

Appendix A

MID's Environmental Commitments

Appendix A

Environmental Commitments

The following environmental commitments would be implemented where applicable.

A.1 Agricultural

A.1.1 Environmental Commitment AG-1: Permanently Preserve Farmland by Establishing a Conservation Easement on Agricultural Land

MID will establish conservation easements on agricultural land at an effect-to-mitigation ratio of 2:1 to prevent permanent conversion of the land to urban uses and to increase farm viability. This mitigation will be in kind and used to mitigate the loss of farmland classified as prime farmland or farmland of statewide importance.

A.2 Air Quality

A.2.1 Environmental Commitment AQ-1: Implement San Joaquin Valley Air Pollution Control District Regulation VIII Control Measures

The following Regulation VIII control measures for construction emissions of PM₁₀ are required by the San Joaquin Valley Air Pollution Control District (SJVAPCD).

- All disturbed areas, including storage piles, that are not being actively used for construction purposes will be effectively stabilized against dust emissions using water, chemical stabilizer/suppressant, or vegetative ground cover. Chemical stabilizer/suppressants will not be used near waters of the United States.
- All on-site unpaved roads and off-site unpaved access roads used during construction will be effectively stabilized against dust emissions using water or chemical stabilizer/suppressant.
- All land-clearing, grubbing, scraping, excavating, land-leveling, grading, cut-and-fill, and demolition activities will be effectively controlled against fugitive dust emissions by applying water or presoaking.
- All operations will limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours during operations (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit visible dust emissions. The use of blower devices is expressly forbidden.). After materials are added to or removed from the surface of outdoor storage piles, the piles will be effectively

stabilized against fugitive dust emissions using sufficient water or chemical stabilizer/suppressant.

A.2.2 Environmental Commitment AQ-2: Reduce Emissions Associated with Idling Equipment

Per California Air Resources Board regulations (Title 13 of the California Code of Regulations, Sections 2480 and 2485), which limit idling of diesel-fueled commercial motor vehicles, MID will require that all diesel engines be shut off when not in use to reduce emissions from idling.

A.2.3 Environmental Commitment AQ-3: Use Electric Pumps

MID will use as many electric pumps as possible for recovery operations to reduce emissions associated with propane. If propane pumps are needed, MID will use engines with catalytic controls and that meet SJVAPCD best available control technology (BACT) requirement for engines over 50 hp.

A.3 Biological Resources

A.3.1 Environmental Commitment BIO-1: Establish a Grasslands Conservation Easement

Mitigation for the loss of California annual grassland, alkali grassland, or Great Valley iodine brush scrub would consist of establishing a grasslands conservation easement at Madera Ranch over an area of habitat larger than the area subject to long-term degradation (2 acres conserved: 1 acre affected for swales) or permanent loss (3 acre conserved: 1 acre lost). MID also would implement a management plan to improve existing on-site habitat through grazing management and species monitoring. This measure would compensate completely for the loss of these habitats.

A.3.2 Environmental Commitment BIO-2a: Preconstruction Surveys/Avoid Effects on Vernal Pools and Alkali Rain Pools

MID will minimize effects on species in this habitat by avoiding these wetlands to the extent practical. A buffer area will be established around suitable habitat for listed crustaceans in the action area, i.e., vernal pools. Buffer areas will be demarcated by installing fencing 250 feet from each occupied pool. A qualified biologist will flag the pools to be fenced, and temporary fences will be installed as the first order of work. Construction barrier fencing will be placed at the edge of the buffer areas. Temporary fences will be furnished, constructed, maintained, and later removed as shown on the construction plans, as specified in the special provisions, and as directed by the project engineer. Temporary fencing will be four feet high, orange, commercial-quality woven polypropylene. No construction activities will be permitted within the buffer zone (including staging or sidelaying of material) other than those activities necessary to erect the fencing. Erosion control measures will be employed adjacent to occupied listed crustacean habitat to prevent soil

from eroding or falling into these areas. Natural/ biodegradable erosion control measures (e.g., straw wattles, hay bales) will be used. Plastic monofilament netting (erosion control matting) will not be allowed.

A.3.3 Environmental Commitment BIO-2b: Create, Restore, and/or Preserve Vernal Pools

MID will create, restore and/or preserve vernal pool habitat at Madera Ranch in an area protected under a conservation easement. Five acres of vernal habitat would be restored and/or preserved for each acre of vernal pool or alkali rain pool habitat lost as a result of activities associated with the Proposed Action (45 acre created: 1 acre lost). MID anticipates that the approximate split of these acreages will be 3:1 preservation and 2:1 creation/restoration. This ultimately will be determined based on wetland locations, soil conditions, and consultation with the Corps; soils, hydrology, vegetation, and species will be monitored. The performance standard for created vernal pools is to ensure the new vernal pools emulate the natural pools at Madera Ranch. Created vernal pools would have similar plant species composition and vegetation cover and invertebrate fauna as the vernal pools that are being removed by activities associated with the Proposed Action. Success of the vernal pool creation would be assessed by comparing the pools with undisturbed natural vernal pools at Madera Ranch. Restored vernal pools will have similar success criteria. This mitigation would compensate for the loss of vernal pool habitat. Restoration is more likely to be successful in areas with degraded habitat and where preservation is the most assured. In addition, MID will comply with Reclamation's wetlands mitigation and enhancement policy, which focuses on protecting, restoring, and enhancing wetlands and ensuring no overall net loss of wetlands. Wetland mitigation creation and restoration sites will be monitored until it is proven successful to the Corps, USFWS, and DFG. Mitigation sites must function for at least three years without human intervention.

A.3.4 Environmental Commitment BIO-3a: Avoid Effects on Iodine Bush Scrub

MID will locate the well and pipeline to avoid direct effects on iodine bush scrub habitat in the northern portion of Section 7 associated with construction activities. If wells and pipelines need to be constructed in this habitat, MID will conduct botanical surveys and mark plants to be avoided during construction.

A.3.5 Environmental Commitment BIO-3b: Survey for Sensitive Plants

During Phase 1, two botanists will conduct visual surveys for palmate-bracted bird's beak (*Cordylanthus palmatus*) and other sensitive plant species along a 60-foot corridor (30 feet per side) along the proposed pipeline and canal alignments. The surveys will be conducted in April and July. Species information will be recorded in GPS. The results of the botanical surveys will be used to determine which avoidance, minimization, and environmental commitments will be employed. If palmate-bracted bird's beak is found, the population will be delineated with highly visible flagging tape or plastic fencing and avoided. If other sensitive species are found, MID, will coordinate with

permitting agencies to determine the feasibility of avoiding the population. During Phase 2, additional botanical surveys will be conducted in the area proposed for recharge basin creation. Complete visual surveys will be conducted in a similar manner in all areas proposed for permanent ground disturbance. If other sensitive species are found, MID, DFG and USFWS will coordinate to determine the feasibility of avoiding the population.

A.3.6 Environmental Commitment BIO-4a: Preconstruction Surveys for California Tiger Salamander

A USFWS-approved biologist will conduct preconstruction surveys for California tiger salamander (*Ambystoma californiense* [= *A. tigrinum* c.]) in suitable aquatic and upland habitat. Before the start of ground-disturbing activities or vegetation removal, the approved biologist or biological monitor will survey the area to be affected that day for California tiger salamanders. The biologist also will examine any open trenches, which will have ramps or be closed when unattended, for the presence of salamanders. If a salamander is found in the construction area, the approved biologist will remove the animal from the area and release it into a suitable burrow at least 300 feet outside the construction area. The biologist will document the results of surveys on preconstruction survey log sheets, which will be kept on file at MID.

A.3.7 Environmental Commitment BIO-4b: Restrict Construction Activity in Suitable Aquatic and Upland Habitat for California Tiger Salamander to the Dry Season (April 1–November 1)

To avoid and minimize potential mortality and injury of breeding and dispersing California tiger salamanders, construction will take place only during the dry season (between April 1 and November 1 or before the onset of the rainy season, whichever occurs first) in suitable aquatic and upland habitat for the species. Upland habitat is defined as all habitat within one mile of occupied or suitable aquatic habitat. Specifically, this measure applies to all pipeline construction on Madera Ranch and during work at all delivery canals.

This measure does not apply to construction activities in gravel shoulders and heavily disturbed non-habitat areas where construction is confined entirely to areas devoid of upland grassland habitat.

A.3.8 Environmental Commitment BIO-4c: Fence the Construction Zone and Implement Erosion Control Measures in Areas Where Suitable Aquatic Habitat for California Tiger Salamander Is Present

The construction zone will be fenced in areas where suitable aquatic habitat for California tiger salamander is adjacent to the construction area. The purpose of the fence is to restrict construction equipment to the designated area only. Erosion control measures also will be implemented in these areas to prevent any soil or other materials from entering aquatic habitat. Locations of temporary

fences and erosion control measures will be shown on the construction plans and will be reviewed by a qualified biologist. Construction barrier fencing will be installed along the edge of the work area as the first order of work. Temporary fences will be furnished, constructed, maintained, and later removed as shown on the plans, as specified in the special provisions, and as directed by the project engineer. No construction activities will be permitted outside the designated construction zone other than those activities necessary to erect the fencing. Erosion control measures will be installed adjacent to suitable aquatic habitat to prevent soil from eroding or falling into these areas. Natural/biodegradable erosion control measures (e.g., straw wattles, hay bales) will be used. Plastic monofilament netting (erosion control matting) will not be allowed because salamanders can be caught in this type of material.

A.3.9 Environmental Commitment BIO-5: Pre-Activity Surveys for Blunt-Nosed Leopard Lizard

Environmental Commitment Bio-5a: Install exclusion fencing and conduct clearance surveys and construction monitoring for blunt-nosed leopard lizards, **Environmental Commitment Bio-5b:** Conduct blunt-nosed leopard lizard and burrow surveys of swales proposed for inundation, and **Environmental Commitment Bio-5c:** Implement other protective measures for blunt-nosed leopard lizard have been consolidated into the following measures.

Linear Facilities

Prior to construction of linear facilities in grassland and/or saltbush scrub/Valley sink scrub habitat and adjacent dirt roadways MID, in consultation and coordination with qualified wildlife biologists, shall create exclusion corridors based on habitat suitability and the need to create exclusion zones for burrows, scalds, and wetlands. Construction of linear facilities is restricted to May 1st through August 1st and may commence in areas only after Blunt-Nosed Leopard Lizard ("BNLL") pre-construction surveys are completed. Pre-Construction BNLL surveys shall consist of the following minimum parameters:

- Surveys for adult BNLL shall be conducted between April 28th and July 1st and shall occur when the air temperature (as measured at 1-2 cm above the ground over a surface most representative of the area being surveyed) is between 25 °C - 35 °C (77 °F - 95 °F). Once the air temperature falls within the optimal range, surveys may begin after sunrise (once sun is high enough to shine directly on the ground surface being surveyed) and must end by 1400 hours or when the maximum air temperature is reached, whichever occurs first.
- Time of day and air temperature shall be recorded at the start and end of each survey.
- Surveys will not be conducted on overcast (cloud cover > 90%) or rainy days or when sustained wind velocity exceeds 10 mph (>3 on Beaufort wind scale).
- Surveys shall be conducted on foot and transects shall be no larger than 10 meters wide, consist of a slow pace, and be conducted on a north-south orientation when possible.
- Surveys shall be conducted for 12 days over the course of a 30 day period. Surveys shall be conducted for 4 consecutive days, weather permitting with at least one survey session consisting of a 4 consecutive day period.

- The starting/ending locations of surveys should be modified/alternated to the extent practicable, but resulting in the same area surveyed. This is so that different portions of the site are surveyed at different time/temp periods.
- Surveyors must be approved by the DFG and USFWS to conduct the BNLL reconnaissance surveys. The survey crew conducting focused BNLL surveys shall consist of no more than 3 Level I surveyors for every Level II surveyor. The names of every surveyor must be recorded for each survey day.
- All herpetofauna observations shall be recorded/tallied. All BNLL observations shall be recorded with GPS, time of observation, name of observer, sex (if evident), and lifestage (adult, juvenile, hatchling). If BNLL is observed in association with or observed entering a particular burrow, burrow location (via GPS) should be recorded as well.
- If a BNLL is observed within such areas, consultation with CDFG must immediately occur. However, if BNLL observations are made, BNLL surveys should not be halted; the entire survey should be completed for the entirety of the construction footprint; continuing the surveys is important to maximize detections and to best help inform where the lizards occur and may not occur. Partial surveys cannot be used to inform whether or not avoidance can or will occur.

(Hereafter 1- 9 collectively are referred to as, “BNLL Pre-Construction Survey Parameters”.)

Installation of Barrier: Within 3 days after BNLL pre-construction surveys are completed, biologists shall oversee the creation an exclusion area by installing a non-gaping non-climbable barrier using a material approved by DFG and the USFWS along 3 sides of the planned linear facility construction perimeter. The barrier installation shall be overseen by biologists who have BNLL experience and who have been approved in advance by USFWS and DFG (hereafter, qualified BNLL biologists). The barrier fencing shall be installed perpendicular to the ground (vertical) and shall be sealed to ensure there are no gaps between segments or under the fencing. An example of possible suitable material can be found at <http://www.ertecsystems.com/>. Small mammal burrows and burrow complexes shall be excluded from the liner facility construction areas to the maximum extent practicable and a no disturbance buffer zone shall be established and clearly delineated from any burrows / burrow complexes. The day following the installation of the fencing, the qualified BNLL biologists shall walk approximately 10 meter transects along the partially fenced linear facility construction area during the time of day when air temperatures fall within the optimum range for species detection, during the peak BNLL activity season, and as outlined above. If no BNLL are detected, the fourth side of fencing may be installed and MID may begin work within the fenced area. At least two DFG and USFWS approved biologists will be present within the construction area when construction and other activities within the exclusion area are in progress.

Walking Surveys Throughout Construction: Throughout construction, the biologists shall conduct walking surveys of the construction area, looking for BNLL. All open holes and trenches within habitat will be inspected at the beginning of the day, middle of the day, and end of day for trapped animals. If BNLL are detected at any time and within any area of the basin construction site, biologists will halt all work, open a section of the exclusion fencing, and allow the lizard to leave the area on its own (no chasing, following, etc. can occur).

Inadvertent Entrapment Prevention: To prevent inadvertent entrapment of BNLL or any other wildlife during the construction phase of the linear facilities, all excavated, steep-walled holes or

trenches more than 2 feet deep shall be covered at the close of each working day by plywood or similar materials or provided with one or more escape ramps (with no greater than a 3:1 slope) constructed of earth fill or wooden planks. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals by a qualified biologist. If BNLL are trapped, then it shall be allowed to escape on its own. In addition, all construction pipe, culverts, or similar structures with a diameter of 7.6 centimeters (3 inches) or greater that are stored at the construction site for one or more overnight periods will be thoroughly inspected for BNLL before the pipe is subsequently moved, buried, or capped. If during inspection one of these animals is discovered inside a pipe that section of pipe shall not be moved until the animal has escaped on its own.

Construction Time: The permitted construction time is from one hour after sunrise to one hour before sunset, and two biological monitors shall also be active at all times when construction or other activities are in progress. The biological monitors shall survey the construction area during construction, scanning the ground for BNLL and routinely checking excavated soils to ensure that BNLL are not present. The biological monitors shall stop work if a lizard is found within the construction area until the lizard has been excluded from the work area.

Multiple Construction Areas: More than one linear facility construction area may be established and under construction at the same time provided the minimum number of biologists and biological monitors are present at each of the sites at all times during construction or other related activities.

Notification of Dead or Injured BNLL: If any dead or injured BNLL are observed on or adjacent to the construction site, or along haul roads/travel routes for worker and/or equipment, regardless of assumed cause, DFG and USFWS shall be notified. The initial notification to DFG and USFWS shall include information regarding the location, species, and the number of animals injured or killed. Following initial notification, MID shall send DFG and USFWS a written report within 2 calendar days. The report shall include the date and time of the finding or incident, location of the carcass, and if possible provide a photograph, explanation as to cause of death, and any other pertinent information.

Fully Protected Species: These measures shall not be required if the species' fully protected status is rescinded and MID obtains incidental take authorization from DFG for this species for this project.

Recharge Basins

MID, in consultation and coordination with qualified wildlife biologists, shall create appropriately sized recharge basin construction areas before construction of recharge basins in grassland and/or saltbush scrub/Valley sink scrub habitat and adjacent dirt roadways within the former center pivot areas of Section 16, 17, and 18 on Madera Ranch. Construction areas shall be prioritized initially by reconnaissance surveys no more than 60 days prior to any basin construction activities or ground disturbance to identify areas with the fewest burrows and least suitable habitat for BNLL. Construction of basins will be restricted to May 1st through August 1st and may commence in areas identified through the above referenced reconnaissance surveys only after BNLL pre-construction surveys are completed by way of the *BNLL Pre-Construction Survey Parameters*.

The information gathered from these surveys will be used by DFG to determine which habitat is most likely occupied and to identify appropriate exclusion areas. (Basins shall initially be planned to be sited in the former center pivot areas of Section 16, 17, and 18.) If no BNLL is observed within

3 days after the completion of the BNLL pre-construction survey, biologists shall create an exclusion area by installing non-gaping non-climbable barrier. The installation for such barrier shall comply with the installation guidelines listed above under linear facilities, and must be supervised by a qualified BNLL biologist. (*See above.*)

Construction of the recharge basins is permitted from one hour after sunrise to one hour before sunset. More than one percolation basin construction area may be establish and under construction at the same time provided the minimum number of biologists and biological monitors are present at each of the sites at all times during construction or other related activities. Throughout construction, Biologists shall conduct walking surveys of the construction area to determine whether there is any detection of the BNLL. The survey procedures shall comply with paragraph listed above. Also during construction, all excavated, steep-walled holes or trenches more than 2 feet deep shall be covered as described above, to prevent inadvertent entrapment of BNLL or any other wildlife.

