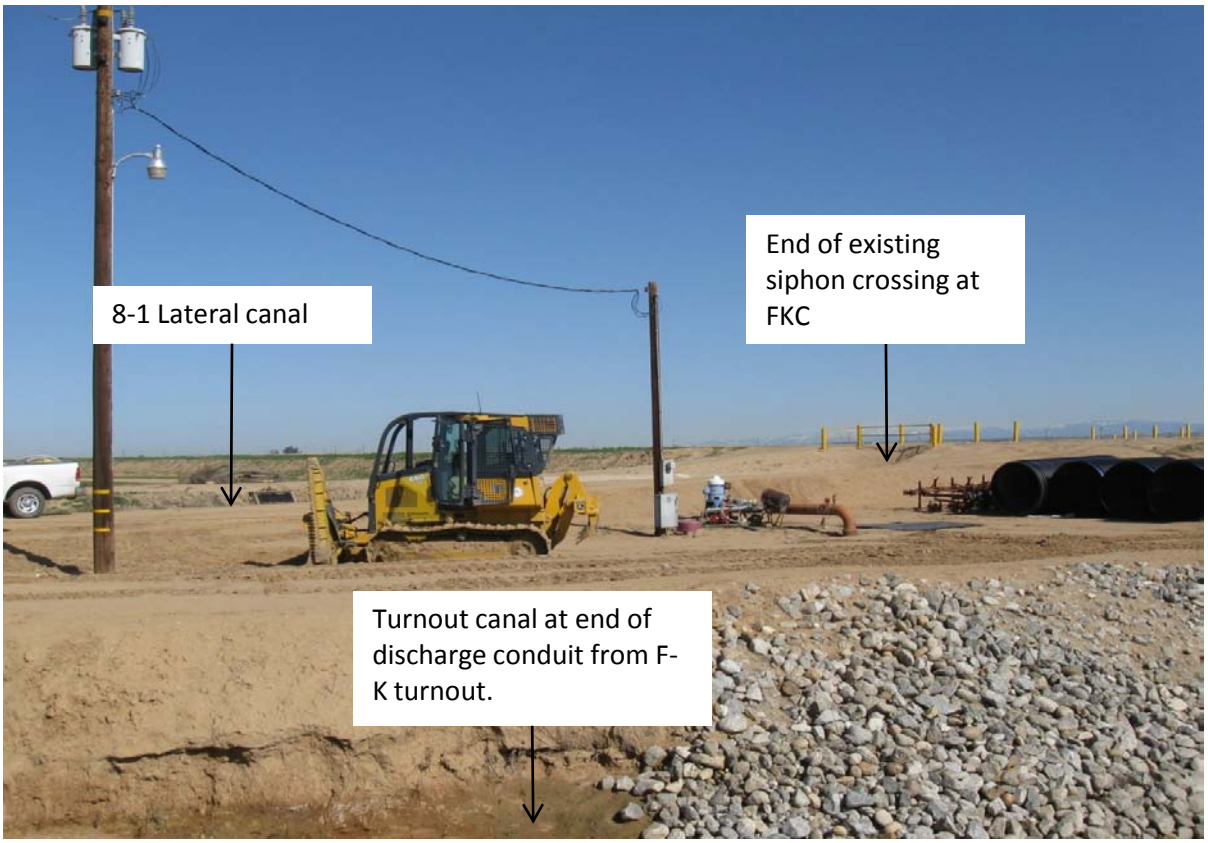


Photo 3 -Looking north toward the 8-1 Lateral where the proposed pumping plant will be constructed.

Photo 4 - Looking northwesterly at the 8-1 Lateral Canal

Photo 5 - Looking west along the south side of the 8-1 Lateral Canal

Photo 6 - Looking west along the south side of the 8-1 Lateral Canal

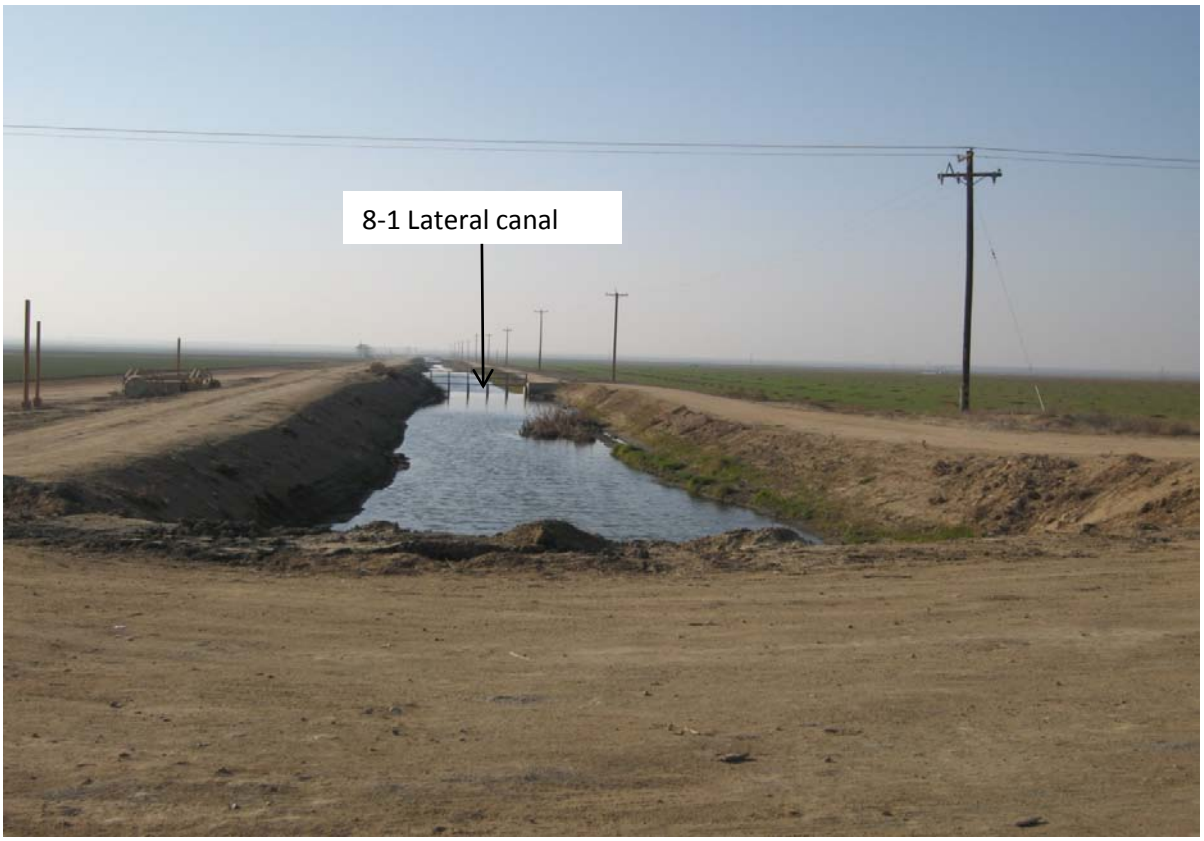


Photo 7a - Looking west on the 8-1 Lateral Canal from the location of the proposed inlet/outlet structure at the Lerdo Canal