Finally, if any dead or injured BNLL are observed on or adjacent to the construction site, then MID must notified DFG and USFWS in accordance with the outline procedures listed above. If the BNLL fully protected status is rescinded and an incidental take permit is granted, then these measures will not be required.

On-Ranch Ground Disturbing Facility Maintenance

MID will have an agency approved biologist review future ground disturbing facility maintenance work locations and sizes to evaluate the potential for effects to BNLL. If the activity is in suitable habitat and could affect burrows, MID will conduct the work during the appropriate seasonal window and implement site-specific exclusion measures such as fencing and additional surveys as prescribed above for linear facilities.

Swales

MID will conduct BNLL and burrow surveys of swales prior to inundation in swales. Those portions of swales that have been inundated annually for extended periods prior to Project approval will not be surveyed because potential burrows likely have been inundated and eroded, and BNLL are unlikely to aestivate in these areas. Pre-wetting BNLL surveys will be consistent with the *BNLL Pre-Construction Survey Parameters* listed above. The information from these surveys will be used to determine which habitat is most likely occupied and to identify appropriate swale use areas. If no BNLL are found during the surveys, water may be applied throughout that following year. If a BNLL is sighted within the low point of a swale (i.e., the expected inundation area) it will be difficult to determine whether the burrows in the area are being used for nesting or refugia. Therefore, MID will delay using the swale for banking until the active season (April 28 to July 1); then MID will apply water to the swale slowly (i.e., approximately 12 inches per minute) to ensure lizards can escape burrows. These measures shall not be required if the species' fully protected status is rescinded and MID obtains incidental take authorization from DFG for this species for this project.

Other Protective Measures for Blunt-nosed Leopard Lizard

MID will implement other protective measures for BNLL. For example, MID will install untreated 2x4's every 1,000 feet across the Section 8 Canal Northern Extension to maintain habitat connectivity when the canal is being used; the 2x4's will be repaired or replaced as necessary by MID. Additionally, on-ranch canal side slopes will be designed to allow BNLL to avoid entrapment and permanent exclusion fencing may be located in some areas.

A.3.10 Environmental Commitment BIO-6: Preconstruction Surveys and Avoidance Activities for Raptors

Preconstruction surveys would determine whether any sensitive raptors are nesting at Madera Ranch. If a tree is occupied at the time of construction, construction activities will be restricted to areas outside 0.5 mile of the tree. Setbacks will be marked with brightly colored temporary fencing.

A.3.11 Environmental Commitment BIO-7: Preconstruction Surveys for Western Burrowing Owl

The initial daytime burrow survey will help inform the Western burrowing owl (*Athene cunicularia*) survey. A qualified wildlife biologist will conduct a burrowing owl survey in accordance with DFG guidelines. The survey area will include the construction corridor and a 500-foot buffer. An initial survey will determine whether burrowing owls are present. Three additional surveys will be conducted to determine presence or absence of burrowing owls. In accordance with DFG survey guidelines, these surveys must be conducted on four separate days—two in the early morning and two in the late afternoon/early evening. Non-nesting owls may be passively relocated, also using DFG's guidelines.

A.3.12 Environmental Commitment BIO-8: Preconstruction Surveys for San Joaquin Kit Fox

Because of historical records and suitable San Joaquin kit fox (*Vulpes macrotis mutica*) habitat on or in the vicinity of Madera Ranch, it is assumed that kit foxes could be present at Madera Ranch. To avoid potential mortality of kit fox, agency approved (by USFWS and DFG) experienced biologists will survey to locate any natal dens, non-natal active dens, and/or potential dens in the Proposed Action area. Visual surveys will be conducted during meandering transects of the 1,000 foot corridor. If an active natal den is found, USFWS and DFG will be notified and MID will delay construction within 1,000 feet of the den until the pups have been weaned or moved to an off-site den, and/or reroute the construction corridor to avoid impacts on the kit foxes.

Surveying will include meandering transect surveys for active dens (non-natal) out to 250 feet from the proposed facilities, which will involve simultaneous surveys for potential den sites out to 100 feet. If an active den is found, it will be avoided until the foxes have vacated the den. All potential dens will be flagged. Any potential den immediately in the construction corridor may need additional monitoring. Because construction is expected to proceed quickly—approximately 1,000 feet per day with trenches being open one to two nights—potential dens will not be collapsed. All surveys will be conducted within 30 days of site-specific construction by a qualified biologist. In

addition, during construction, USFWS standard kit fox conservation measures such as speed limits, exit ramps, controlling toxic (oil or gas) spills from construction equipment, and covering pipes will be implemented to prevent harm or disturbance to kit foxes using the area. Any open pipes, newly dug pipeline trenches, and canals will be surveyed daily prior to construction to ensure kit foxes are not present.

A.3.13 Environmental Commitment BIO 9: Conduct Pre-Activity Surveys for Fresno Kangaroo Rat

The objective of the Fresno kangaroo rat (*Dipodomys nitratoide exilis*) surveys is to determine whether the Fresno kangaroo rat is present on the portion of Madera Ranch that could be affected by use of the swales for water banking and construction of water delivery canals. Initial trapping focused on the swales and canals east of GF Canal and determined the species was not present. Subsequent trapping will occur 1-year before use of swales or construction of facilities west of GF Canal. Surveys in swales will be conducted 1 to 2 years before the first wetting of the swale and will be valid for 5 years after the wetting of the swale. If the swale is re-wetted within the 5-year period, it will not need to be surveyed for another 5-year period. No additional survey efforts will be conducted of any swale areas that have been surveyed twice with neither survey resulting in a single trapping of the Fresno kangaroo rat.

Kangaroo rat trapping efforts will be conducted by a surveyor holding a recovery permit for the Fresno kangaroo rat (10[a][1][A] permit). Meandering visual transect surveys for kangaroo rat burrow complexes and sign (e.g., tail drags, sand baths, seed caches) will be conducted by two to four biologists over all habitat within and out to 250 feet from the edge of the WSEP footprint, including swales, and within 100 feet of the top of GF Canal. All burrow complexes found will be recorded on a GPS unit, and data on the number of burrows, level of activity, and general suitability for kangaroo rats will be recorded in field notes (burrows suitable for kit fox also will be noted on GPS as part of this effort); information on vegetation type and percent cover also will be recorded.

Following completion of the survey, potential trapping-sites will be prioritized based on a combination of the level of kangaroo rat activity (as evidenced by burrow density and/or the presence of other sign, though some areas without obvious sign may also be trapped) and project area coverage. Live trap stations and trap lines then will be established (staked and recorded with a GPS unit) by permitted biologists at the highest priority sites. Traps (Sherman live traps [Model XLKR: 13 inches x 3.5 inches x 3 inches]) will be set near active burrows, dust baths, or tracks, particularly along evident runways. Ten or more traps (or a number determined by the surveyor) will be set in relatively tight clusters (5-foot trap spacing) at high activity areas. Traps also will be set at 10 to 15 meter intervals (two traps per station) along evident movement corridors.

Traps will be baited with a mixture of millet seed, crimped oats, wild birdseed, or other suitable seed. Bedding (crumpled unbleached paper towel) will be placed at the inside end of each trap and will not be allowed to contact the tripping mechanism. Paper towels will be replaced each time an animal is captured in the trap. Traps will be opened and baited at sunset and checked 1-2 times/evening as deemed appropriate by the lead biologist. All traps will be closed after they have been checked at dawn. Trapping will be conducted at each trap site for five consecutive nights. Trapping will not be conducted during the week of a full moon, unless the sky is overcast and

moonlight is substantially reduced. Trapping will not be conducted in December or January or in periods of cold or inclement weather detrimental to kangaroo rats and as stipulated in the surveyor's recovery permit. Although Fresno kangaroo rats are active year round, their populations generally are lowest at this time. All non-Fresno kangaroo rats captured will be marked with a nontoxic semi-permanent ink marker on the belly to identify the re-trapping of the same animal(s). Trapping will cease with the capture of a Fresno kangaroo rat and MID, the USFWS, and DFG will be notified as soon as possible, if not the same day, then the next workday, or no later than the Monday following the capture should it occur on a Friday or Saturday night. Any measurements obtained to provide evidence that the animal captured is a Fresno kangaroo rat will be achieved with minimal and delicate handling; fur and tissue samples will be taken only by a qualified, permitted biologist in accordance with their permit terms. A photo of the animal's hind legs (showing toes and including a ruler) will be taken and the animal will be immediately released; the animal's eyes will be shielded from the flash.

The lead biologist will notify MID of the proposed trapping schedule and will inform MID weekly which trapping areas have been completed. Any capture of Fresno kangaroo rat will be reported immediately to MID, the USFWS, DFG, and Reclamation.

A.3.14 Environmental Commitment BIO-10: Conduct Preconstruction Surveys for Sensitive Species along the Off-Ranch Portion of Gravelly Ford Canal

Proposed off-ranch work areas associated with GF Canal improvements will be evaluated by a USFWS-approved biologist to determine whether habitat suitable to support sensitive species is present. If suitable habitat is discovered, MID will evaluate work locations to determine which species could be present and whether additional surveys may be needed. Depending on the results of this survey, MID also may implement Environmental Commitment BIO-1: Establish a Grasslands Conservation Easement, Environmental Commitment BIO-5: Pre-Activity Surveys for Blunt-Nosed Leopard Lizard, Environmental Commitment BIO-6: Preconstruction Surveys and Avoidance Activities for Raptors, and Environmental Commitment BIO-7: Preconstruction Surveys for Western Burrowing Owl.

A.3.15 Environmental Commitment BIO-11: Implement Protective Measures for Anadromous Fish

MID would work with Reclamation and the National Marine Fisheries Service (NMFS) to determine appropriate protective measures for migratory fish once they are restored to the San Joaquin River, including seasonal restrictions on diversions or intake screening in the event water is moved to and from Madera Ranch via GF Canal (Alternative D). Inter-agency discussions would occur at least two years in advance of the reintroduction of these species to the San Joaquin River.

A.4 Cultural Resources

A.4.1 Environmental Commitment CR-1: Stop Construction If Cultural Resources Are Discovered

Should any artifacts or an unusual amount of bone, shell, or nonnative stone be uncovered during construction or other ground-disturbing activities, the construction contractor will immediately stop work in the immediate vicinity and a minimum 100-foot buffer area 100 feet from the find. The contractor will notify MID immediately. MID will notify Reclamation immediately of the inadvertent discovery. Reclamation will have a professionally qualified archaeologist evaluate the inadvertent discovery for National Registry of Historic Places (NRHP) eligibility.

If human remains are discovered during ground-disturbing activities, Reclamation and MID will comply with state laws¹ relating to the disposition of human remains, including Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (NAHC) pursuant to Public Resources Code (PRC) section 5097.

If human remains are discovered or recognized in any location other than a dedicated cemetery, Reclamation will not allow further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

- the County coroner has been informed and has determined that no investigation of the cause of death is required; and
- if the remains are of Native American origin,
 - the descendants from the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC 5097.98; or
 - the NAHC was unable to identify a descendant or the descendant failed to make a recommendation within 48 hours of being notified by the NAHC.

A.5 Geology

A.5.1 Environmental Commitment GEO-1: Amend Soils as Required in Topsoiled Areas

Topsoiled areas with insufficient vegetation cover will be amended with gypsum and/or elemental sulfur in combination with high-quality irrigation water to reduce soil salinity, alkalinity, and exchangeable sodium to acceptable levels, such that acceptable vegetation cover is established in such areas within one year after topsoil is applied. All soil sampling and amendment

¹ Madera Ranch does not include federal land, so only state human-remains laws apply.

recommendations will be conducted by, or under the supervision of, a certified professional soil scientist.

A.5.2 Environmental Commitment GEO-2: Stop Work in Event of Fossil Discovery

In the event that a fossil or material that could be a fossil is unexpectedly discovered during excavation operations, work will cease in the immediate vicinity of the find. A qualified paleontologist will be called to the site to evaluate the find and determine the sensitivity of the fossil. If the fossil is determined to be sensitive, the paleontologist will recover it from the site and submit it to an appropriate museum or other repository for curation.

A.6 Noise

A.6.1 Environmental Commitment NOI-1: Employ Noise-Reducing Construction Practices

The construction contractor will employ noise-reducing construction practices so that noise from construction does not exceed County noise-level standards at adjacent residences. Measures to be implemented would include the following.

- Restrict construction to beyond 3,900 feet from residences during nighttime hours (10 p.m. to 7 a.m.).
- Provide construction equipment with sound-control devices no less effective than those provided on the original equipment. No equipment will have an unmuffled exhaust.
- Implement appropriate additional noise environmental commitments, including (but not limited to) changing the location of stationary construction equipment, shutting off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources.

A.6.2 Environmental Commitment NOI-2: Employ Noise-Reducing Methods during Well Drilling Operations

The drilling contractor will employ noise-reducing construction practices so that noise from drilling does not exceed County noise-level standards at adjacent residences. Measures to be implemented may include those following.

- Restrict well drilling to beyond 2,900 feet from residences during nighttime hours (10 p.m. to 7 a.m.), where feasible.
- Use sound attenuation enclosures around noise-generating elements of the drilling operation.

A.6.3 Environmental Commitment NOI-3: Employ Noise-Reducing Methods during Well Pumping Operations

The Proposed Action applicant will employ noise-reducing practices so that noise from well operations does not exceed County noise-level standards at adjacent residences. Measures to be implemented may include:

- restricting well installations to beyond 1,250 feet from residences, where feasible;
- using electric pumps where well installations are within 1,250 feet of residences; and
- using sound attenuation enclosures designed to achieve noise reductions sufficient to comply with County standards for noise-generating elements of the well operation when no other feasible control method is available.

A.6.4 Environmental Commitment NOI-4: Employ Noise-Reducing Methods during Lift Station Operations

The applicant will employ noise-reducing practices so that noise from lift station operations does not exceed County noise-level standards at adjacent residences. Measures to be implemented may include:

- restricting lift station installations to beyond 1,600 feet from residences, where feasible;
- using electric pumps where lift station installations are within 1,600 feet of residences; or
- using sound attenuation enclosures designed to achieve noise reductions sufficient to comply with County standards for noise-generating elements of the lift station operation when no other feasible control method is available.

A.7 Public Health and Safety

A.7.1 Environmental Commitment PHS-1a: Implement Necessary Emergency Preparedness Plan(s)

MID will work with the Madera County Department of Public Health and the local fire districts to coordinate the preparation of emergency preparedness plan(s) that may be required by federal, state, and County statutes and regulations.

A.7.2 Environmental Commitment PHS-1b: Comply with Local Fire District Requirements MID will consult the local fire districts to ensure that all regulations are complied with during construction.

A.7.3 Environmental Commitment PHS-2: Implement an Agreement with the Madera County Mosquito and Vector Control District

MID will enter into an agreement with the Madera County Mosquito Abatement & Vector Control District (MCMAVCD) regarding a specific mosquito abatement program. The agreement will allow the MCMAVCD to access Madera Ranch and also will include quantitative abatement thresholds and financial compensation requirements for MCMAVCD activities, if necessary.

The MCMAVCD will monitor mosquito larvae production in the recharge basins, drainages, and distribution canals at no cost to MID, given that the amount of monitoring required is not excessive. Larvae populations will be tracked using methods and thresholds approved by the MCMAVCD, and suppression measures will be employed when thresholds are exceeded. Suppression measures may include environmental and biological methods, such as stocking mosquitofish, controlling emergent vegetation, and applying insecticides. Insecticide controls will be used only as a last resort, and use of insecticides over open water will be minimized to the extent feasible, given the mosquito abatement mandate of the MCMAVCD. The insecticides that may be used are only those that are approved for such uses by the U.S. Environmental Protection Agency (EPA). Mosquitofish, if used, will need to be stocked annually by the MCMAVCD.

If operations result in an increase in mosquito production such that an extensive monitoring program is needed, MID will hire a professional pest control service and will bear the cost of that service.

A.8 Public Services

A.8.1 Environmental Commitment PSU-1a: Notify Emergency-Response Agencies of Proposed Traffic-Route Changes

Before beginning construction activities, MID or the construction contractor will contact local emergency-response agencies (law enforcement and fire protection) to provide information on the timing and location of any traffic control measures required during construction activities. Emergency-response agencies will be notified of any change to traffic control measures as the construction phases proceed so that emergency-response providers can modify their response routes to ensure that response time would not be affected.

A.8.2 Environmental Commitment PSU-1b: Implement a Traffic Safety Plan

MID will require the construction contractor to prepare and implement a traffic safety plan (TSP) before the onset of construction activities. The TSP will address:

- appropriate vehicle size and speed,
- travel routes,
- detour or lane-closure plans,
- flag person requirements,
- locations of turnouts to be constructed,
- coordination with law enforcement and fire control agencies,
- coordination with California Department of Transportation (Caltrans) personnel (for work affecting state road rights-of way),
- emergency access to ensure public safety, and
- traffic and speed-limit signs.

A.9 Traffic

A.9.1 Environmental Commitment TRAF-1: Implement a Road Improvement Plan

MID will require the construction contractor to prepare and implement a road improvement plan (RIP) before the onset of the construction phase. The RIP will identify road segments, bridges, and culverts that need to be improved and turnout locations that need to be constructed (as applicable) to accommodate construction activities. The plan also will identify damage that is caused by construction vehicles and that needs to be repaired.

A.10 Water Quality

A.10.1 Environmental Commitment WQ-1a: Comply with National Pollutant Discharge Elimination System General Construction Permit

To reduce or eliminate construction-related water quality effects, before onset of any construction activities, MID or its contractor will obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit. MID will be responsible to ensure that construction activities comply with the conditions in this permit, which will require development of a stormwater pollution prevention plan (SWPPP), implementation of best management practices

(BMPs) identified in the SWPPP, and monitoring to ensure that effects on water quality are minimized.

As part of this process, MID will implement multiple erosion and sediment control BMPs in areas with potential to drain to surface water (see Section 3.6, Geology, for a discussion of erosion and sediment control BMPs). These BMPs will be selected to achieve maximum sediment removal and represent the Best Available Technology (BAT) that is economically achievable. BMPs to be implemented as part of this environmental commitment may include, but are not limited to, the following measures.

- Temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) would be employed to control erosion from disturbed areas.
- Drainage facilities in downstream off-site areas would be protected from sediment using BMPs acceptable to the Regional Water Quality Control Board (RWQCB).

MID or its agent will perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. MID will notify its contractors immediately if there is a noncompliance issue and will require compliance.

A.10.2 Environmental Commitment WQ-1b: Implement a Spill Prevention and Control Program

MID or its contractor will develop and implement a spill prevention control and countermeasures program (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities for all contractors. The program will be completed before any construction activities begin. Implementation of this measure will comply with state and federal water quality regulations and minimize the effects of the Proposed Action.

MID will review and approve the SPCCP before the onset of construction activities. MID will routinely inspect the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained. MID will notify its contractors immediately if there is a noncompliance issue and will require compliance.

The federal reportable spill quantity for petroleum products, as defined in the EPA's CFR (40 CFR 110), is any oil spill that (1) violates applicable water quality standards, (2) causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or (3) causes a sludge or emulsion to be deposited beneath the surface of the water or on adjoining shorelines.

If a spill is reportable, the contractor's superintendent will notify MID, and MID will need to contact the appropriate safety and clean-up crews to ensure the SPCCP is followed. A written description of reportable releases must be submitted to the RWQCB. This submittal must include a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases will be documented on a spill report form.

If a spill has occurred, MID will coordinate with responsible regulatory agencies to implement measures to control and abate contamination.

A.10.3 Environmental Commitment WQ-2: Implement Provisions for Dewatering

Before discharging any water from dewatering operations to surface water, MID or its contractors will obtain an NPDES permit and Waste Discharge Requirements (WDRs) from the RWQCB. Depending on the volume and characteristics of the discharge, coverage under the RWQCB's General Construction Permit or General Dewatering Permit is possible. As part of the permit, the permittee would design and implement measures as necessary so that the discharge limits identified in the relevant permit are met. As a performance standard, these measures will be selected to achieve maximum sediment removal and represent the BAT that is economically achievable. Implemented measures may include retention of water from dewatering operations until particulate matter has settled before it is discharged, use of infiltration areas, and other BMPs. Final selection of water quality control measures will be subject to approval by the RWQCB.

MID will verify that coverage under the appropriate NPDES permit has been obtained before allowing dewatering activities to begin. MID or its agent will perform routine inspections of the construction area to verify that the water quality control measures are properly implemented and maintained. MID will notify its contractors immediately if there is a noncompliance issue and will require compliance.

Appendix B

**Special-Status Plants Found or Likely Occurring
at Madera Ranch and Potential Effects of
Livestock Grazing, Madera County, CA**

Species	Special Status ¹	Habitat ² /Occurrence	Phenology ¹	Potential Effects of Livestock Grazing and Associated Threats ³	Signif. Grazing Concern
Heartscale (<i>Atriplex cordulata</i>)	CNPS 1B.2	Alkali grasslands with saline, alkali soils associated with slickspots Observed throughout Sections 15 and 29 and in Sections 16, 17, 20, 22, and 28	Life form: Annual herb Blooms: April–October	CNPS 2009: Threatened by competition from non-native plants. Possibly threatened by trampling Moderate grazing is not likely to harm this species; reliable information on grazing effects was not found	Possible—trampling
Lesser saltscale (<i>Atriplex minuscula</i>)	CNPS 1B.1	Alkali sinks and annual grasslands with sandy, alkali soils associated with slickspots Observed throughout 15 and 29 and in Sections 16, 17, 20, 22, and 28	Life form: Annual herb Blooms: May–October	CNPS 2009: Historical occurrences extirpated by agriculture Moderate grazing is not likely to harm this species; reliable information on grazing effects was not found	No, low grazing use of habitat
Subtle orache (<i>Atriplex subtilis</i>)	CNPS 1B.2	Open areas within alkaline plains; slickspots Observed in Sections 15, 16, 17, 20, 28, and 29.	Life form: Annual herb Blooms: June–August (sometimes Oct)	Moderate grazing is not likely to harm this species Reliable information on grazing effects was not found	No, low grazing use of habitat
Recurved larkspur (<i>Delphinium recurvatum</i>)	CNPS 1B.2	Annual grasslands with sandy or clay alkaline soils Observed at low levels in Sections 16 and 17	Life form: Perennial herb Blooms: March–June	CNPS 2009: Much habitat converted to agriculture; also threatened by grazing and trampling Moderate grazing is not likely to harm this species; reliable information on grazing effects was not found	Possible—palatable and trampling
Persistent-fruited saltscale (<i>Atriplex persistens</i>)	CNPS 1B.2	Claypan vernal pools on alkali soils Observed in vernal pools in Sections 11 and 20	Life form: Annual herb Blooms: June–October	CNPS 2009: Possibly threatened by agriculture and flood control activities Moderate grazing is not likely to harm this species; reliable information on grazing effects was not found	No, low grazing use of habitat

¹ Special Status (CNPS 2009):

FE = Federally Endangered

FC = Federal Candidate

FP = California Fully Protected

FPE = Federally Endangered (Proposed)

Species	Special Status ¹	Habitat ² /Occurrence	Phenology ¹	Potential Effects of Livestock Grazing and Associated Threats ³	Signif. Grazing Concern
FPD	=	Federally Proposed for Delisting			
FPT	=	Federally Threatened (Proposed)			
FT	=	Federally Threatened			
SC	=	Federal Species of Concern			
SCE	=	California Candidate Endangered			
SCT	=	California Candidate Threatened			
SE	=	California Endangered			
SSC	=	California Species of Special Concern			
ST	=	California Threatened			
California Native Plant Society (CNPS) Listing:					
1A.	=	Presumed extinct in California			
1B.	=	Rare or Endangered in California and elsewhere			
2.	=	Rare or Endangered in California, more common elsewhere			
3.	=	Plants for which we need more information - Review list			
4.	=	Plants of limited distribution - Watch list			
² Habitat and occurrence summarized from J&S (2000) unless otherwise noted.					
³ Potential grazing effects and associated threats summarized by L. Ford from personal interviews of relevant experts and personal observations unless cited otherwise.					

Appendix C

**Major Invasive Non-Native and Native Pest
Plants Found at Madera Ranch, Madera County,
CA: their Pest Rating, Habitat, and Potential
Effects and Control Practices; Ranked by
Combined Pest Ratings**

Appendix C. Major Invasive Non-Native and Native Pest Plants Found at Madera Ranch, Madera County, CA: their Pest Rating, Habitat, and Potential Effects and Control Practices; Ranked by Combined Pest Ratings

Species ¹	Pest Rating ²	Habitat and Infestation ³	Potential Infestation Effects and Control Practices
<i>Bromus madritensis</i> ssp. <i>rubens</i> (red brome)	CDFA: Not Rated Cal-IPC: High-A, B, A	Scrub, grassland, desert washes, woodlands Grasslands. Low densities – no infestation at present	Bossard, Randall, and Hoshovsky 2000: Alters wildfire patterns leading to vegetation type-conversion and mortality of native reptiles; alters microhabitat characteristics and nutrient cycling; competes with native annual species for soil nutrients and light; dried florets may annoy and injure livestock; manual control is only practical with small infestations; grazing is an alternative to hand pulling, but native species may also be grazed, and livestock presence may alter the soil, favoring this species.
<i>Bromus tectorum</i> (cheat grass)	CDFA: Not Rated Cal-IPC: High-A, B, A	Interior scrub, woodlands, grasslands, pinon/Joshua tree woodland, chaparral Grasslands. Low densities – no infestation at present	Bossard, Randall, and Hoshovsky 2000: Displaces native species; alters wildfire frequency, extent and timing, leading to loss of native shrubs and perennial herbaceous species and mortality of slow-moving animals; mechanical fallows can control cheatgrass and help establish perennial species; mowing within one week of flowering can minimize seed production; controlled burning in late spring might kill seedlings and deplete surface seedbank, however burning should be done cautiously as it can also increase dominance if not done correctly; livestock grazing in late fall and early spring can decrease number of plants, however, cheatgrass population can expand with heavy grazing; this species does not compete well with established perennial species, thus planting native perennial species may help control this species.
<i>Ludwigia</i> sp. Yellow waterweed.	CDFA: Not Rated Cal-IPC: High	Freshwater aquatic systems Ditch margins, swales (winter-flooded from Cottonwood Creek overflow). Low densities – no infestation at present	Cal-IPC 2009 (for <i>Ludwigia peploides</i> ssp. <i>Montevidensis</i>): Forms extremely dense mats; outcompetes native aquatic vegetation. Meisler 2008: herbicide application followed by manual removal can impede re-growth in deep channels, but re-growth in shallow channels can be much faster.
<i>Hirschfeldia incana</i> (Mediterranean mustard)	CDFA: Not Rated Cal-IPC: Moderate-B, B, A	Scrub, grasslands, riparian areas Low densities – no infestation at present	DiTomaso and Healy 2007: Increasing in range in southern California; control is possible with manual removal or cultivation prior to seed development; continued control can deplete seedbank.
<i>Sisymbrium irio</i> (London rocket)	CDFA: Not Rated Cal-IPC: Moderate-B, B, A	Scrub, grasslands Grasslands. Low densities – no infestation at present	DiTomaso and Healy 2007: widespread; control is possible through manual removal or cultivation prior to seed production.

Appendix C. Continued

Species ¹	Pest Rating ²	Habitat and Infestation ³	Potential Infestation Effects and Control Practices
<i>Centaurea melitensis</i> (tocalote)	CDFA: Not Rated Cal-IPC: Moderate-B, B, B	Grasslands, oak woodland Grasslands. Low densities – no infestation at present	Bossard, Randall, and Hoshovsky 2000: Displaces native plant and animal species; can be toxic to horses; control of this species is little studied, however, yellow starthistle control methods (other than biological control) are likely effective on tocalote; best control of yellow starthistle is with a combination of burning and herbicide, although control is uneconomical and impractical.
<i>Eucalyptus sp.</i> (gum tree)	CDFA: Not Rated Cal-IPC: Limited to Moderate	Riparian areas, coastal grasslands, scrub Ornamental plantings. Low densities – no infestation at present	Bossard, Randall, and Hoshovsky 2000 (for <i>Eucalyptus globules</i>): Displaces native plant communities and wildlife habitat; bark and branches are flammable and can spread spot fires; effective control can be achieved through felling trees, followed by treating freshly cut stumps with triclopyr or glysophate.

¹ J&S (2000); taxonomy from Hickman 1993.

² Pest Rating:

CDFA = California Department of Food and Agriculture (2009):

A = Action required

B = Action at discretion of Agriculture Commissioner

C = Action only when found in a nursery at discretion of Agriculture Commissioner

Cal-IPC = California Invasive Plant Council (2006):

A-1 = Most invasive pest plants, widespread

A-2 = Most invasive pest plants, regional

B = Pest plants of lesser invasiveness

Red Alert = Species with potential to spread explosively, infestations currently restricted

NMI = Need More Information

AG = Invasive Annual Grass

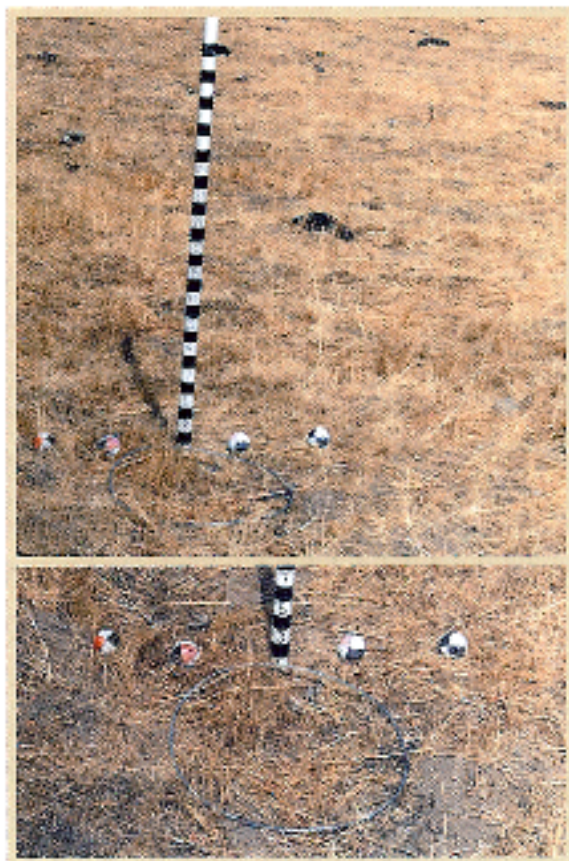
Considered = Considered, but not listed

³ Cal-IPC 2006; J&S 2000; Preston, pers. comm. 4 March 2009

Appendix D

RDM Height and Mass Standard Photograph

RDM is 350-700 lbs. per acre



Rangeland shows evidence of extensive grazing use. Residual vegetation is patchy with many areas grazed to less than 1" and other areas with 3-5" of vegetation remaining. Some bare soil apparent. Robel pole is only partially obscured at a height of 1-2". Many golf ball sized objects clearly visible at a distance of 10 feet and mostly visible at a distance of 20 feet.

Appendix E

**Natural Resources Conservation Service,
California, Conservation Practice Specification
#382A—Fence (July 2000)**

382A-1

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION

382A - FENCE

I. SCOPE

The work shall consist of furnishing materials and installing either barbed, smooth, or woven wire, or combinations thereof at the location as shown on the drawings or as staked in the field.

II. TYPES OF FENCES

- A. 4 wire barbed and/or smooth--min. height 42 inches. (Figure 1)
- B. 3 wire barbed and/or smooth--min. height 40 inches. (Figure 2)
- C. Woven wire and barbed wire--min. height 40 inches. (Figure 3)
- D. 4 wire barbed and/or smooth--min. height 42 inches. Bottom wire a minimum of 15 inches above ground.

III. MATERIALS

The materials used must be constructed to equal or exceed, in strength and durability in accordance with the following specifications:

A. Wire

Barbed wire, woven wire and wire netting fencing shall conform to the requirements of Federal Specification RR-F-221f, and further specified:

Type I - Barbed wire, style 2 - zinc coated. Barbed wire shall be 13 gage or wire of greater diameter (lesser gage), or 15 1/2 gage high tensile double strand. The minimum breaking strength for single 13 gage wire is 590 lbs, and for double 15 1/2 gage wire is 850 lbs, the wire shall have barbs at a spacing of 4-inch interval. The zinc-coating shall be at least 0.50 ounces per square foot of wire surface.

Type II - woven wire, style 4 - Farm fence. Woven wire shall be a minimum of 26 - inch high with 14 1/2 gage with stay wires spaced at an interval of 12 - inches or less. All woven wire shall be of new

galvanized material, with a zinc-coating of 0.40 ounces per square feet of wire surface.

Woven wire fences shall be topped by at least two lines of double strand barbed wires.

When splicing is necessary, the "Western Union" splice shall be used (Figure 6). The splice is made by overlapping the ends of each wire and wrapping each wire five times around the other wire. The use of a fence splicing tool will facilitate this operation and result in a neat job. (Figure 6). High compression splices (Figure 6) should be used when High tensile wire is used.

B. Staples

Staples shall be of nine gauge polished (bright) hard wire and should be 1 1/2 inches long for soft woods and 1 1/4 inches long for hardwood posts. The staples shall be driven diagonally with the wood grain to avoid splitting. Space should be left between the staple and the linepost to permit movement of the wire. Tie wires of galvanized 12 gauge may be substituted for staples.

C. Posts

Line Posts

Wood Type. Untreated posts from such species as juniper, cedar, oak, osage orange, black locust, and redwood or pine posts treated with a creosote coal-tar solution, or pentachlorophenol, with not less than six pounds retention per cubic foot, in accordance with Federal Specification TT-W-571 c, are acceptable.

Steel. Standard "Tee" or "U" section steel posts weighing not less than 1.29 pounds per foot of length, exclusive of anchor plate, may be used in lieu of wood line posts. Length shall be the same as for wooden posts.

Steel posts shall be rolled from high carbon steel and shall have a protective coating. The coating may be either galvanizing by the hot dip process or painting in accordance with Commercial Standard 184 with one of more coats of high graded, weather resistant steel paint or enamel applied and baked. Steel posts shall be

NRCS, CA
July 2000

382A-2

studded, embossed or punched for the attachment of wire to the posts. Wire shall be attached to the posts by wrapping with 16 gauge galvanized wire or by use of manufacturer's specially designed clips.