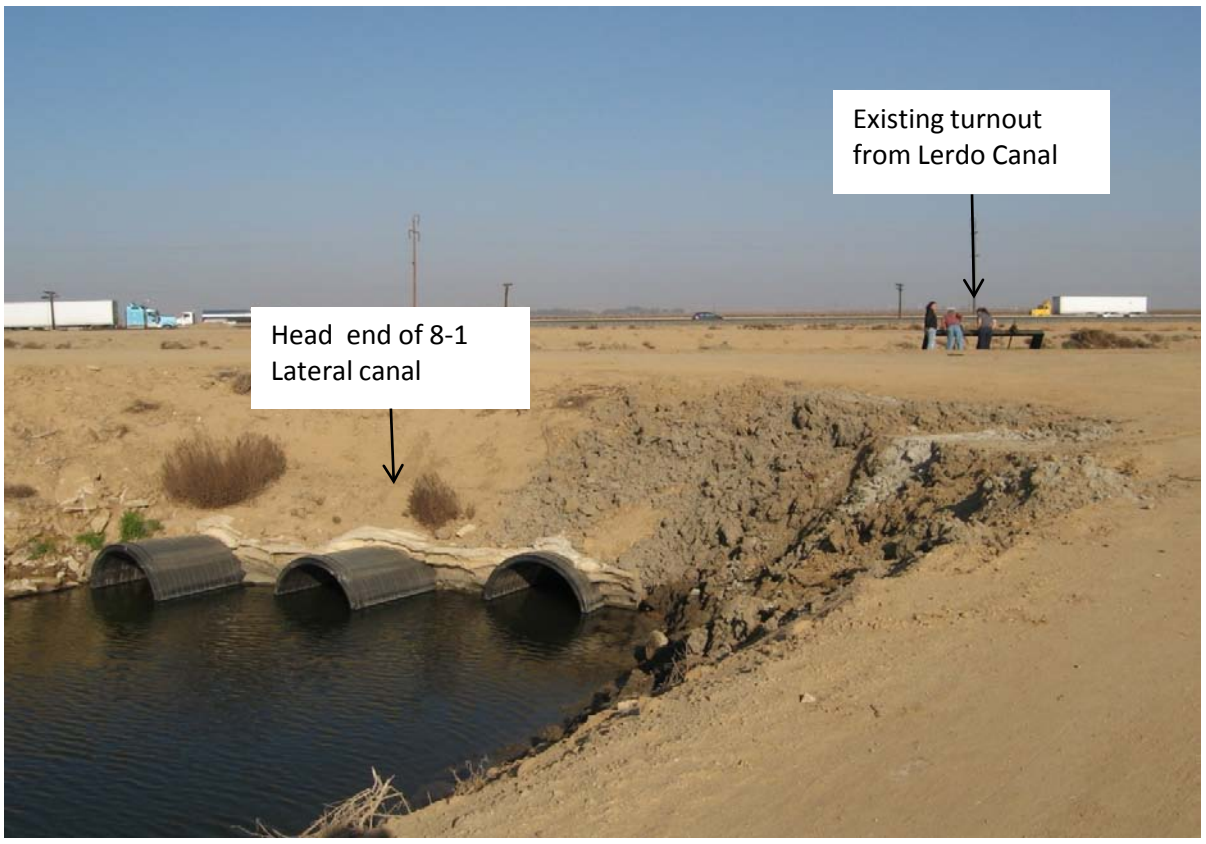
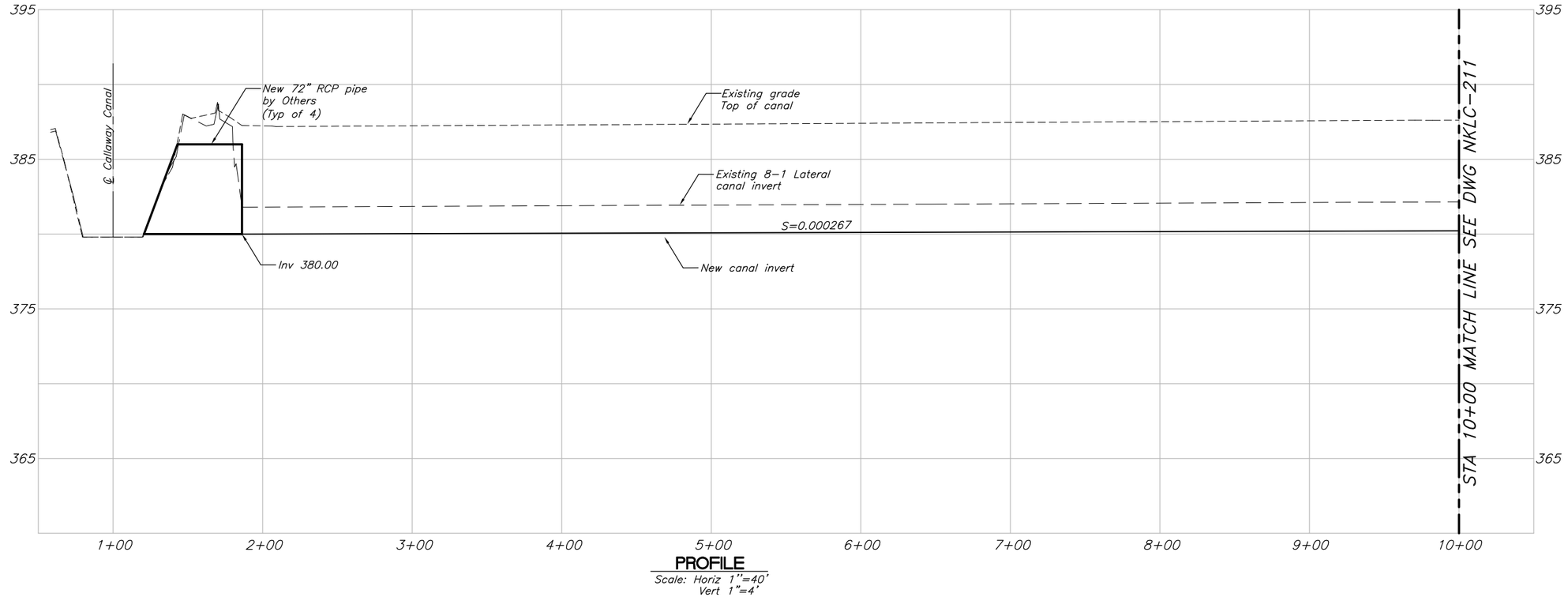


Photo 7b - Looking northeasterly toward the Lerdo Canal (at east end of proposed Project)

Appendix B

Plan and Profile Drawings

(Note: all references to 108-inch RCP
will be changed to 96-inch RCP)