Size. Post length must be at least 5 feet 6 inches to construct a 42-inch high fence and be set solidly in the ground a minimum depth of two feet in deep soils or 18 inches in rocky shallow soil. Ninety-five percent of top diameters of wooden posts (two inches minimum above the top wire) must be three inches or larger. In shallow or rocky soil where penetration cannot be obtained with ordinary hand tools, straddlejacks may be used.

Spacing. On 4 wire and woven wire standard fences, maximum post interval shall not exceed 20 feet if no stays are used between post, or 30 feet if stays are used between posts at intervals not greater than 10 feet.

On 3 wire standard fences, maximum interval between posts shall not exceed 16 1/2 feet with or without stays.

D. Corner, Gate and Brace Posts (Figure 4,5,7)

Brace Posts

Wood. Same species as for line posts.

Size. Length shall be 6 feet 6 inches minimum to provide for the construction of at least a 42-inch high fence and permit setting at least 36 inches in the ground, top diameter commercial size six inches or larger.

Steel. Steel corner or brace posts with a three-inch new (or equivalent weight of 7.58 pounds per linear foot) pipe or larger, with brace member welded to the posts. Posts to be set in concrete. (Figure 7)

If soil conditions prevent proper brace or line post installations, trees may be used.

Rock cribs may be used in shallow rocky areas. (refer to BLM 2400--Range)

Bracing. Required at all corners, gates and at all definite angles in the line fence. In straight sections brace units (pull posts) shall be spaced at intervals not to exceed 1,320 feet. Horizontal braces can be a six-inch diameter top line post of the above species with minimum length of 6.0 feet notched into the top one-half of the brace post and post being braced, or two inch new or used pipe or angle iron (2" x 2" x 1/4")

installed not less than three feet above ground line and no higher than the top wire. A tension member composed of two complete loops of number 12 1/2 gauge double strand barbed or smooth wire, shall extend from a point approximately six inches below the top of the brace post to ground level of the post being braced. The brace wire shall be twisted to secure the brace and provide needed rigidity. (Figure 4).

A diagonal fence strainer is equal in strength and holding force to a horizontal strainer (fig.1). On a high-tensile, smooth-wire fence, one or two diagonal strainer(s) can be used for a corner in place of two horizontal braces (fig. 2). In the design and installation of a diagonal brace or strainer, several principles should be kept in mind. (Figure 5).

1. Make the diagonal (horizontal as well) brace as long as possible.
2. Be sure that the end of the diagonal brace in contact with the ground is free to move forward and is not blocked by a stack or post.
3. The diagonal brace can bear against the corner post in any location from the middle of the post to the top. However, probably the best place to have the diagonal brace contact the corner post is at the top.
4. When installing a diagonal strainer, the corner post should be set first, then the diagonal brace installed, then the bottom holding wire brace installed, and then the wires attached and tensioned. If this procedure is followed, the lower wire brace will not have to be twisted to tighten.
5. The diameter of the corner post should be as large as possible.
6. If one diagonal strainer will not hold the fence tension, a second diagonal strainer should be installed with each strainer taking half the tension of the fence (fig.3).
7. When using the diagonal strainer as a line brace, care must be exercised not to over-tension the brace wires. The vertical post can be jacked out of the ground.

IV. INSTALLATION

The installation of the fence shall conform to the figures and to the drawings. All posts shall be placed to the required depth and shall be firmly embedded so

that there is less than 1 inch of horizontal movement at the top of post when a horizontal force of 80 lbs is applied.

The completed job shall be workmanlike and present a good appearance. The installer and other persons will conduct all work in accordance with proper safety procedures.

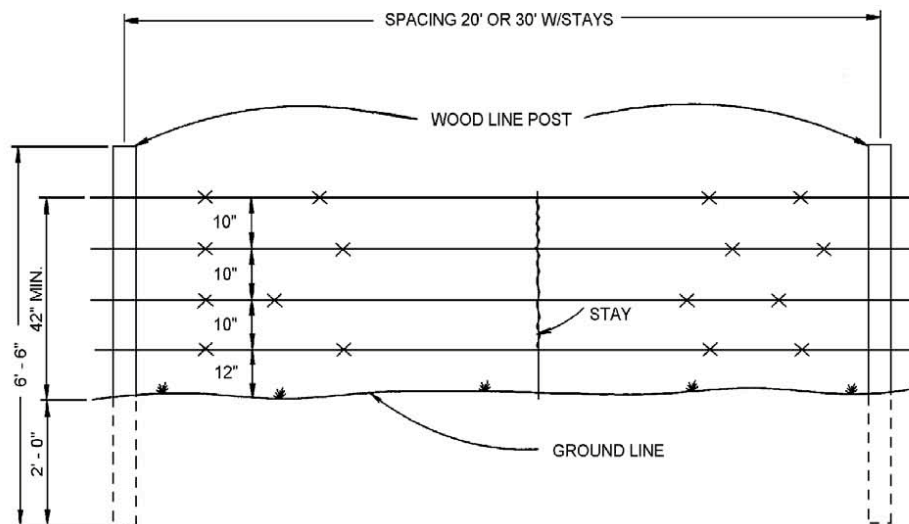
V. BASIS OF ACCEPTANCE

After the fence has been installed, a site inspection will be made to determine if the materials and placement adhered to the specification.

VI. MAINTENANCE

A properly maintained fence is an asset to your property. This practice will require you to perform periodic maintenance. Some items to be observed and corrected are:

- * tension of wire, broken wires.
- * post alignment, post stability.

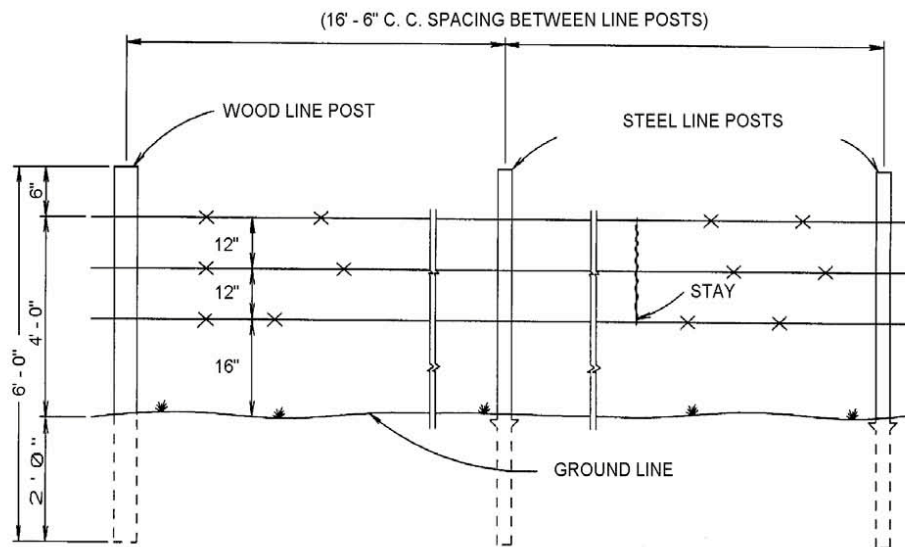


STANDARD 4 WIRE FENCE

FIGURE 1.

Appendix E. Continued

382A-4



STANDARD 3 WIRE FENCE

FIGURE 2.

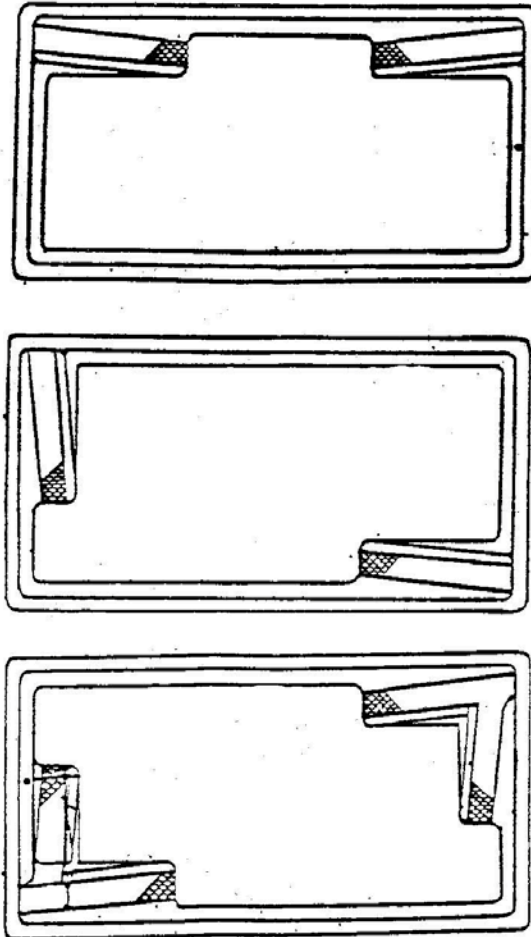
Appendix F

**Photos of Example Watering Facility with
Hardened Surface and Wildlife Escape Ramp and
Preferred Wildlife Ramp Locations by the Idaho
BLM (Sherrets 1989)**

Appendix F. Photos of Example Watering Facility with Hardened Surface and Wildlife Escape Ramp and Preferred Wildlife Ramp Locations by the Idaho BLM (Sherrets 1989)



Preferred wildlife ramp locations.



These ramps could be molded in concrete or fiberglass troughs. For metal troughs the ramps may be constructed of wood or metal and attached. Note: these ramps are fully enclosed to prevent entrapment.

ILLUSTRATION 19: Preferred wildlife ramp locations

Appendix G

**Natural Resources Conservation Service,
California, Conservation Practice Standard Code
614—Watering Facility (September 2007)**

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

WATERING FACILITY

(No.)

CODE 614

DEFINITION

A permanent or portable device to provide an adequate amount and quality of drinking water for livestock and or wildlife.

PURPOSE

To provide access to drinking water for livestock and/or wildlife in order to:

- Meet daily water requirements
- Improve animal distribution

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and/or wildlife.

CRITERIA

General Criteria Applicable To All Purposes

Design watering facilities with adequate capacity and supply to meet the daily water requirements of the livestock and/or wildlife planned to use the facility. Include the storage volume necessary to provide water between periods of replenishment. Refer to the National Range and Pasture Handbook for guidance on livestock water quantity and quality requirements. For wildlife, base water quantity and quality requirements on targeted species needs.

Locate facilities to promote even grazing distribution and reduce grazing pressure on sensitive areas.

Design the watering facility to provide adequate safe access and escape opportunities by the animals planned to use the facility. Incorporate escape features such as ramps out of the watering facility design.

Include design elements to meet the specific needs of the animals that are planned to use the watering facility, both livestock and wildlife.

Protect areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns. Use criteria in NRCS Conservation Practice Standard 561, Heavy Use Area Protection to design the protection.

Install permanent watering facilities on a firm, level, foundation that will not settle differentially. Examples of suitable foundation materials are bedrock, compacted gravel and stable, well compacted soils.

Design and install watering facilities to prevent overturning by wind and animals.

Design watering facilities and all valves and controls to withstand or be protected from damage by livestock, wildlife, freezing and ice damage.

Construct watering facilities from durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Follow appropriate NRCS design procedures for the material being used or industry standards where NRCS standards do not exist.

Use the criteria in NRCS Conservation Practice Standard 516, Pipeline to design piping associated with the watering facility. Include backflow prevention devices on

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [electronic Field Office Technical Guide](#).

**NRCS, CA
September 2007**

614 - 2

facilities connected to wells, domestic or municipal water systems.

Criteria for Wildlife Facilities

Site Location

1. The site chosen for wildlife watering development or gallinaceous guzzler will serve as a covey center. Escape cover must be provided adjacent to the water. A clump (5 or more plants) of gooseberry, wild rose, mesquite, quailbush, scrub oak or other shrubs furnishes favorable escape, forage and loafing cover near the installation and increases its effectiveness as a covey center. Brush piles can be used for temporary cover until vegetation can be established at the site. If quail roosting cover is limited, a site within 100 to 200 yards of a good roost tree is desirable. Chukars roost in the open on the ground.
2. An abundant food supply must be present and the necessity for water in the area should be positively established. The area will be thoroughly checked for permanent water, however, one should remember a small amount of water is sufficient if it is permanent.
3. If possible, guzzlers will be located where excavation work and maintenance can be easily accomplished. A gentle slope for soil surface type water collecting aprons is desirable. Do not locate the guzzler where silt or debris laden floodwater will flow into the tank, or in heavy cover where leaves from trees too close to the installation will fill the collecting basin.
4. If water is to be hauled to a storage tank, it must be located near an access road.

Water Storage Tank Capacity

The recommended size of a water storage tank for a guzzler can be estimated by the minimum average rainfall, as follows:

NRCS, CA

September 2007

Minimum Average Rainfall	Tank Storage Capacity Req.
10 inches or over	500 gallons
5-10 inches	750 gallons

Water Collecting Apron

A water collecting apron can be used to fill and maintain water in a guzzler tank. The size of the water collecting apron is determined by the least annual rainfall on record for the site, and the tank storage capacity. Use the following formula in making this determination for circular, rectangular, or metal roof-type aprons.

A. Size (radius) of circular collecting apron:

$$r = \frac{(8 \text{ feet}/100 \text{ gallons})g}{a}$$

WHERE: r = radius in feet, a = least annual rainfall in inches, and g = size of tank in gallons.

B. Area of rectangular collecting apron:

$$A = \frac{(316 \text{ SF}/100 \text{ gal})g}{a}$$

WHERE: A = area in square feet, a = least annual rainfall in inches, and g = size of tank in gallons.

C. Standard 16x16 foot metal collecting apron will supply:

A 500 gallon tank in 6 inches or more annual rainfall

A 750 gallon tank in 9 inches or more annual rainfall, or

A 1000 gallon tank in 12 inches or more annual rainfall

Temporary guzzlers

Temporary "guzzlers" can be created by modifying barrels and filling them as needed with water hauled to the site. A fifty-five gallon steel drum can be connected by pipe to a small basin at ground level. Water flow is regulated by atmospheric pressure or a float valve. Barrels should not contain any residue of contaminant harmful to wildlife.

CONSIDERATIONS

Design fences associated with the watering facilities to allow safe access and exit for area wildlife species. To protect bats and other species that access water by skimming across the surface, fencing material should not extend across the water surface. If fencing across the water is necessary it should be made highly visible by avoiding the use of single wire fences and using fencing materials such as woven wire or by adding streamers or coverings on the fence.

For watering facilities that will be accessible to wildlife, give consideration to the effects the location of the facility will have on target and non-target species. Also consider the effect of introducing a new water source within the ecosystem in the vicinity of the facility. This should include things such as the concentration of grazing, predation, entrapment, drowning, disease transmission, hunting and expansion of the wildlife populations beyond the carrying capacity of available habitat.

Consider the following guidelines for materials commonly used for watering facilities.

Concrete	3000 psi compressive strength
Galvanized Steel	20 gauge thickness
Plastic	Ultraviolet resistance
Fiberglass	Ultraviolet resistance

Where water is supplied continuously or under pressure to the watering facility consider the use of automatic water level controls to control the flow of water to the facility and to prevent unnecessary overflows.

Watering facilities often collect debris and algae and should be cleaned on a regular basis. Consider increasing the pipe sizes for inlets and outlets to reduce the chances of clogging. Maintenance of a watering facility can be made easier by providing a method to completely drain the watering facility.

Steep slopes leading to watering facilities can cause erosion problems from over use by

animals as well as problems with piping and valves from excess pressure. Choose the location of watering facilities to minimize these problems from steep topography.

Considerations For Wildlife Facilities

Typical wildlife water use:

Antelope	1-2 gal/animal/day
Mule deer	1-2 gal/animal/day
Elk	5-8 gal/animal/day
Chukar	750 gal/covey/year
Quail	750 gal/covey/year
Wild turkey	500 gal/flock/year
Pheasant	2-5 gal/day yearlong
Mourning dove	2-5 gal/day yearlong
Songbirds	1-2 gal/day yearlong

Site Spacing

- Wildlife watering facilities may be provided if:
 - The range of the desired species of wildlife might be extended by providing additional water developments;
 - present population densities of the desired species can be increased by further water development; or
 - new habitat can be created.
- The distance the desired species will travel for water is the main criteria that should be used for spacing of wildlife watering facilities.
 - California quail - The suggested spacing pattern for California quail is at least one installation per 160 acres. Water should be located one to two miles apart on California quail ranges. Water should be placed at one-half mile intervals for optimum utilization.
 - Mountain quail and chukar - Water should be available at about two mile intervals in mountain quail and chukar range, however, the type of terrain, feed and cover may alter the necessary distribution of water for good coverage of the area.
 - Gambel's and desert quail - Less conclusive evidence is available on the

NRCS, CA

September 2007

614 - 4

summer radius of Gambel's or desert quail, but from data based on field observations, it is thought that watering sites should be available at intervals of three to five miles.

3. Consider these estimates of distance some wildlife will travel to water:

Species	Optimum (Miles)	Maximum (Miles)
Antelope	2	3
Mule deer	1	3
Elk	1	3
Chukar	1	2
Mountain quail	1	2
California quail	0.5	1
Gambel's quail	1	4
Desert quail	1	4
Pheasant	0.5	1
Turkey	1	2
Mourning dove	3	5
Songbirds	0.25	0.5

Cultural Resources

NRCS policy is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice or associated practices in the plan could have an effect on cultural resources. The National Historic Preservation Act may require consultation with the California State Historic Preservation Officer. The primary website for cultural resources information is <http://www.nrcs.usda.gov/technical/cultural.html>. The California Environmental Handbook and the California Environmental Assessment Worksheet also provide guidance on how the NRCS must account for cultural resources. The e-Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

Endangered Species

If during the Environmental Assessment NRCS determines that installation of this practice, along with any others proposed, will have an effect on any federal or state listed Rare, Threatened or Endangered species or their habitat, NRCS will advise the client of the

requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the client selects one of the alternative conservation treatments for installation; or with concurrence of the client, NRCS initiates consultations concerning the listed species with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game.

PLANS AND SPECIFICATIONS

Plans and specifications for watering facilities shall provide the information necessary to install the facility. As a minimum this shall include the following:

- A map or aerial photograph showing the location of the facility
- Detail drawings showing the facility, necessary appurtenances (such as foundations, pipes and valves) and stabilization of any areas disturbed by the installation of the facility
- Construction specifications describing the installation of the facility

OPERATION AND MAINTENANCE

Provide an O&M plan specific to the type of watering facility to the landowner. As a minimum include the following items in the plan:

- a monitoring schedule to ensure maintenance of adequate inflow and outflow;
- checking for leaks and repair as necessary;
- if present, the checking of the automatic water level device to insure proper operation;
- checking to ensure that adjacent areas are protected against erosion;
- if present, checking to ensure the outlet pipe is freely operating and not causing erosion problems;

NRCS, CA

September 2007

Appendix G. Continued

- a schedule for periodic cleaning of the facility.

REFERENCES

Brigham, William and Stevenson, Craig, 1997, Wildlife Water Catchment Construction in Nevada. Technical Note 397.

Tsukamoto, George and Stiver, San Juan, 1990, Wildlife water Development, Proceedings of the Wildlife Water Development Symposium, Las Vegas, NV, USDI Bureau of Land Management.

Yoakum, J. and W.P. Dasmann. 1971. Habitat manipulation practices. Ch. 14 in Wildlife Management Techniques, Third Edition. Ed. Robert H. Giles, Jr. Pub. The Wildlife Society. 633 pp.

National Engineering Handbook, Part 650 Engineering Field Handbook, Chapters 5, 11 & 12, USDA Natural Resources Conservation Service.

National Range and Pasture Handbook, Chapter 6, Page 6-12, Table 6-7 & 6-8, USDA-Natural Resources Conservation Service.

National Research Council, 1996 Nutrient Requirements of Domestic Animals, National Academy Press.

Taylor, D.A.R. and M.D. Tuttle, 2007 Water for Wildlife: A Handbook for Ranchers and Range Managers, Bat Conservation International, 17pp,
<http://www.batcon.org/home/index.asp?idPage=62&idSubPage=143>

Appendix H

Monitoring and Operational Constraints Plan

Monitoring and Operational Constraint Plan

**Madera Irrigation District
Water Supply Enhancement Project**

(FINAL)

October 8, 2010

Madera Ranch Oversight Committee Resolution

WHEREAS, the Madera Irrigation District (MID) is implementing the Madera Irrigation District Water Supply Enhancement Project (the Project).

WHEREAS, the Madera Ranch Oversight Committee (the Committee) is responsible for approval and oversight of MID implementation of a Project Monitoring and Operational Constraint Plan (MOCP).

NOW THEREFORE, BE IT RESOLVED that the Committee agrees and authorizes that the Committee has reviewed and approves the MOCP dated 10-08-10.

DATED: 10-08-10

Don Kroger
Michael Esch
Tom Kroger
Michael Esch
Sam Ben
Paul Jagers
Jim De
Alfonso
Mike

ATTEST:

Cynthia A. Rasch

Table of Contents

1	Introduction	6
1.1	Project and Oversight Committee Background	6
1.2	MOCP Objectives, Elements and Intended Use	6
1.2.1	MOCP Requirements and Objectives	7
1.2.2	MOCP Elements	11
1.3	MOCP Implementation Roles and Responsibilities	11
1.4	Summary of MROC Voting Requirements	11
1.5	Access and Confidentiality of Information Collected from 3 rd Party Properties	12
1.6	Well Naming Conventions	12
1.7	MOCP Revision Procedures	13
1.8	MOCP Revision Log	14
2	MOCP Implementation Schedule	15
3	Water Level Monitoring	16
3.1	Objectives	16
3.2	Responsibilities	16
3.3	Monitoring Locations and Frequencies	16
3.4	Baseline Well Documentation and Inspection	20
3.5	Monitoring Procedures	21
3.6	Data Management	22
3.7	Required Accuracy, Quality Control and Quality Assurance	22
4	Groundwater and Surface Water Quality Monitoring	24
4.1	Objectives	24
4.2	Responsibilities	24
4.3	Monitoring Locations, Frequencies and Analytical Suites	24
4.4	Sampling and Analytical Procedures	28
4.5	Data Management	28
4.6	Quality Control and Quality Assurance	28
5	Flow Rate Monitoring and Water Accounting	29
5.1	Objectives	29
5.2	Responsibilities	29
5.3	Monitoring Locations and Frequencies	29
5.4	Monitoring Procedures	31
5.5	Water Accounting Procedures	31
5.6	Data Management	33
5.7	Required Accuracy, Quality Control and Quality Assurance	33
6	Surrounding Land Use and Well Status Monitoring	34
6.1	Objective	34
6.2	Responsibilities	34
6.3	Monitoring Locations, Frequencies and Procedures	34
6.4	Data Management	35
7	Meteorological Monitoring	36
7.1	Objective	36
7.2	Responsibilities	36
7.3	Monitoring Locations and Frequencies	36
7.4	Monitoring Procedures	38
7.5	Data Management	38
7.6	Estimation of Evapotranspiration	38
8	Subsidence Monitoring	39

8.1	Objective	39
8.2	Responsibilities	39
8.3	Monitoring Locations and Frequencies	39
8.4	Monitoring Procedures.....	40
8.5	Data Management.....	40
8.6	Required Accuracy, Quality Control and Quality Assurance	40
9	Reporting.....	41
9.1	Responsibilities	41
9.2	Quarterly Water Level Reports	41
9.3	Semi-Annual Water Quality Reports	42
9.4	Annual Water Accounting Reports	43
9.5	Triennial Status Reports	44
9.6	Reporting Formats and Availability	44
9.7	3 rd Party Information Requests	44
9.8	Responsibilities	45
9.9	MID Evaluations.....	47
9.9.1	Water Level Evaluations	48
9.9.2	Water Quality Evaluations.....	49
9.9.3	Subsidence Evaluations.....	51
9.10	MID Response to 3 rd Party Complaints and MROC Dispute Resolution	51
10	Funding of Monitoring, Committee Activities and Mitigation	53

Tables

Table 1:	MROC Approved Key Project Principles	8
Table 2:	Summary of MOCP Requirements	9
Table 3:	MOCP Implementation Roles and Responsibilities	11
Table 4:	MROC Voting Requirements.....	12
Table 5:	MOCP Implementation Schedule	15
Table 6:	Water Level Monitoring Program.....	18
Table 7:	Water Quality Monitoring Program	26
Table 8:	Water Quality Analytical Suites	27
Table 9:	Flow Monitoring Locations, Frequencies and Accuracies.....	30
Table 10:	Monthly Water Accounting Requirements	32
Table 11:	Meteorological Monitoring Program Locations, Parameters and Frequencies	37

Figures

Figure 1:	Well Naming Convention Example.....	13
Figure 2:	Water Level Monitoring Network	17
Figure 3:	Water Quality Monitoring Network.....	25
Figure 4:	Operational Adjustment and Mitigation Decision Matrix	46

List of Acronyms

APN: Assessor Parcel Number
CI MIS: California Irrigation Management Information System
CORS: Continuously Operated Reference Station
DWR: California Department of Water Resources
EC: electrical conductivity
EIR: Environmental Impact Report
ET: evapotranspiration
ETAW: evapotranspiration of applied water
GFWD: Gravelly Ford Water District
MID: Madera Irrigation District
MOCP: Monitoring and Operational Constraint Plan
MROC: Madera Ranch Oversight Committee
NOAA: National Oceanic and Atmospheric Administration
QAQC: Quality Assurance/Quality Control
Reclamation: Bureau of Reclamation
TDS: Total dissolved solids
USGS: United States Geological Survey

1 Introduction

This document is the Monitoring and Operational Constraint Plan (MOCP) for the Madera Irrigation District Water Supply Enhancement Project (the Project) as defined in the Final Environmental Impact Report (EIR, September 2005) and associated Mitigation Monitoring and Reporting Plan.

As detailed in the EIR, the Project will recharge up to 55,000 acre-feet per year of water through swales, ponds and agricultural land for storage in the currently dewatered portion of the upper aquifer. No "in-lieu recharge" will be allowed. Up to 55,000 acre-feet per year will be recovered with wells when needed. Ten percent of all recharged water will be left behind. The Project will entail construction and operation of various recharge facilities and recovery wells on a property known as Madera Ranch, a property owned by MID.

As detailed in the EIR, MID will monitor groundwater levels and quality to evaluate Project impacts and guide operational adjustments to prevent unacceptable impacts. This monitoring will be performed in coordination with the Madera Ranch Oversight Committee (MROC) as detailed below.

1.1 Project and Oversight Committee Background

On February 15, 2005, the MID Board approved formation of a nine-member MROC and on April 17, 2006 the MROC was expanded to 10 members with the following representation:

- the five MID board members;
- one elected board member from the Gravelly Ford Water District (GFWD);
- two independent members representing the interests of surrounding landowners and one at large member; and
- one elected Madera County Supervisor.

The EIR specified that the MROC would develop this MOCP to protect adjacent landowners from unacceptable impacts.

1.2 MOCP Objectives, Elements and Intended Use

It is appropriate and desirable to prevent, mitigate or eliminate short-term and long-term unacceptable Project impacts to adjacent lands and to provide a meaningful and appropriate compensation mechanism to ensure that unacceptable impacts that occur, despite efforts to prevent them, are compensated in a timely manner. MID and the MROC desire that the design, operation and monitoring of the Project be conducted and coordinated in a manner to ensure that the beneficial effects of the Project are maximized but that the Project does not result in unacceptable impacts to water levels, water quality or elevation of adjacent lands relative to conditions that would have occurred absent the Project. Therefore, Project operations will be subject to the so-called "Golden Rule" of water banking projects, meaning that, unless acceptable mitigation is provided, MID may not operate the Project so as to create conditions that are worse than would have prevailed absent the Project.

This MOCP sets forth the minimum monitoring and operational constraint requirements which the MROC has specified and which MID has agreed to. MID at their own discretion can choose to perform additional monitoring and operational constraint as the District deems appropriate.

1.2.1 MOCP Requirements and Objectives

Table 1 presents the Key Project Principles approved by the MROC (April 17, 2006). In addition, through the Final EIR (September 2005) and various MROC votes, MID has committed to various additional monitoring obligations and constraints. Table 2 summarizes these requirements and objectives.

This MOCP covers monitoring and operational constraints associated with water resources that might be impacted by the Project. Monitoring of aesthetic, air, biological and cultural resources are covered by the separate Project Mitigation Monitoring and Reporting Plan issued with the Final EIR (September 2005).

Table 1: MROC Approved Key Project Principles

The Madera Ranch Oversight Committee reaffirms its prior agreement to the first three principles set forth below, which it adopted on April 11, 2005. These three principles, as well as Principle No. 4 set forth below, shall be included in the memorandum of understanding for the Committee and treated as key principles for the Madera Irrigation District (MID) Water Supply Enhancement Project to move forward.

Committee decisions and rulings will be made through a simple majority vote except for the following:

1. Approval to connect the groundwater supply from the MID Water Supply Enhancement Project at Madera Ranch to or from the Mendota Pool shall require a 9-0 vote.
2. Approval to extract groundwater at Madera Ranch for the purpose of delivery outside of Madera County as part of the MID Water Supply Enhancement Project shall require a 10-0 vote.
3. Approval to expand the MID Water Supply Enhancement Project shall require a minimum of 8 positive votes of Committee members in agreement of the expansion.
4. Approval to develop project land that has never been farmed shall require a minimum of 6 positive votes of Committee members in agreement. "Develop" is defined as follows: MID changing the characteristics of those portions of the project land that have never been farmed to agricultural or other use besides cattle grazing. "Other use" does not include MID using such land for any purpose associated with its Water Supply enhancement Project, such as construction of canals, installation of pipelines or wells, or use for spreading or percolation basins. Further, "other use" does not include restricting the land for conservation purposes.

Dated: April 17, 2006

Table 2: Summary of MOCP Requirements

Item	Committee Specification
Groundwater level measurement frequency	Weekly to monthly (Items 1.C.1.a and 1.C.1.b of Draft Operational Guidelines and (Item 2.C of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, approved by MROC on 8/22/05)
Groundwater level measurement locations	Ranch plus 2 mile radius (Items 1.C.2.a of Draft Operational Guidelines and (Item 2.C of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, approved by MROC on 8/22/05)
Groundwater sampling parameters and locations	Sample and analyze extracted water and groundwater flowing away from Ranch for total dissolved solids (TDS), levels to be set by committee (Item 1.D. 1 of Draft Operational Guidelines, edited and approved by MROC on 8/22/05) Sample and analyze drinking wells within 1-mile radius for fecal coliform, TDS and select components of TDS as Committee specifies (Item 1.D.2 of Draft Operational Guidelines approved by MROC on 8/22/05 and Draft EIR pp. 2-24)
Surface water sampling frequency	A minimum of twice a year or more if the water supply changes from Sierra Watershed source (approved by MROC on 8/22/05)
Surface water sampling parameters	Total dissolved solids (approved by MROC on 8/22/05) Perform ongoing surveillance of MID conveyances to ensure that, if accidental spills of hazardous materials occur, these spills do not enter the recharge facilities (Draft EIR pp. 3.12-16)
Surface water sampling locations	Incoming water to the ranch (approved by MROC on 8/22/05)
Subsidence monitoring	MID envisions that Project operations would include high accuracy Global Positioning System (GPS) monitoring of multiple locations on Madera Ranch before and during Project operation. The elevations of on-site markers would be measured on an annual basis and compared to distant USGS benchmarks to allow detection of any change in ground elevations. (Draft EIR pp. 2-25)
Water balance	Gross/Net inflow/outflow to Project (Item 1.B of Draft Operational Guidelines, and Item 2.B of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, approved by MROC on 8/22/05) Ten percent leave behind of recharged water to prevent "over recovery" (Item 1.E. 2 of Draft Operational Guidelines approved by MROC on 8/22/05 and Draft EIR pp.2-25)
Operational constraints and adjustments	Prevent water levels at the property boundary from rising above 30 feet below ground surface (August 2005 MID Response to Gravelly Ford Water District July 29, 2005 comment 11 on the Draft EIR, approved by MROC on 8/22/05) Committee to make recommendations for adjustment to operations if data suggest unacceptable impacts (Item 2.C.2 of Draft Operational Guidelines, approved by MROC on 8/22/05)
Reporting	Triennial Monitoring Report providing executive summary of ranch status (Item 2.H of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, edited and approved by MROC on 8/22/05) Report all groundwater levels a minimum of 4 times per year or as the Committee Chair requests (Item 1.A of Draft Operational Guidelines, approved by MROC on 8/22/05) Water quality report 2 times per year (Item 1.D.3 of Draft Operational Guidelines, approved by MROC on 8/22/05)

Item	Committee Specification
	Report amount stored annually or as Committee requests, but no more than 3 times per year (Item 1.E.1 of Draft Operational Guidelines, approved by MROC on 8/22/05)
Monitoring and reporting costs	Monitoring costs will be carried by proponent (Item 1.F of Draft Operational Guidelines and Item 2.F of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, approved by MROC on 8/22/05)
Project operations	MID responsible for Project operations and/or maintenance pertaining to purchases, sales or storage of water (Item 2.D of Draft Operational Guidelines and Item 3.D of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, approved by MROC on 8/22/05)
MOCP changes	Changes to MOCP will require an affirmative vote of at least 8 members (Item 2.B of Draft Operational Guidelines and Item 3.B of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, approved by MROC on 8/22/05)
Conflict of interest	A Committee member shall not participate or vote on any matter before the committee in which that member has a direct or indirect financial interest (Item 2.E of Draft Operational Guidelines, approved by MROC on 8/22/05)
Damages	A determination of liability or of remedy will require an affirmative vote of at least 6 members (Item 2.F of Draft Operational Guidelines and Item 3.F of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, approved by MROC on 8/22/05)
Connection of Project to Mendota Pool	Approval to connect the groundwater supply to or from the MID Water Supply Enhancement Project at Madera Ranch to the Mendota Pool shall require a 9-0 vote (Item 1.A of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, edited and passed by MROC on 8/22/05)
Delivery of groundwater outside of Madera County	Approval to extract groundwater stored at Madera Ranch for the purpose of delivery outside of Madera County as part of the MID Water Supply Enhancement Project shall require a 10-0 vote (Item 1.B of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, edited and passed by MROC on 8/22/05 and amended by MROC on 4/17/06)
Project expansion	Approval to expand the MID Water Supply Enhancement Project shall require a minimum of 8 affirmative votes of Committee members in agreement of the expansion (Item 1.C of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, approved by MROC on 8/22/05)
Development of land that has never been farmed	Approval to develop Project land that has never been farmed shall require a minimum of 6 positive votes of Committee members in agreement. "Develop" is defined as follows: MID changing the characteristics of those portions of the Project land that have never been farmed to agricultural or other use besides cattle grazing. "Other use" does not include MID using such land for any purpose associated with its Water Supply Enhancement Project, such as construction of canals, installation of pipelines or wells, or use for spreading or percolation basins. Further, "other use" does not include restricting the land for conservation purposes." (approved by MROC on 10/24/05)
	Map of "never farmed lands" to be included in the MOU (Item 2.G of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, approved by MROC on 8/22/05)
	The baseline must be established at the current (2005) acres of irrigated farm ground before any unfarmed ground may be converted to other uses (approved by MROC on 8/22/05)
Dispute resolution	As per Semitropic MOU D#8 (Item 3. G of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, approved by MROC on 7/11/05)

1.2.2 MOCP Elements

Taking into account the requirements listed in Table 2, this MOCP has been organized to include the following elements

- Groundwater level monitoring;
- Groundwater and Surface Water Quality Monitoring;
- Flow Rate Monitoring and Water Accounting;
- Surrounding Land Use and Well Status Monitoring;
- Meteorological Monitoring;
- Subsidence Monitoring;
- Reporting;
- Data Evaluation, Operational Constraints and Mitigation; and
- Funding of Activities and Mitigation shall be by MID.