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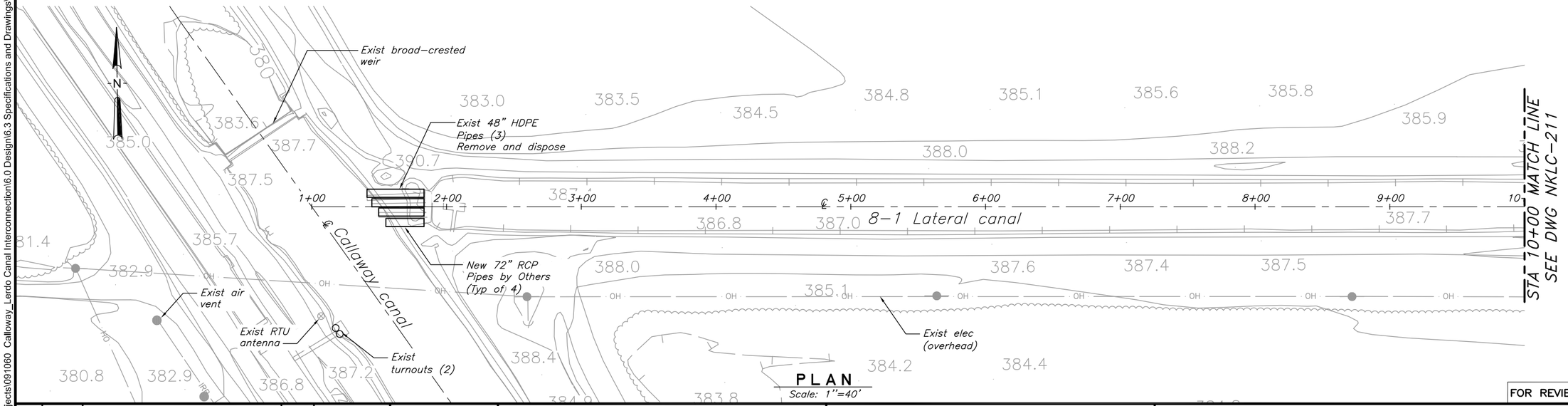

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FOR REVIEW PURPOSES ONLY

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ENGINEER SEAL:

GEI Consultants
Bookman-Edmonston Division

DESIGNED: HARGROVE/NGO
CHECKED: ROZMAN/HUANG
DRAWN: HARGROVE/NGO
SUBMITTED BY:
MARC ROZMAN
PROJECT MANAGER
R. C. E. NO.
DATE

NORTH KERN WSD
Bakersfield, CA

NORTH KERN WATER STORAGE DISTRICT
CALLOWAY CANAL AND LERDO CANAL INTERCONNECTION

PLAN AND PROFILE
8–1 LATERAL CANAL IMPROVEMENTS
STA 1+00 TO STA 10+00

PROJECT NO: 091060
DATE: September 2009
DRAWING NO: NKLC–217

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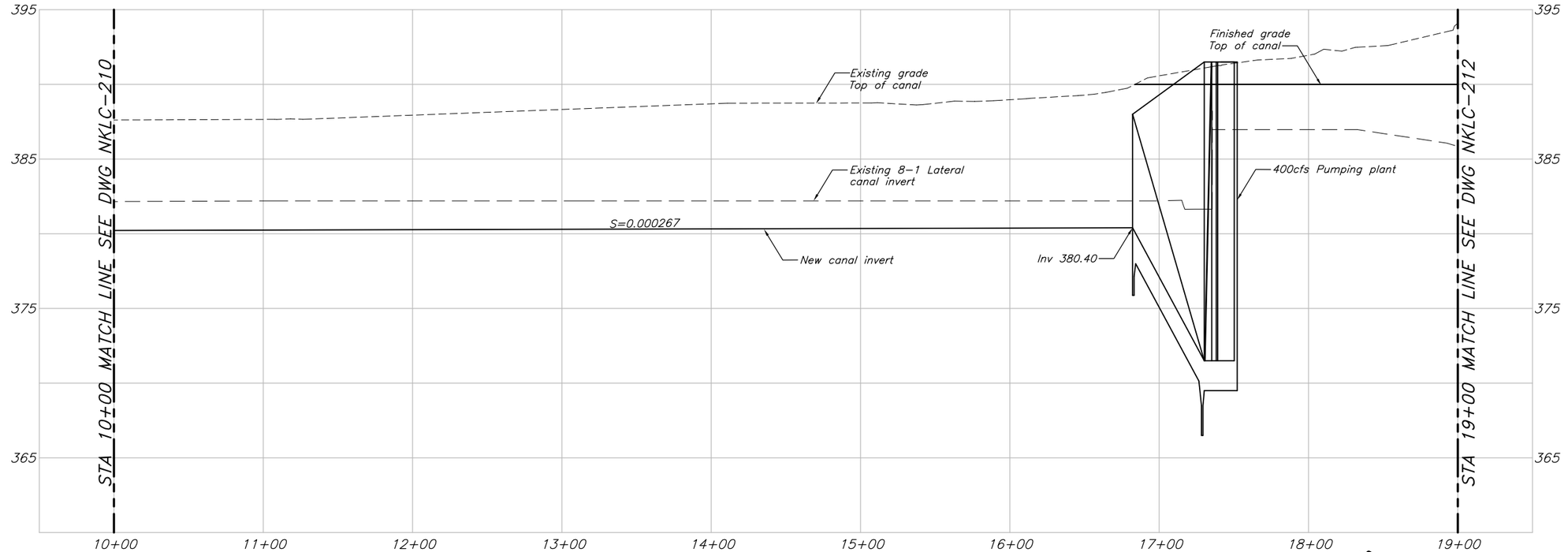

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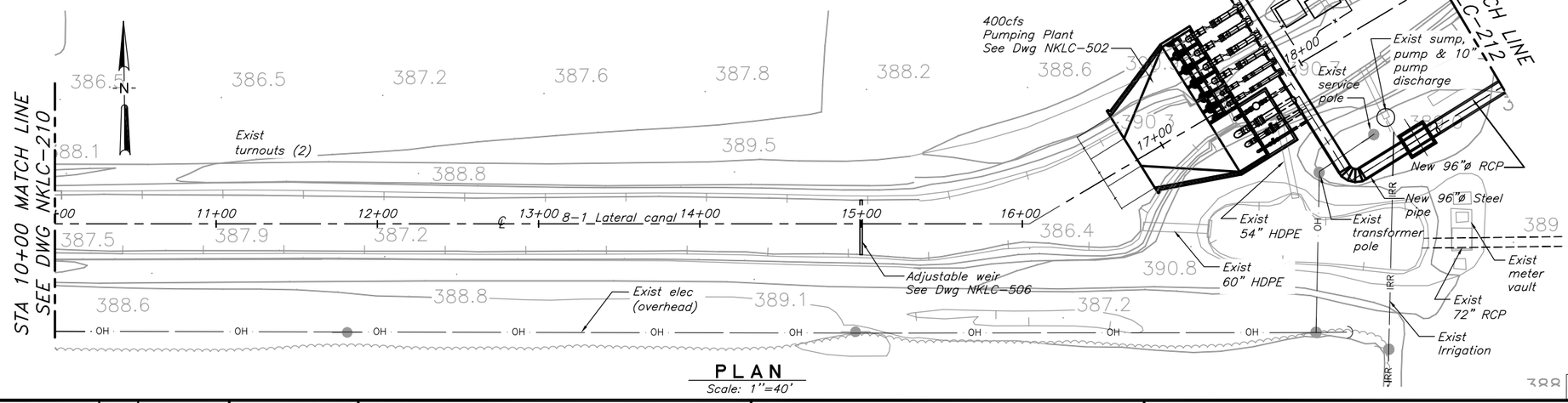