This MOCP specifies overall program requirements, but wherever possible, refers to agency approved standard operating procedures for the details of how data are to be collected and verified.

1.3 MOCP Implementation Roles and Responsibilities

Roles and responsibilities for implementation of the MOCP are summarized in the following table. For the purposes of this MOCP, a 3rd party is defined as any entity other than MID or the MROC. MID obligations may be performed by the District or representatives hired by the district at the discretion of MID.

Table 3: MOCP Implementation Roles and Responsibilities

Item	Responsible Party
Project owner and operator	MID
Implementation of the MCOP	MID
Fund Project operations, MOCP implementation and MROC activities	MID
Data management, reporting and response to 3 rd party information requests	MID
Obtain executed 3 rd party access agreements for monitoring locations that are on land not controlled by MID	MID
Maintain and implement MROC approved changes to the MOCP	MID
Install access ports, valves, taps and other devices on wells as required to enable water level measurements and sampling	MID
First response to complaints	MID
Dispute resolution and potential imposition of remedies on MID if mutually acceptable terms for resolution of a complaint have not been reached within 60 days of MID first receiving the complaint	MROC
Review of MOCP reports and data with recommendations to MID as desired	MROC

1.4 Summary of MROC Voting Requirements

The following table summarizes the MROC voting requirements relating to various Project and MROC activities.

Table 4: MROC Voting Requirements

Action	Voting Requirements
Connection of the Project to Mendota Pool	9 votes in favor
Extraction of groundwater at Madera Ranch for delivery outside of Madera County as part of the Project	10 votes in favor
Expansion of the project	8 votes in favor
Development of Project land that has never been farmed	6 votes in favor
Changes to MOCP	8 votes in favor
Determination that a complaint is not warranted and should be dismissed	6 votes in favor
The MROC may impose an operational constraint or mitigation measure on MID if: <ul style="list-style-type: none">• MID and a 3rd party cannot reach mutually acceptable resolution within 60 days of a complaint or MID finding of unacceptable impact;• MID finding that Project operations may be causing subsidence.	6 votes in favor

1.5 Access and Confidentiality of Information Collected from 3rd Party Properties

Implementation of this MOCP will require monitoring of 3rd party wells by MID. Prior to entering a 3rd party property, MID will obtain written permission from the 3rd party to perform the required monitoring. If a 3rd party does not provide permission for MID to perform the monitoring specified in this MOCP, MID will notify the MROC and the District will be relieved from further responsibilities to perform the specified monitoring on that 3rd party property and the MOCP will be revised accordingly.

MID will use information collected from 3rd party wells to prepare MOCP reports, which will be available for public review. Prior to use of these data in MOCP reports, MID will obtain written permission from the 3rd party to present this information in MOCP reports. If a 3rd party does not provide permission for MID to present collected data in MOCP reports, MID will notify the MROC and the District will be relieved from further responsibilities to perform the specified monitoring on that 3rd party property and the MOCP will be revised accordingly. An exception will be driller logs. All driller logs for 3rd party wells will remain confidential and will not be made available for public review without written permission from the 3rd party.

MID will allow 3rd parties to review and copy information collected from their wells.

As requested, MID will provide MROC representatives with access to Project facilities to perform inspections to the degree that inspections do not impede Project operations, result in damage to Project facilities or cause unsafe conditions.

1.6 Well Naming Conventions

Wells will be identified on forms and in the Project database using the California Department of Water Resources (DWR) State Well Numbering System as detailed below.

The numbering system is based on the public land grid, and includes the township, range, and section in which the well is located. Each section is further subdivided into sixteen 40-acre tracts, which are assigned a letter designation as shown in the figure below. Within each 40-acre tract, wells are numbered sequentially. The final letter of the State Well Number refers to the base line and meridian of the public land grid in which the well lies. "M" refers to the Mount Diablo base line and meridian; "S" refers to the San Benardino base line and meridian; "H" refers to the Humboldt base line and meridian.

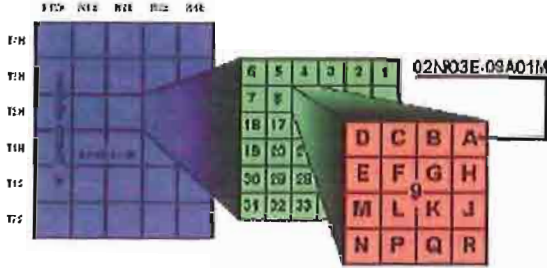


Figure 1: Well Naming Convention Example

In addition, many wells have an "alias" name assigned by the owner or district. Where applicable, these aliases will also be recorded.

1.7 MOCP Revision Procedures

From time to time MID or the MROC may determine that revisions to the MOCP are required. When requested, a Draft Modified MOCP, Draft Errata to the MOCP, or Draft Inserts to the MOCP will be prepared by MID and presented to the MROC according to a timeline agreed to by both parties. The proposed changes can be approved by an affirmative vote of at least 8 members of the MROC.

MID will be responsible for maintaining and revising the master copy of the approved MOCP. MID will provide one copy of the MOCP, errata or inserts to each MROC member each time an approved revision is incorporated.

1.8 MOCP Revision Log

This section is reserved for a list of potential future revisions to the MOCP.

2 MOCP Implementation Schedule

The following table is a compilation of the various monitoring schedule requirements specified in following sections.

Table 5: MOCP Implementation Schedule

Item	When Activity Will Start	Frequency
Water level measurements	Within 90 days of MOCP approval	Weekly to semi-annually
Groundwater quality sampling	First Fall following MOCP approval	Annually in the Fall
Surface (recharge) water quality sampling	First recharge season following MOCP approval	Semi-Annually during recharge years (early and late season)
Recovered surface water quality sampling	First recovery season following MOCP approval	Semi-Annually during recovery years (early and late season)
Flow measurements	First recharge season following MOCP approval	Continuous, daily and weekly
Meteorological measurements	First recharge season following MOCP approval	Hourly to daily
Water accounting calculations	Within 30 days of MOCP approval	Monthly
Subsidence measurements	Prior to first recovery season	Annually
Land use and well status surveys	Within 12 months of MOCP approval	Annually
Water Level Reports	Within 90 days of MOCP approval	Quarterly
Water Quality Reports	First recharge season following MOCP approval	Semi-Annually
Water Accounting Reports	Within 12 months of MOCP approval	Annually
Project Status Reports	Within 12 months of MOCP approval	Triennially (every 3 years)
MID evaluates complaint and presents findings to MROC	Within 14 days of complaint	Within 14 days of complaint
MID responds to complaint and if appropriate, proposes mitigation to complainant	Within 30 days of complaint	Within 30 days of complaint
If complainant and MID are unable to reach acceptable mitigation terms, MROC will arbitrate mitigation and may impose measures on MID	Within 60 days of complaint (requires 6 positive MROC votes)	Within 60 days of complaint (requires 6 positive MROC votes)

3 Water Level Monitoring

As summarized in the Final EIR (September 2005), MID will monitor water levels in wells and will adjust recharge operations to prevent groundwater levels from rising to within 30 feet of the ground surface at the property boundary of the ranch as a consequence of Project operations. During recovery operations, MID will monitor water levels in wells and will adjust operations to prevent unacceptable water level declines in 3rd party wells as a consequence of Project operations relative to conditions that would have occurred absent the Project. This section specifies the frequencies, locations and procedures at which water levels will be measured.

3.1 Objectives

The objectives of water level monitoring program are as follows:

- Provide information regarding background groundwater level variations that are occurring independent of Project operations;
- Provide information regarding groundwater level variations that are occurring because of Project operations; and
- Document the locations and stages of surface water at Madera Ranch.

3.2 Responsibilities

MID is responsible for implementation of the groundwater level monitoring program with the following specific responsibilities:

- Obtaining 3rd party permission to access their wells and report data;
- Installing and maintaining wells on Madera Ranch;
- Procuring and maintaining water level measurement devices;
- Measurement of groundwater levels;
- Compilation of groundwater levels measured by the Bureau of Reclamation (Reclamation) within the area of the MOCP monitoring program;
- Quality assurance/quality control (QAQC) of water level measurements; and
- Entry of water level measurements into an electronic database.

3.3 Monitoring Locations and Frequencies

Water levels will be measured on a weekly, monthly and semi-annual basis as detailed on Table 6 and Depicted on Figure 2.

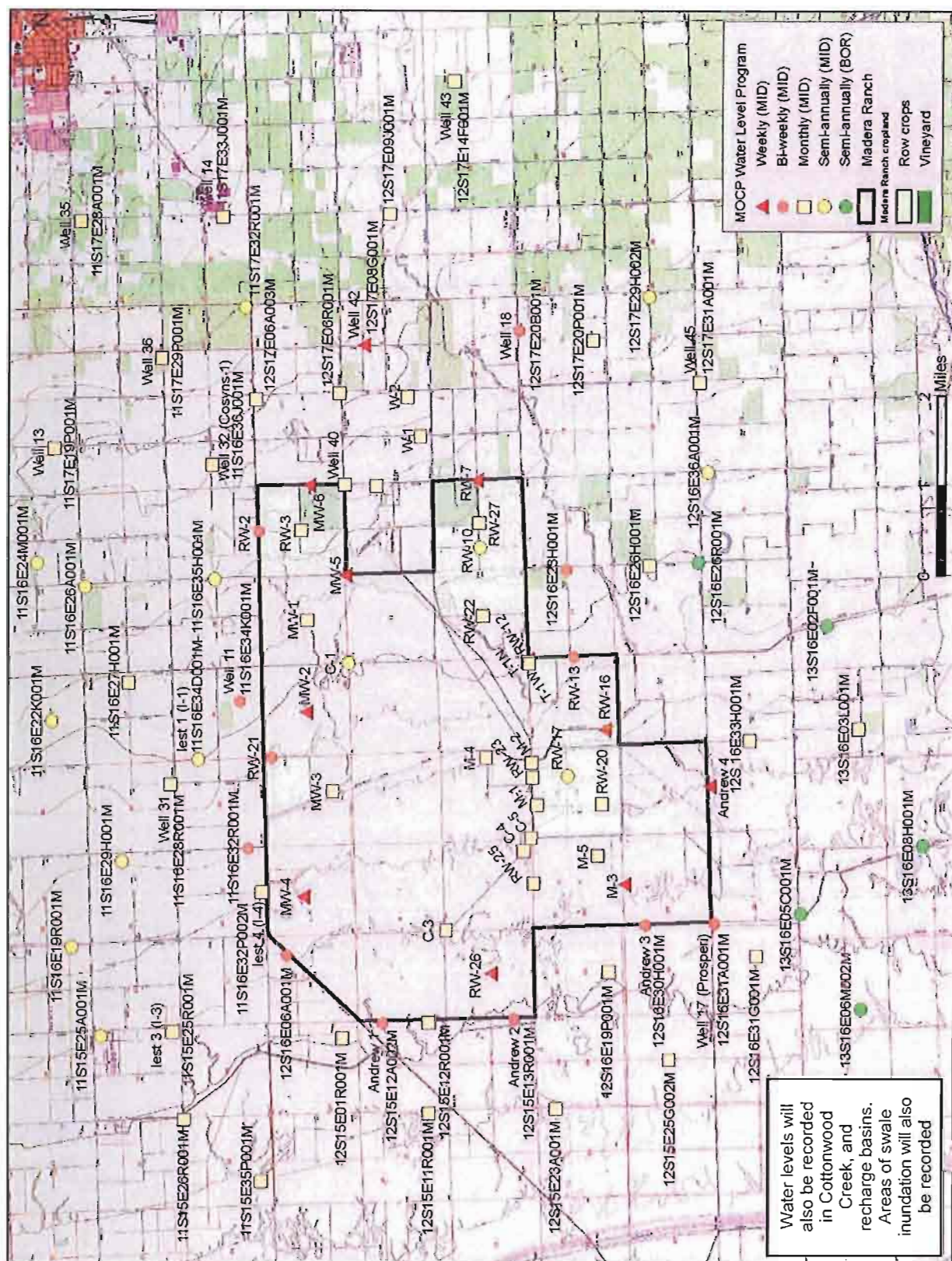


Figure 2: Water Level Monitoring Network

Table 6: Water Level Monitoring Program

Well Number	Well Alias	Frequency and Agency
12S16E01J002M	MW-6	52MID
12S16E02R001M	MW-5	52MID
12S16E03F001M	MW-2	52MID
12S16E05F001M	MW-4	52MID
12S16E13H001M	RW-7	52MID
12S16E18G001M	RW-26	52MID
12S16E22A001M	RW-12	52MID
12S16E22N001M	RW-16	52MID
12S16E28Q001M	Andrew 4	52MID
12S16E29C001M	M-3	52MID
12S17E08G002M	Well 42	52MID
11S16E32R001M		26MID
11S16E34K001M	Well 11	26MID
12S15E12A002M	Andrew 1	26MID
12S15E13R001M	Andrew 2	26MID
12S16E01B001M	RW-2	26MID
12S16E04A002M	RW-21	26MID
12S16E06A001M		26MID
12S16E22J001M	RW-13	26MID
12S16E23H001M		26MID
12S16E30H001M	Andrew 3	26MID
12S16E31A001M	Well 17 (Prosperi)	26MID
12S17E20B001M	Well 18	26MID
11S15E25R001M	lest 3 (I-3)	12MID
11S15E26R001M		12MID
11S15E35P001M		12MID
11S16E27H001M		12MID
11S16E28R001M	Well 31	12MID
11S16E32P002M	lest 4 (I-4)	12MID
11S16E36J001M	Well 32 (Cosyns 1)	12MID
11S17E19P001M	Well 13	12MID
11S17E28A001M	Well 35	12MID
11S17E29P001M	Well 36	12MID
11S17E33J001M	Well 14	12MID
12S15E01R001M		12MID
12S15E11R001M		12MID
12S15E12R001M		12MID
12S15E23A001M		12MID
12S15E25G002M		12MID
12S16E01G001M	RW-3	12MID
12S16E02L001M	MW-1	12MID
12S16E04K001M	MW-3	12MID
12S16E07R001M	C-3	12MID
12S16E12A001M	Well 40	12MID
12S16E12H001M		12MID
12S16E13G002M	RW-27	12MID
12S16E14F001M	RW-22	12MID
12S16E16J001M	M-4	12MID
12S16E17P001M	RW-25	12MID
12S16E17R001M	RW-24	12MID

Well Number	Well Alias	Frequency and Agency
12S16E17R002M	C-4	12MID
12S16E19P001M		12MID
12S16E20K001M	M-5	12MID
12S16E21A001M	M-2	12MID
12S16E21B001M	RW-23	12MID
12S16E21C002M	M-1 (87')	12MID
12S16E21C003M	M-1 (131')	12MID
12S16E21C004M	M-1 (189')	12MID
12S16E21N001M	RW-20	12MID
12S16E22B001M	T-1N	12MID
12S16E22B002M	T-1W	12MID
12S16E26H001M		12MID
12S16E31G001M		12MID
12S16E33H001M	DeSilva 1	12MID
12S17E06A003M		12MID
12S17E06R001M		12MID
12S17E07P001M	W-1	12MID
12S17E07R001M	W-2	12MID
12S17E09J001M		12MID
12S17E14F001M	Well 43	12MID
12S17E20P001M		12MID
12S17E31A001M	Well 45	12MID
13S16E03L001M		12MID
11S15E25A001M		2MID
11S16E19R001M		2MID
11S16E22K001M		2MID
11S16E24M001M		2MID
11S16E26A001M		2MID
11S16E29H001M		2MID
11S16E34D001M		2MID
11S16E35H001M		2MID
11S17E32R001M		2MID
12S16E02N001M	C-1	2MID
12S16E13E001M	RW-10	2MID
12S16E21K001M	RW-17	2MID
12S16E36A001M		2MID
12S17E29H002M		2MID
12S16E26R001M		2BOR
13S16E02F001M		2BOR
13S16E05C001M		2BOR
13S16E06M002M		2BOR
13S16E08H001M		2BOR
Surface Water Locations		
Cottonwood Creek where it leaves Madera Ranch		Continuous, MID
Recharge basins		52, MID
Mapping of the wetted extent of recharge swales		12, MID

Continuous, MID: continuous recorder operated by MID

52MID: weekly by MID

26MID: bi-weekly by MID

12MID: monthly by MID

2MID: semi-annual by MID

2BOR: semi-annual by Bureau of Reclamation

3.4 Baseline Well Documentation and Inspection

As part of the previously described access agreement process with each well owner, MID will request permission to obtain copies of driller logs, pump tests and any other construction and operational information that might be available for each well. MID will perform a baseline inspection of each well within 6 months of access approval, recording the following information:

- Date and time;
- Inspection technician;
- Well owner;
- State Well Number and alias if applicable;
- Digital photograph of well and water level measurement point;
- Assessor parcel number (APN) for the parcel on which the well is located;
- Operating status (operable, inoperable, abandoned etc.);
- Well use (irrigation, domestic, combined);
- Pump type (vertical turbine, jet pump, submersible etc.), make and horsepower (if applicable);
- Motor type (diesel, electric) and horsepower;
- Power meter number (if any);
- Discharge pipe type and diameter;
- Oil feed (Y/N);
- Fertilizer feed (Y/N);
- Tank (Y/N) and estimated capacity;
- Tap or other access for sampling (Y/N) and description;
- Description of the water level measurement point;
- The distance from the water level measurement point to the ground surface;
- Description of surrounding land uses;
- Well pad dimensions, material and condition;
- Descriptions of any potential indications of potential sources of contamination (soil staining, fuel or oil leaks, trash piles etc.); and
- Attempt total depth measurement of the well, to the degree it can be attempted without risking a hang-up of the measuring tape on the pump string.

In some instances the existing well header will not include a port for water level measurement. In these instances, MID will have an access port installed in a manner which is acceptable to the owner within 6 months of access approval. Also within 6 months of access approval, MID will survey the location and elevation of the water level measurement point on each well. Elevation and location measurements will be made under the supervision of a professional engineer or land surveyor licensed to practice in California.

Potential changes to well production capacity as a consequence of Project operations is a specific concern for adjacent landowners. Therefore, well performance will be documented as follows:

1. If the well owner provides the results of pump tests that were performed on a well in its current configuration within the last 5 years; and those tests included measurement of both

- flow rate and changes in water level (drawdown) during pumpage, these results will be considered adequate documentation of baseline well performance; and
2. If adequate existing pump test data are not available for a well; within 1 year of access approval, MID will have the flow rate and drawdown measured during normal operational pumpage.

3.5 Monitoring Procedures

Water levels will be measured in accordance with applicable procedures specified in the following guidance document:

Nye County Nevada, Nuclear Waste Repository Project Office Technical Procedure TP-9.9, "Measurement of Groundwater Levels Using Electric Well Sounders," (most recent revision. This technical procedure may be electronically downloaded from the following Internet site:
<http://www.nyecounty.com/plansprocedures.htm>

Water levels may be measured manually or automatically using data loggers and can be recorded on forms (in pen) or in log books (in pen), but in all cases, the following information will be recorded:

- Location (State Well Number and alias if applicable);
- Date and time (military);
- General description of weather;
- Depth to water (in feet, precise to at least 0.1 feet);
- Measuring device used (with an identification number);
- Technician name;
- ON/OFF condition of the well (if applicable);
- Electric meter or engine hour reading on the well motor (if applicable); and
- Note any significant changes to well condition since last measurement.

In instances where an automatic data logger is used, confirmatory manual measurements (and associated backup information listed above) will be collected at 10% of the manual measurement frequency specified in Table 2. The technicians should record any circumstances which may cause water level measurements to be questionable or could cause water levels to deviate significantly from those previously measured at a location. Some examples of these circumstances include the following:

- Change in the elevation of the point from which the water level is measured;
- Well is on or off or other nearby wells are on or off;
- A new well has been installed nearby;
- Nearby irrigation has started or stopped;
- Nearby irrigation practices or crop types have changed;
- The ground surface around the well indicates subsidence and/or the well pad shows evidence of damage or sinking;
- Water can be heard cascading down the well;
- The well has been re-worked, a new pump installed or the existing pump removed;
- The method of measuring water levels has changed or the specific water level meter used has changed; and
- There is evidence of oil in the well.

The technicians should record any circumstances which prevent them from measuring water level measurements in a well. Some examples of these circumstances include the following:

- The well or access to the well is locked;
- The owner prevents access;
- There is blockage in the well or the tape is hung-up in the well;
- The well is being worked on by others;
- Malfunction of the water level measurement device;
- The well cannot not be found or has been destroyed; and
- The well is dry.

If it becomes apparent that circumstances will permanently prevent measurement of valid water levels in a well, MID will notify the MROC and the District will be relieved from further responsibilities to perform water level measurements in that well and the MOCP will be revised accordingly.

Surface water level measurement locations will be equipped with a staff gage that meets the accuracy and precision requirements specified below.

The wetted extents of recharge swales will be mapped using the coordinate systems specified above and to the accuracies specified below. These accuracies can be accomplished through GPS mapping, by georeferenced aerial photography or by satellite imagery.

3.6 Data Management

MID will develop a standard water level measurement form or log book format which meets the information requirements specified in the previous section. The District will maintain a file where these forms and log books are stored when not in use. If data loggers are used, information will be downloaded at least once a month.

MID will create a separate file for each well in which the baseline well inspection information, pump tests, logs and photographs specified above will be stored for easy reference by MID, the owner and the MROC.

MID will enter water level measurements into an electronic database within 1 month of measurement collection.

3.7 Required Accuracy, Quality Control and Quality Assurance

Water level measurements, elevation measurements and location measurements will meet the following accuracy requirements:

Water level measurement accuracy: at least 0.1 foot, precise to at least 0.05 foot;

Elevation measurement accuracy: at least 3.28 feet (1.0 meter); and

Location measurement accuracy: at least 1.64 feet (0.5 meter).

QA/QC measures will be as follows:

- Field measures: When measuring water levels, technicians will briefly review previous measurements to determine if the recorded water level is reasonably within the previously measured range. If the newest measurement is not reasonably within the previously measured range, the water level will be re-measured. If this deviation from previous measurements is confirmed, this will be noted by the technician on the field form or log book;
- GIS measures: Within 1 month of surveys to measure the elevations and locations of wells, MID will import these data into the Project geographic information system and overlay the measurements on aerial photographs and/or USGS topographic maps to confirm that the measurements plot in the expected locations. If a well does not plot at the expected location and/or within the expected elevation range indicated on the USGS topographic map, MID will re-survey the well location and/or elevation;
- Database measures: Upon entry of a water level into the Project database, MID will review previous measurements to determine if the newly water levels are reasonably within the previously measured range. If a newest measurement is not reasonably within the previously measured range, MID will review measurement technician notes and interview the technician to confirm that the anomalous measurement was made and recorded correctly. If the measurement cannot be confirmed to be correct, the level will be re-measured within 30 days, or during the next water level measurement cycle, whichever is sooner;
- Manual equipment measures: Semi-annually, MID will use a tape measure (accurate to at least 0.01 ft) to confirm that each manual water level meter accurately (+0.05 ft) measures the distance from water to a measuring point at least 5 feet above the water;
- Automatic data logger measures: MID will make confirmatory manual water measurements at 10% of the manual frequency specified in Table 2.

4 Groundwater and Surface Water Quality Monitoring

As summarized in the Final EIR (September 2005), MID will monitor the quality of water entering the ranch for recharge, the quality of water in wells and the quality of recovered water leaving the ranch. This section specifies the frequencies, locations and procedures by which water quality will be measured.

4.1 Objectives

The objectives of the water quality monitoring program are as follows:

- Provide information regarding background groundwater quality variations that are occurring independent of Project operations; and
- Provide information regarding groundwater quality variations that are occurring because of Project operations.

4.2 Responsibilities

MID is responsible for implementation of the water quality monitoring program with the following specific responsibilities:

- Obtaining 3rd party permission to access wells and report data;
- Installing and maintaining wells on Madera Ranch;
- Procuring and maintaining water sampling devices (or retaining sampling contractors);
- Contracting with laboratories that are certified to perform the specified analyses in California; and
- Entry of water quality measurements into an electronic database.

MID's daily, ongoing operations currently include surveillance of conveyance facilities to ensure that accidental spills of hazardous materials that may occur near its facilities are discovered and addressed to prevent contamination of MID's water. This surveillance will continue and extend to the facilities constructed as part of the Project.

4.3 Monitoring Locations, Frequencies and Analytical Suites

Figure 8 and Table 7 present required water quality monitoring locations and frequencies. Table 8 presents required analytical suites. The EIR requires that all active domestic wells within a 1 mile radius of the ranch be included in the MOCP water quality monitoring program. Figure 3 depicts estimated locations of domestic wells within 1 mile of the ranch. The estimated locations were inferred by the presence of a residence (there is no municipal water supply system in this part of Madera County) and State Well Numbers have not yet been assigned to these wells. If during the previously described access agreement process it becomes apparent that some of the estimated domestic wells are not active, do not exist or are at different locations than indicated on Figure 8, MID will notify the MROC and the District will submit a corrected Figure 8 and Table 7.

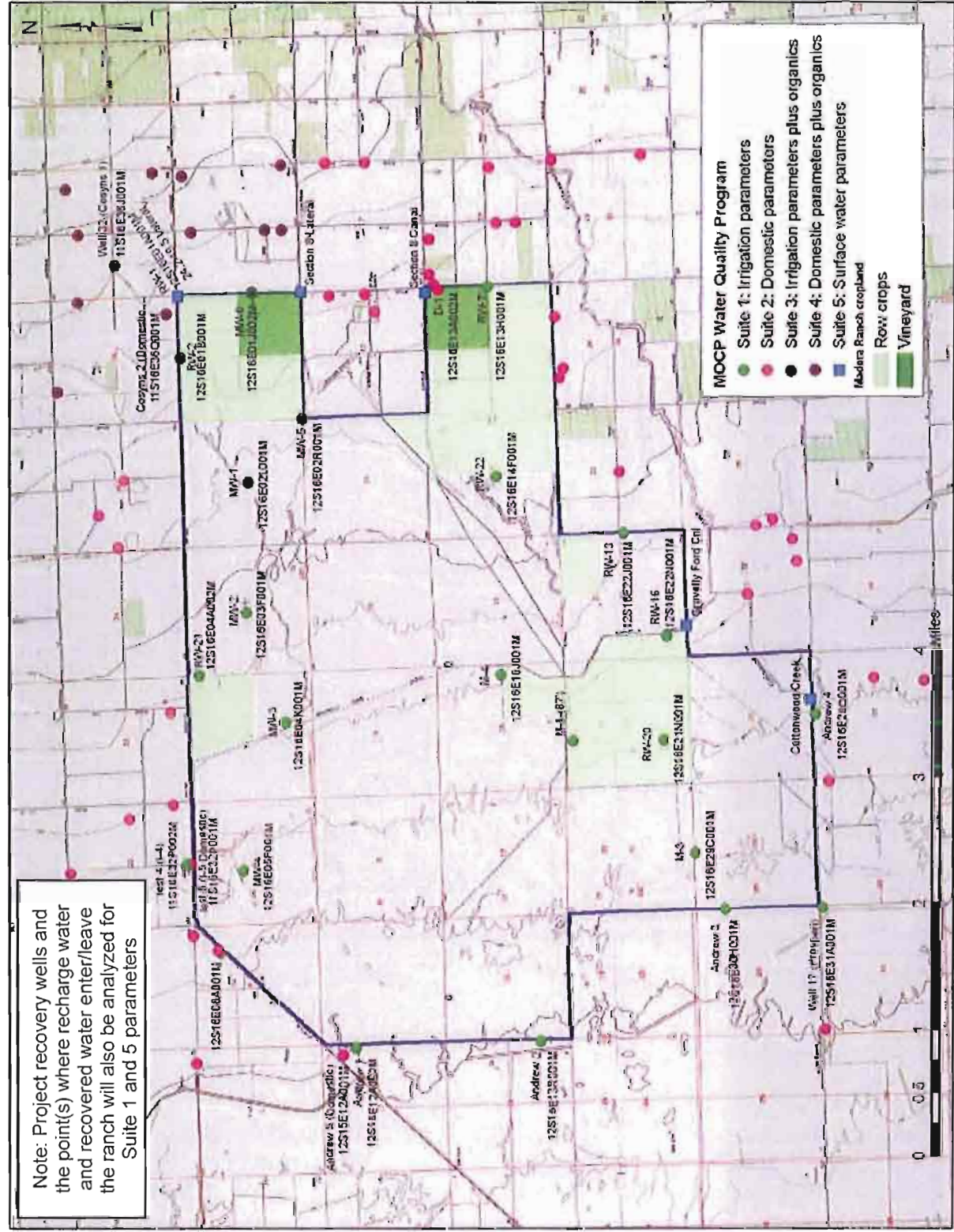


Figure 3: Water Quality Monitoring Network

Table 7: Water Quality Monitoring Program

Well Number	Alias	Well Type	Analytical Suite
Annual Schedule			
11S16E32P002M	Iest 4 (I-4)	Irrigation	1
12S15E12A002M	Andrew 1	Irrigation	1
12S15E13R001M	Andrew 2	Irrigation	1
12S16E04A002M	RW-21	Irrigation	1
12S16E06A001 M		Irrigation	1
12S16E13H001M	RW-7	Irrigation	1
12S16E14F001 M	RW-22	Irrigation	1
12S16E21N001M	RW-20	Irrigation	1
12S16E22J001M	RW-13	Irrigation	1
12S16E22N001M	RW-16	Irrigation	1
12S16E28Q001 M	Andrew 4	Irrigation	1
12S16E30H001M	Andrew 3	Irrigation	1
12S16E31A001M	Well 17 (Prosperi)	Irrigation	1
12S16E03F001M	MW-2	Monitoring	1
12S16E04K001M	MW-3	Monitoring	1
12S16E05F001M	MW-4	Monitoring	1
12S16E16J001M	M-4	Monitoring	1
12S16E21C002M	M-1 (87')	Monitoring	1
12S16E29C001M	M-3	Monitoring	1
Recovery wells (not yet installed)	Not yet specified	Recovery	1
Various	Various	Estimated 36 domestic wells within 1 mile of ranch	2
11S16E32P001M	Iest 5 (I-5 Domestic)	Domestic	2
12S15E12A001 M	Andrew 5 (Domestic)	Domestic	2
12S16E13A002M	D-1	Domestic	2
11 S1 6E36J001 M	Well 32 (Cosyns 1)	Irrigation	3
12S16E01A001M	RW-1	Irrigation	3
12S16E01B001M	RW-2	Irrigation	3
12S16E01J002M	MW-6	Monitoring	3
12S16E02L001M	MW-1	Monitoring	3
12S16E02R001M	MW-5	Monitoring	3
Various	Various	Estimated 10 domestic wells within 1 mile of ranch	4
11S1 6E36Q001 M	Cosyns 2 (Domestic)	Domestic	4
	24.2-19.5 Lateral	Surface water	5
	Section 8 Canal	Surface water	5
	Section 8 Lateral	Surface water	5
	Cottonwood Creek	Surface water	5
	Gravelly Ford Canal	Surface water	5
Semi-Annual Schedule During Project Operations Only			
Recharge water entering ranch	Not yet specified	Surface water	5
Recovered water leaving ranch	Not yet specified	Surface water	5

Table 8: Water Quality Analytical Suites

Suite	Parameter	Analytical Method
1 Irrigation Parameters	Total dissolved solids (TDS)	
	pH (Field)	
	Specific conductance (Field)	
	Turbidity (Field)	
	Temperature (Field)	
2 Domestic Parameters	Fecal coliform	
	Total dissolved solids (TDS)	
	Chloride	
	Nitrate	
	Sulfate	
	pH (Field)	
	Specific conductance (Field)	
	Turbidity (Field)	
3 Irrigation Parameters plus Organics	Temperature (Field)	
	Total dissolved solids (TDS)	
	1,2,3-Trichloropropane	
	pH (Field)	
	Specific conductance (Field)	
	Turbidity (Field)	
4 Domestic Parameters plus Organics	Temperature (Field)	
	Fecal coliform	
	Total dissolved solids (TDS)	
	Chloride	
	Nitrate	
	Sulfate	
	1,2,3-Trichloropropane	
	pH (Field)	
	Specific conductance (Field)	
	Turbidity (Field)	
5 Surface Water Parameters	Temperature (Field)	
	Total dissolved solids (TDS)	
	pH (Field)	
	Specific conductance (Field)	
	Turbidity (Field)	

4.4 Sampling and Analytical Procedures

Water sampling will be performed, field measurements collected and laboratory analyses performed in compliance with applicable procedures specified in the documents:

"National Field Manual for the Collection of Water-Quality Data," Techniques of Water-Resources Investigations Book 9, Handbooks for Water-Resources Investigations, US Geological Survey, available on the Internet at: <http://water.usgs.gov/owq/FieldManual/>

Laboratory analyses will be made in compliance with applicable procedures listed in Table 8.

4.5 Data Management

MID will create a separate file for each monitoring location in which sampling records and analytical data will be stored for easy reference by MID, the owner and the MROC. In addition, MID will maintain a separate file of the original sampling and analytical reports as received from contractors and laboratories.

MID will enter water quality data into an electronic database within 1 month of receipt of validated analytical data from the laboratories.

4.6 Quality Control and Quality Assurance

Laboratory QA/QC will be performed in compliance with the procedures specified in the documented cited above.

Sampling events will include the following QA/QC samples:

- 1 duplicate sample will be collected for every 10 samples of a particular analytical suite; and
- 1 trip blank will be analyzed for each day of sampling for Analytical Suite 3 or 4. These trip blanks will be analyzed for 1,2,3-trichloropropane.