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PLAN AND PROFILE
8-1 LATERAL CANAL IMPROVEMENTS
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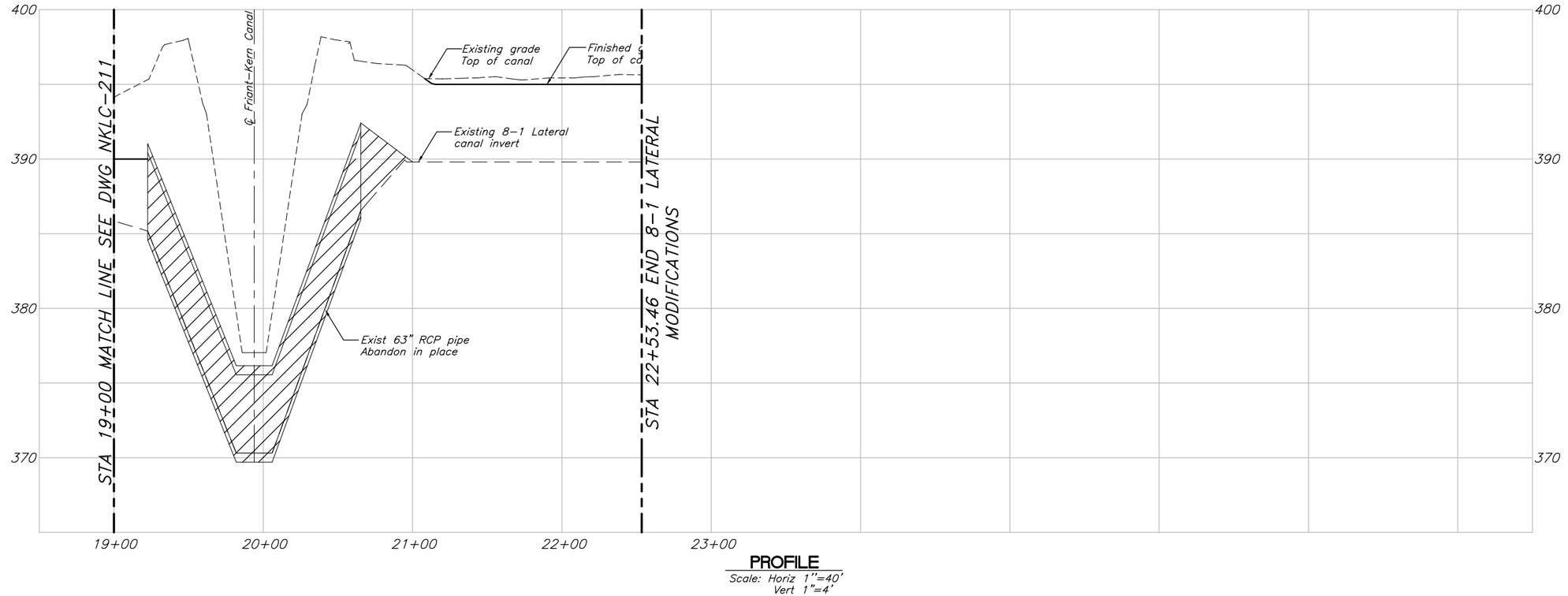

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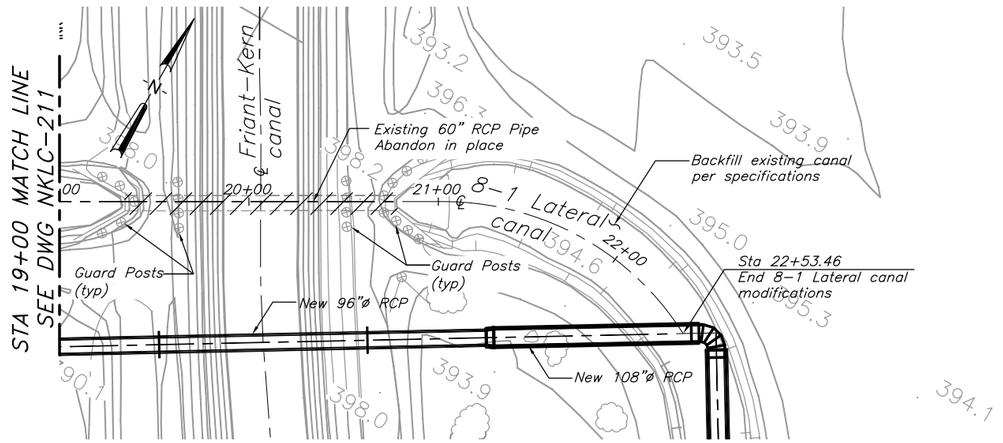

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CALLOWAY CANAL AND LERDO CANAL INTERCONNECTION

PLAN AND PROFILE
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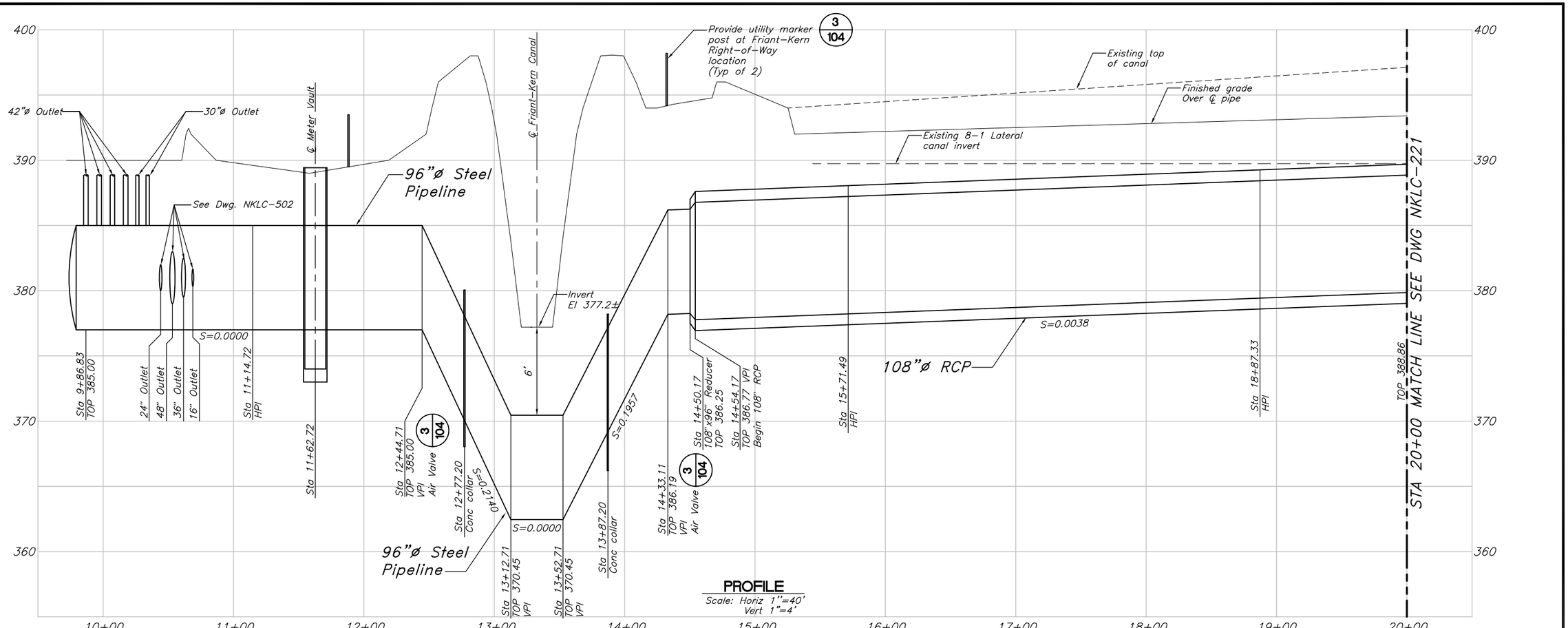

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NORTH KERN WATER STORAGE DISTRICT
CALLOWAY CANAL AND LERDO CANAL INTERCONNECTION

PLAN AND PROFILE
96" AND 108" TRANSMISSION PIPELINE
STA 9+95 TO STA 20+00

PROJECT NO: 091060
DATE: September 2009
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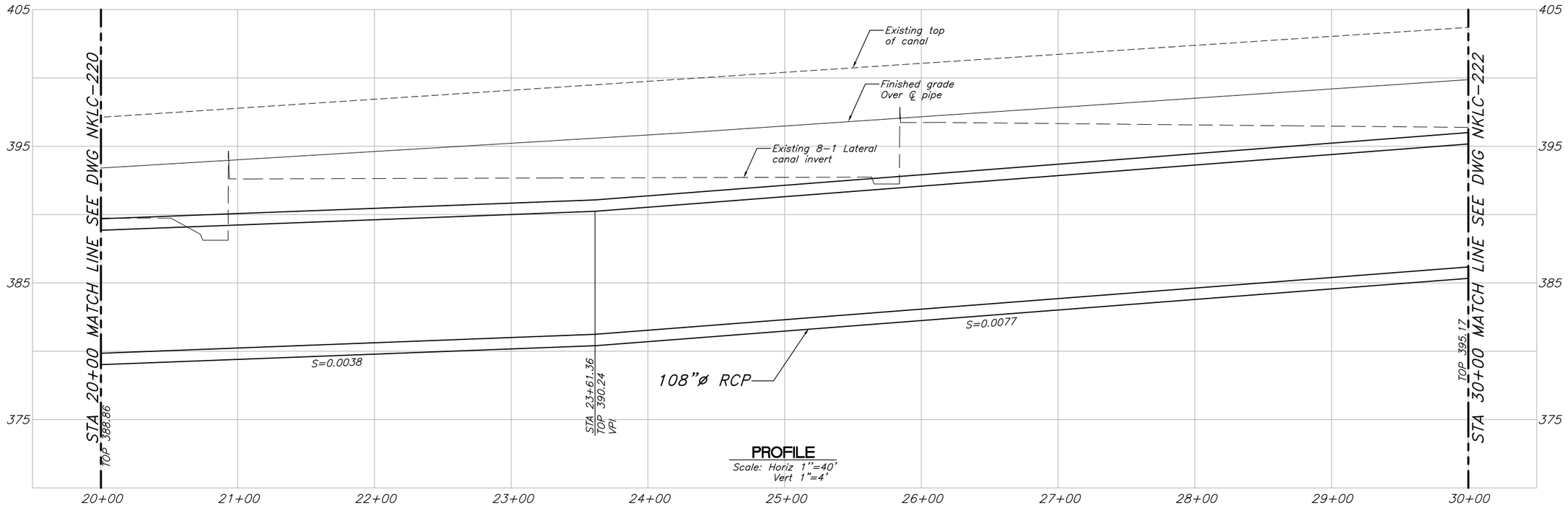

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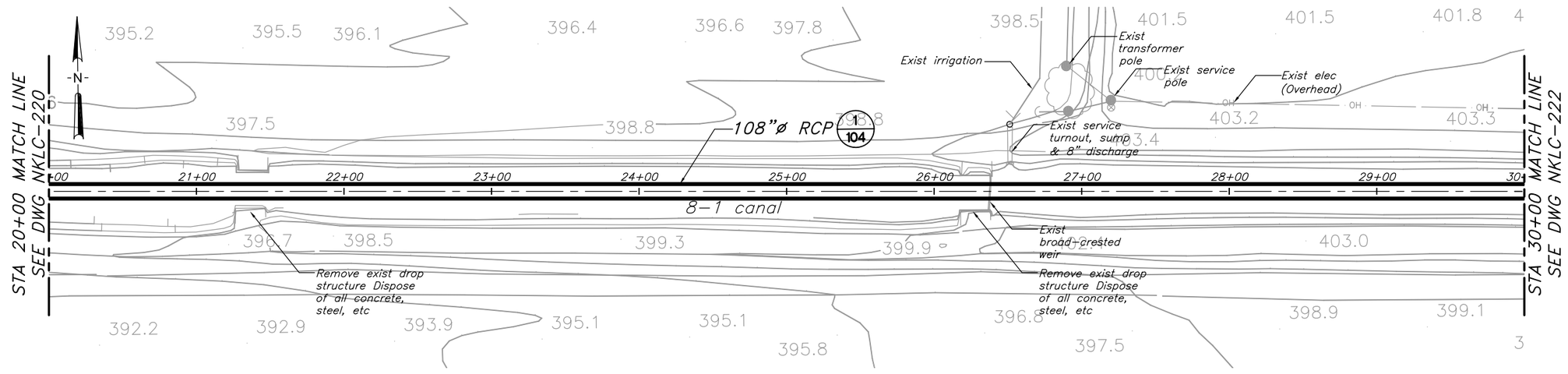

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NORTH KERN WATER STORAGE DISTRICT
CALLOWAY CANAL AND LERDO CANAL INTERCONNECTION

PLAN AND PROFILE
96" AND 108" TRANSMISSION PIPELINE
STA 20+00 TO STA 30+00

PROJECT NO: 091060
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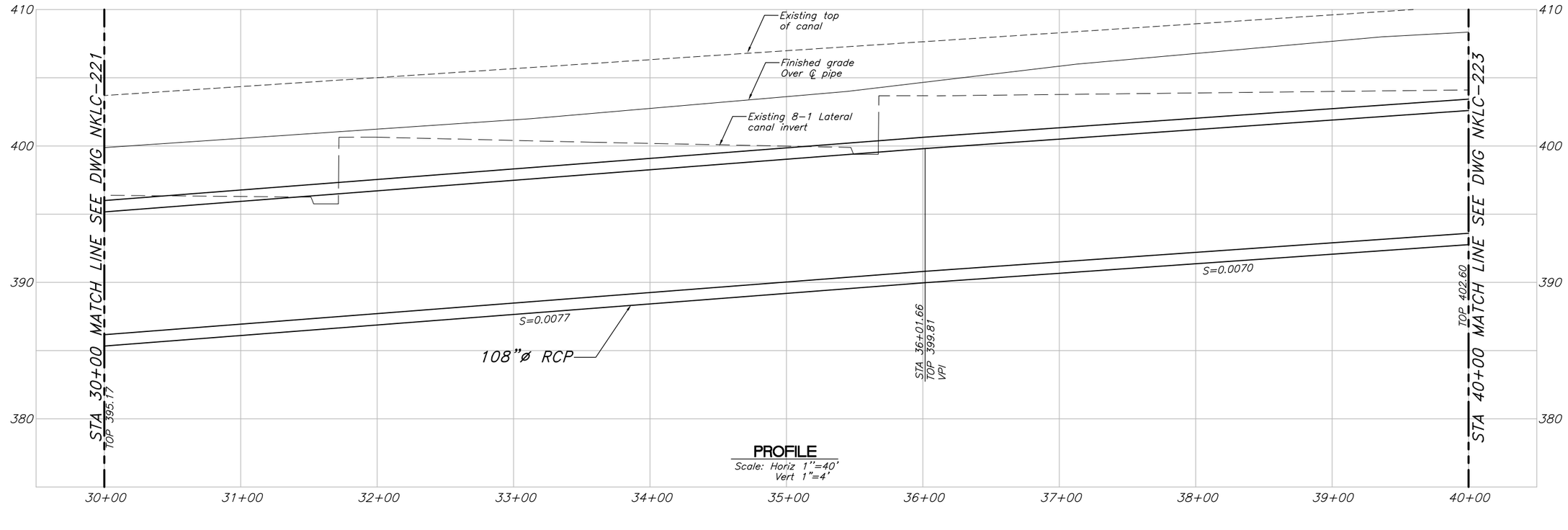

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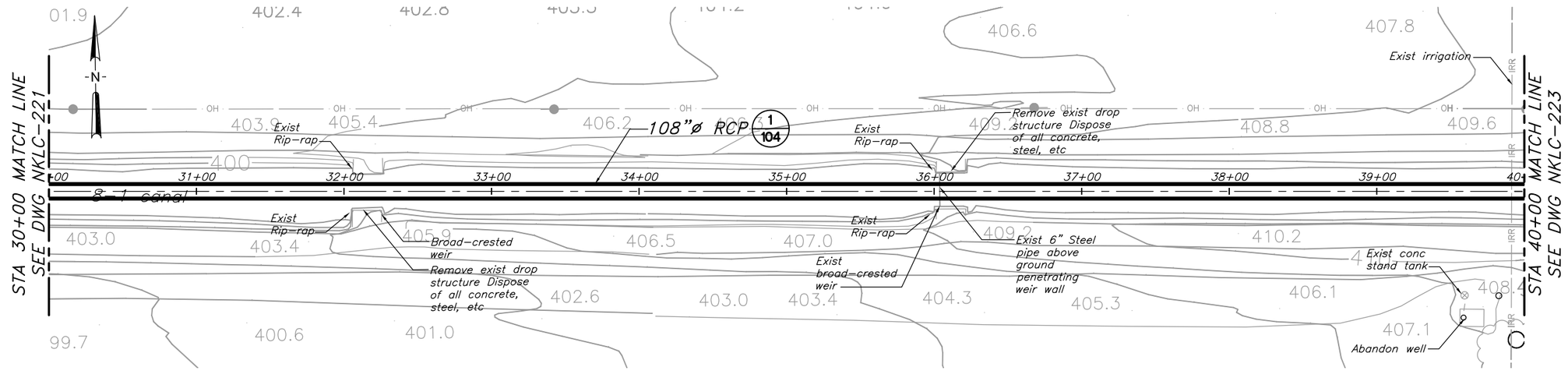

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NORTH KERN WSD
Bakersfield, CA

NORTH KERN WATER STORAGE DISTRICT
CALLOWAY CANAL AND LERDO CANAL INTERCONNECTION

PLAN AND PROFILE
96" AND 108" TRANSMISSION PIPELINE
STA 30+00 TO STA 40+00

PROJECT NO: 091060
DATE: September 2009
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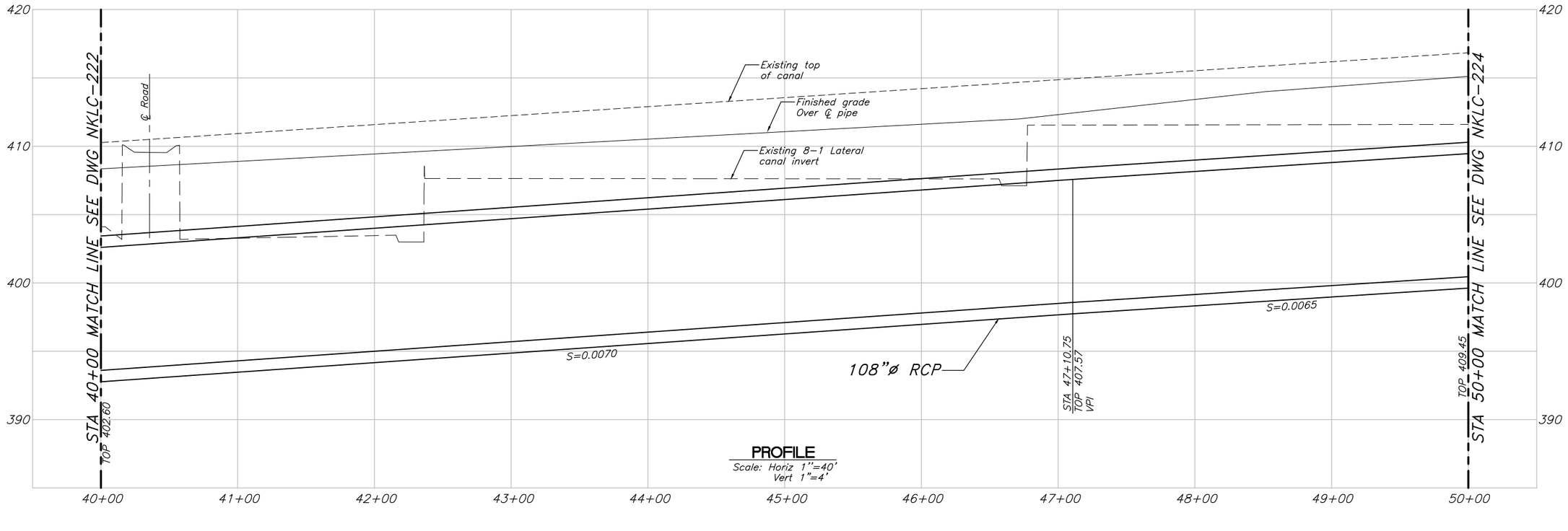

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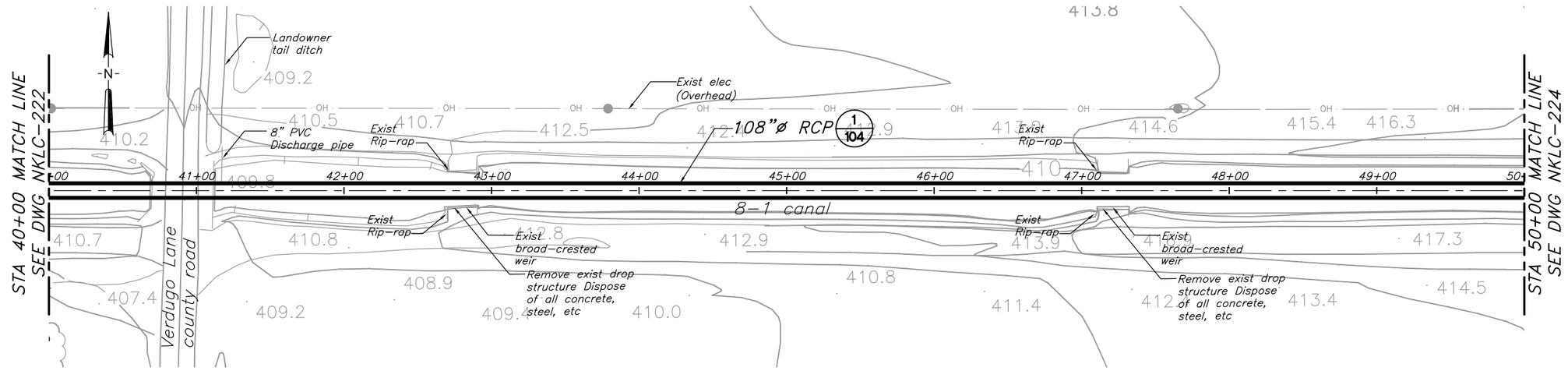

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DATE

NORTH KERN WSD
Bakersfield, CA

NORTH KERN WATER STORAGE DISTRICT
CALLOWAY CANAL AND LERDO CANAL INTERCONNECTION

PLAN AND PROFILE
96" AND 108" TRANSMISSION PIPELINE
STA 40+00 TO STA 50+00

PROJECT NO: 091060
DATE: September 2009
DRAWING NO: NKLC-223

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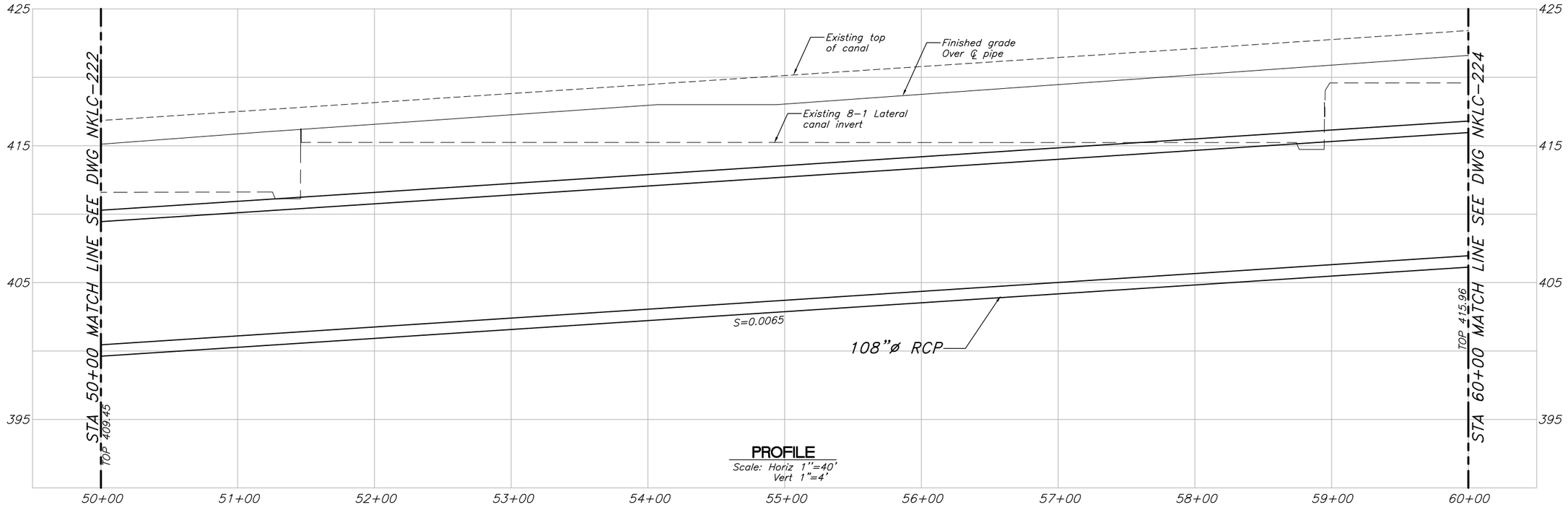

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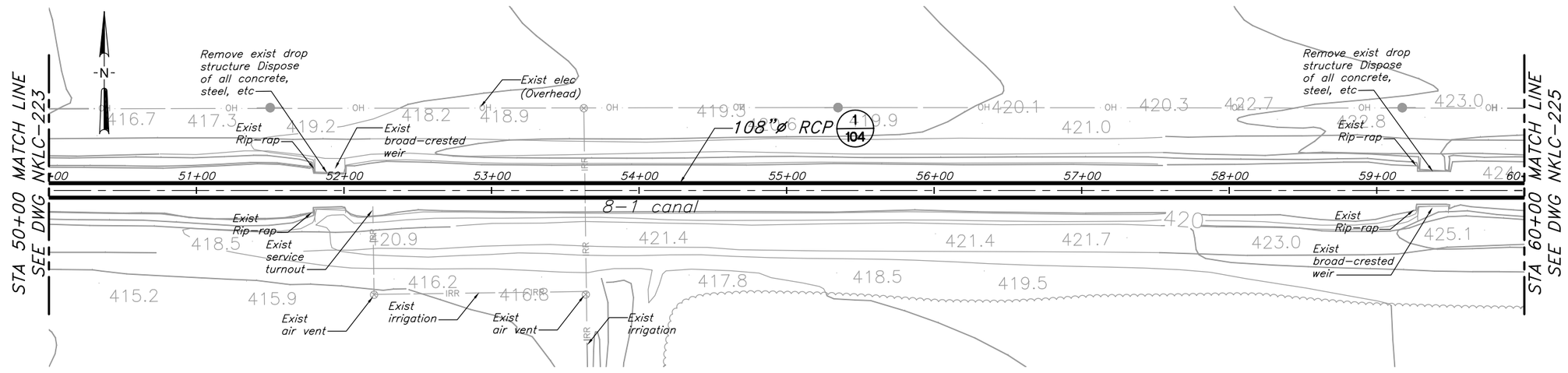

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REV	DATE	DESCRIPTION	APP'D

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

ENGINEER SEAL:

GEI Consultants
Bookman-Edmonston Division

DESIGNED: HARGROVE/NGO
CHECKED: ROZMAN/HUANG
DRAWN: HARGROVE/NGO
SUBMITTED BY:
MARC ROZMAN
PROJECT MANAGER
R. C. E. NO.
DATE

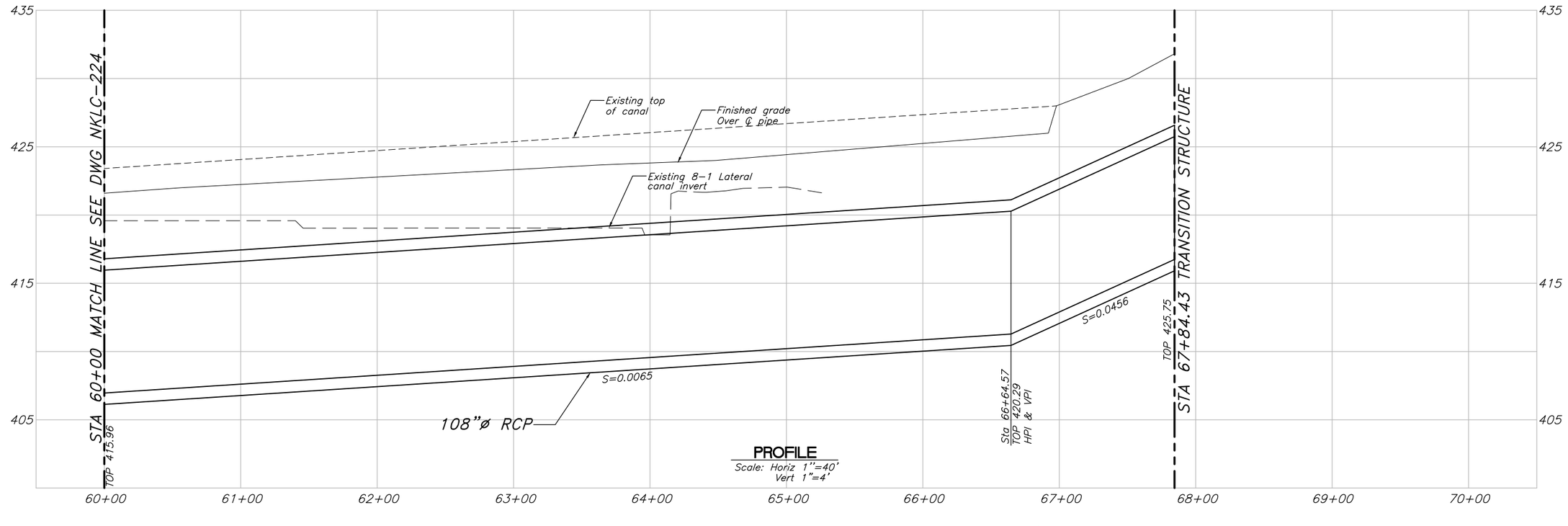
NORTH KERN WSD
Bakersfield, CA

NORTH KERN WATER STORAGE DISTRICT
CALLOWAY CANAL AND LERDO CANAL INTERCONNECTION

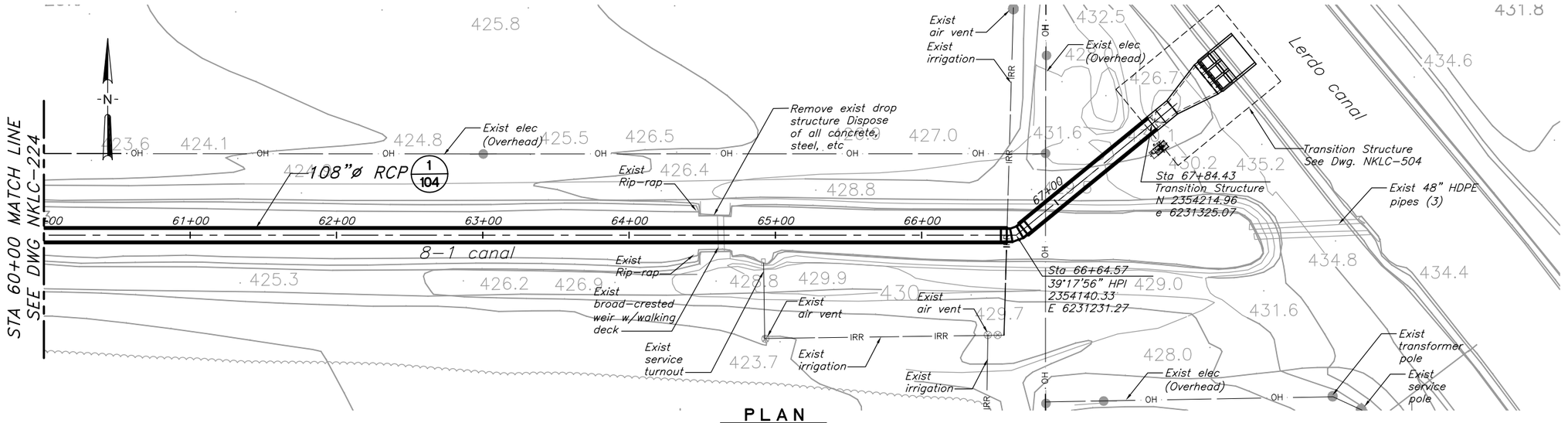
PLAN AND PROFILE
96" AND 108" TRANSMISSION PIPELINE
STA 50+00 TO STA 60+00

PROJECT NO: 091060
DATE: September 2009
DRAWING NO: NKLC-224

J:\North Kern WSD\Projects\091060 Calloway_Lerdo Canal Interconnection\6.0 Design\6.3 Specifications and Drawings\Drawings\Working\NKLC-224.dwg Layout1 Sep 30, 2009 01:54:09 pm



PROFILE
Scale: Horiz 1"=40'
Vert 1"=4'



PLAN
Scale: 1"=40'

FOR REVIEW PURPOSES ONLY

REV	DATE	DESCRIPTION	APP'D

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

ENGINEER SEAL:

GEI Consultants
Bookman-Edmonston Division

DESIGNED: HARGROVE/NGO
CHECKED: ROZMAN/HUANG
DRAWN: HARGROVE/NGO
SUBMITTED BY:
MARC ROZMAN
PROJECT MANAGER
R. C. E. NO.
DATE

NORTH KERN WSD
Bakersfield, CA

NORTH KERN WATER STORAGE DISTRICT
CALLOWAY CANAL AND LERDO CANAL INTERCONNECTION

PLAN AND PROFILE
96" AND 108" TRANSMISSION PIPELINE
STA 50+00 TO STA 67+84.43

PROJECT NO: 091060
DATE: September 2009
DRAWING NO: NKLC-225

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