If data are entered into the electronic database manually, MID will perform a visual check of at least 10% of all manually entered data. If a data entry data is found, 100% of the data manually entered on that day will be checked against the original laboratory and sampling reports.

5 Flow Rate Monitoring and Water Accounting

As summarized in the Final EIR (September 2005), MID will monitor the volumes of water entering the ranch for recharge and the volumes of recovered water leaving the ranch. This section specifies the frequencies, locations and procedures by which water flow rates and volumes will be measured.

5.1 Objectives

The objectives of the flow monitoring program will be to document the following:

- The volumes of surface water delivered to Madera Ranch;
- The volumes of water recharged by in-lieu means at Madera Ranch;
- The estimated volumes of evapotranspirative loss of applied water at Madera Ranch;
- The volumes of water directly recharged at Madera Ranch;
- The volumes of water left behind to aid in reduction of aquifer overdraft (10% leave behind); and
- The volumes of water recovered from storage and delivered to MID customers.

5.2 Responsibilities

MID is responsible for implementation of the flow monitoring program with the following specific responsibilities:

- Installing, operating and maintaining flow measuring devices;
- Entry of water quality measurements into an electronic database; and
- Performing required calculations and reporting.

MID's daily, ongoing operations currently include surveillance of conveyance facilities to ensure that accidental water spills and/or theft does not occur or are halted when found. This surveillance will continue and extend to the facilities constructed as part of the Project.

5.3 Monitoring Locations and Frequencies

Flows will be monitored at the locations and frequencies specified on Table 9. Water conveyed through the MID system to Madera Ranch is part of normal MID operations. Monitoring of these off-ranch flows are part of the normal MID operation and are not covered by this MOCP.

Table 9: Flow Monitoring Locations, Frequencies and Accuracies

Location	Frequency	Accuracy	Precision
Incoming Surface Water Flow Monitoring			
All locations where surface water enters Madera Ranch	Continuous recordation of totalizing and instantaneous readings (when operating)	Totalizing: 1 AF Instantaneous: 0.1 cfs	Totalizing: 2%+/- Instantaneous: 2%+/-
All turnouts from canals, pipelines or ditches to Madera Ranch farmland	Daily recordation of totalizing and instantaneous readings (when operating)	Totalizing: 1 AF Instantaneous: 0.1 cfs	Totalizing: 2%+/- Instantaneous: 2%+/-
All turnouts from canals, pipelines or ditches into swales or recharge basins	Daily recordation of totalizing and instantaneous readings (when operating)	Totalizing: 1 AF Instantaneous: 0.1 cfs	Totalizing: 2%+/- Instantaneous: 2%+/-
Recovered Water Flow Monitoring			
All Madera Ranch irrigation wells	Weekly recordation of totalizing and instantaneous readings (when operating)	Totalizing: 1 AF Instantaneous: 0.1 cfs	Totalizing: 2%+/- Instantaneous: 2%+/-
All Project Recovery wells	Weekly recordation of totalizing and instantaneous readings (when operating)	Totalizing: 1 AF Instantaneous: 0.1 cfs	Totalizing: 2%+/- Instantaneous: 2%+/-
All turnouts from canals, pipelines or ditches to Madera Ranch farmland	Daily recordation of totalizing and instantaneous readings (when operating)	Totalizing: 1 AF Instantaneous: 0.1 cfs	Totalizing: 2%+/- Instantaneous: 2%+/-
All locations where recovered water leaves Madera Ranch	Continuous recordation of totalizing and instantaneous readings (when operating)	Totalizing: 1 AF Instantaneous: 0.1 cfs	Totalizing: 2%+/- Instantaneous: 2%+/-

Notes:

1. After recovered water leaves Madera Ranch for delivery to customers, flows and volumes delivered will be monitored in accordance with MID's normal procedures.
2. Evapotranspirative loss monitoring is covered under the Meteorological Monitoring portion of this MOCP
3. AF: acre-feet, cfs: cubic feet per second
4. Other units such as gallons or gallons per minute are acceptable as long as the same accuracies and precisions are provided

5.4 Monitoring Procedures

Volumetric and instantaneous flow measurement devices will be installed, maintained and used in accordance with applicable procedures specified by the manufacturers and following applicable guidelines in the following document:

"The Water Measurement Manual," A Water Resources Technical Publication, US Department of Interior, Bureau of Reclamation, Water Resources Research Laboratory, available on the Internet at: <http://www.usbr.gov/pmts/hydraulicslab/pubs/wmm/>

Flows may be measured manually or automatically using data loggers and can be recorded on forms (in pen) or in log books (in pen), but in all cases, the following information will be recorded:

- Location (turnout number or station name);
- Date and time (military);
- General description of weather;
- Instantaneous flow and cumulative volume;
- Technician name;; and
- Note any significant changes to meter location since last measurement.

The technicians should record any circumstances which may cause flow measurements to be questionable or could cause measured flows to deviate significantly from those previously measured at a location. The technicians should record any circumstances which prevent them from measuring flows.

5.5 Water Accounting Procedures

Table 10 lists the monthly water accounting calculations that will be performed by MID.

Table 10: Monthly Water Accounting Requirements

#	Item	Computation Method
1	Volume of surface water delivered to Madera Ranch	Summation of flows entering Madera Ranch
2	Volume of surface water delivered to Madera Ranch farmland	Summation of flows through turnouts to farmlands
3	Volume of surface water delivered to recharge swales and basins	(Item 1) – (Item 2)
4	Estimated volume of water delivered to recharge swales and basins, but lost to evapotranspiration	See Meteorological Monitoring Procedures
5	Volume of water recharged through direct means	(Item 3) – (Item 4)
6	Volume of water recovered using recovery wells and Madera Ranch irrigation wells	Summation of flows from recovery and irrigation wells
7	Volume of recovered water delivered to Madera ranch farmlands	Summation of flows from irrigation wells discharging to Madera Ranch farmland
8	Volume of recovered water delivered to Madera ranch farmlands and lost to evapotranspiration	See Meteorological Monitoring Procedures
9	Volume of recovered water delivered to Madera ranch farmlands and returned to storage through deep percolation	(Item 8) – (Item 9)
10	Volume of recovered water leaving Madera ranch for delivery to customers	Summation of flows leaving Madera Ranch
11	Volume placed into storage	(Item 5) + (Item 6)
12	Volume removed from storage	(Item 9) + (Item 11)
13	Volume of water in storage	(Σ of Item 12) – (Σ of Item 11)
14	Volume of water contributed to overdraft recovery	0.1 x (Item 14)
15	Volume of recoverable water in storage	(Item 14) – (Item 15)

Notes:

1. All indicated computations will be tabulated for the following time intervals: the previous month, the year to-date, prior years (calendar or water year basis as desired by MID) and Project cumulative to-date.

5.6 Data Management

MID will develop a standard flow measurement form or log book format which meets the information requirements specified in the previous section. The District will maintain a file where these forms and log books are stored when not in use. If data loggers are used, information will be downloaded at least once a month.

MID will create a separate file for each monitoring location in which the records regarding meter types, maintenance and calibration will be stored for easy reference by MID and the MROC.

MID will enter flow measurements into an electronic database within 1 month of measurement collection.

5.7 Required Accuracy, Quality Control and Quality Assurance

Instantaneous and totalizing flow meters will be calibrated at least annually using procedures and tolerances specified by manufacturers. Required flow measurement accuracies are specified in Table 9.

The Project flow monitoring system will include 2 types of redundancy that will be used to perform QA/QC checks as follows:

Incoming volume check: the summation of volumes delivered into recharge basins, recharge swales and fields should be slightly less than the summation of volumes entering the ranch (due to evaporative and seepage losses). During recharge periods these 2 volumetric summations will be compared on a monthly basis. If the resultant sums are more than 15% different, MID will perform an audit of flow meters and measurements to determine if any devices are malfunctioning or if records have been incorrectly entered.

Recovered volume check: the summation of volumes recovered from wells should be slightly higher than the summation of recovered water delivered to fields and leaving the ranch (due to evaporative and seepage losses). During recharge periods these 2 volumetric summations will be compared on a monthly basis. If the resultant sums are more than 15% different, MID will perform an audit of flow meters and measurements to determine if any devices are malfunctioning or if records have been incorrectly entered.

6 Surrounding Land Use and Well Status Monitoring

This MOCP is intended to ensure that surrounding landowners are protected from unacceptable impacts caused by the Project. In order to ensure that impact evaluations remain objective and well informed, the status of surrounding land uses and wells will be periodically documented by MID so that changes unrelated to Project operations can be considered during impact evaluations.

6.1 Objective

The objective of the land use and well status monitoring program will be to document changes that might impact water levels and quality in wells within 1 mile of Madera Ranch.

6.2 Responsibilities

MID is responsible for implementation of the land and well status monitoring program with the following specific responsibilities:

- Obtaining 3rd party permission to access their lands/wells and report data;
- Performance of periodic inspections; and
- Maintenance of Project files.

6.3 Monitoring Locations, Frequencies and Procedures

As detailed in previous sections, the water level and quality monitoring programs will entail MID technicians entering 3rd party lands, inspecting wells and collecting water levels at various times. As specified in previous sections, MID technicians are required to document changes to conditions of wells and surrounding land uses. These records will be augmented by the following supplemental work. On an annual basis, MID will:

- Send a questionnaire to each property owner within 1-mile of Madera Ranch asking the following questions (at a minimum):
 - Have you installed any new wells in the last year? If so, what are their uses?
 - Have you taken any wells out of service in the last year? If so, what were their uses?
 - If you have new wells, would you be willing to allow MID to measure water levels and/or collect water quality samples?
- Request from the Madera County Department of Environmental Health a listing of all well permits issued by Madera County for the area within 1-mile of Madera Ranch;
- If the questionnaires or well permit logs specified above indicate that a new domestic well has been installed within 1 mile of the ranch, MID will be required to request permission to include that well in the monitoring program. If approval is granted and an access agreement obtained (if one is not already in place), this well will be added to the water quality monitoring program.
- MID will review aerial photographs and/or perform drive-through surveys of the area within a 1-mile radius of the ranch to document changes in land use that might significantly impact groundwater levels or quality in the vicinity. The land use change survey will be documented by marking observations on a map or aerial photograph. Examples of land-use changes that should be documented include (but are not limited to):
 - Conversion of farmland from permanent crops to row crops or the reverse;
 - Construction of new houses or development of other non-agricultural land uses;

- New well locations;
- Fallowing of land; and
- Installation, extension, re-activation or abandonment of canals or ditches.

6.4 Data Management

The District will maintain a file where questionnaire records, County well permit records and land use change maps are stored for easy reference by MID and the MROC.

7 Meteorological Monitoring

As detailed in previous sections, MID is required to estimate evapotranspirative losses of water delivered to Madera Ranch for direct recharge purposes. This meteorological monitoring program specifies how data will be collected and used to estimate evapotranspirative losses.

7.1 Objective

The objective of the meteorological monitoring program is to collect adequate information to enable estimation of evapotranspirative losses of water on Madera Ranch at an accuracy that is adequate for the purpose of the water balance calculations specified in previous sections.

7.2 Responsibilities

MID is responsible implementation of the meteorological monitoring program, including collection of data from 3rd party operated monitoring stations.

7.3 Monitoring Locations and Frequencies

Table 11 specifies the parameters and measurements that will be made by MID and obtained by MID as part of the meteorological monitoring program.

Table 11: Meteorological Monitoring Program Locations, Parameters and Frequencies

Monitoring Location	Parameters	Frequency
Near the center of Madera Ranch (to be installed) Measurements by MID	Maximum air temperature	Daily
	Minimum air temperature	
	Dry-bulb temperature	Daily
	Wet-bulb temperature	
	Dew point	Daily
	Precipitation	Daily (indicate snow or rain)
MID Headquarters (existing station) Measurements by MID	24 hour wind movement	Daily
	Pan A evaporation	Daily
	Maximum air temperature	Daily
	Minimum air temperature	
	Dry-bulb temperature	Daily
	Wet-bulb temperature	
CIMIS Station 145 6.7 miles north of Madera Ranch at Ave 18 ½ and Rd 19 ½ Measurements by DWR	Dew point	Daily
	Precipitation	Daily (indicate snow or rain)
	24 hour wind movement	Daily
	Pan A evaporation	Daily
	Irrigated pasture reference crop evapotranspiration	Hourly and daily
	Precipitation	
	Solar radiation	
	Net radiation	
	Maximum, minimum, average soil temperature	
	Maximum, minimum, average air temperature	
	Maximum, minimum, average vapor pressure	
	Wind cubed, wind speed, wind direction, wind run	
	Pan A evaporation	
	Maximum, average, minimum relative humidity	
	Penman-Monteith ETo and ETr	
	Dew point	

Notes:

1) MID is not responsible for the continued operation of or the accuracy of data from CIMIS Station 145. If this station goes off-line, an alternate source of the listed data will be determined at that time.

7.4 Monitoring Procedures

MID meteorological instrumentation will be installed, maintained and operated in compliance with applicable procedures specified by the manufacturers.

7.5 Data Management

Data collected by MID will be recorded either manually on DWR forms already used by MID for recordation of data from the existing MID headquarters weather station or in an electronic format which incorporates the same information that is included on the DWR forms. The District will maintain a file where forms are stored when not in use.

7.6 Estimation of Evapotranspiration

Some of the water applied to swales or ponds for recharge will be lost to open water evaporation and evapotranspiration by plants along the fringe of water. These losses will be computed at least once a month as follows:

- 1) The average lateral extent of inundation will be mapped, with 2 categories of wetting noted as follows:
 - Areas of complete inundation with no vegetation emerging from the water; and
 - Areas of partial inundation with vegetation.
- 2) The gross water application rate (feet/day) will be computed as:

$$\text{Gross application rate} = (\text{Average flow rate} + \text{precipitation}) / \text{Area of inundation}$$

- 3) Open water evaporation rate (feet/day) will be estimated by multiplying the average ranch Pan A data by a free water pan coefficient of 0.72 (National Weather Service/NOAA Evaporation Atlas for the Contiguous United States, June 1982). Open water evaporation loss (acre-feet) will be estimated by multiplying the open water evaporation rate by the acreage of open water and the number of days considered.
- 4) Evapotranspirative (ET) losses will be broken into 2 components as follows:
 - ET by grasses within areas of partial inundation; and
 - ET by grasses thriving along the edge of ponded water.
- 5) It will be conservatively assumed that 100% of the ET requirement of fringe and partial inundation grasses is provided by the applied water (ie, rainfall and soil moisture storage are not assumed to reduce ET of applied water, ETAW). Daily reference ET (ET_o) will be obtained from CIMIS Station 145 – which uses irrigated pasture as the reference crop – an almost identical condition to that in the Madera Ranch recharge swales, therefore a crop coefficient of 1.0 will be used (approach validated through CUP-E software, DWR 2004).
- 6) ET (feet/day) will be multiplied by the number of days considered, the acreages of partial inundation and vegetation fringe surrounding the application areas to provide the amount of water that was lost to grass ET (acre-feet).
- 7) Recharges volumes (acre-feet) will be computed as follows:

$$\text{Recharged volume} = (\text{Gross application rate} - \text{Evaporation} - ET_{\text{fringe}} - ET_{\text{partial inundation}}) \times \text{Days}$$

8 Subsidence Monitoring

Land subsidence is the lowering or sinking of the ground surface due to any of several processes. Historically, subsidence has occurred to the west of the Madera Ranch as a result of groundwater pumpage which caused compaction of aquifer materials. However, ground elevation monitoring conducted by the U.S. Geological Survey (USGS) has indicated that no more than one foot of subsidence has occurred on Madera Ranch even though the area of Madera Ranch has been subjected to over 100 years of intense groundwater pumpage. Therefore, it is unlikely that subsidence will be a factor in Project operations. Nonetheless, MID has committed to performing elevation monitoring of multiple locations on Madera Ranch before and during Project operation (EIR, pp. 2-25). This section specifies how the elevations of on-site markers will be measured on an annual basis and compared to distant benchmarks to allow detection of change in ground elevations.

8.1 Objective

The objective of subsidence monitoring is to measure ground surface elevations at sufficient locations, frequencies and precision to provide early indications of elevation changes that might be due to Project pumpage.

8.2 Responsibilities

MID will implement the subsidence monitoring program with the following specific responsibilities:

- Preparation of a detailed subsidence monitoring plan under the supervision of a professional engineer or land surveyor licensed to practice in California;
- Installation and maintenance of subsidence bench marks;
- Performance of annual subsidence surveys under the supervision of a professional engineer or land surveyor licensed to practice in California; and
- Compilation, QA/QC and reporting of subsidence survey data.

8.3 Monitoring Locations and Frequencies

Land subsidence is measured by comparing sequential measurements of land surface elevation at a location. This comparison is predicated on the assumption that the reference bench mark for computation of elevation is outside of the area within which subsidence (or other elevation changes) will potentially occur. Therefore, each subsidence monitoring event must be tied to at least one of the following: a vertically stable geodetic station in the regional network; a geodetic station in the regional network for which current coordinates are available; or a Continuously Operating Reference Station (CORS) in the NGS network. CORS are permanent, continuously tracking GPS sites whose coordinates are computed nearly daily and are available via the Internet. MID subsidence monitoring will include the following elements:

Base Station: Reference of all elevation measurements to a base station at least 1 mile away from the Madera Ranch property line;

Perimeter Benchmarks: Placement of permanent bench-marks at least every 2 miles along the Madera Ranch property line (approximately 12 benchmarks);

Recovery Well Benchmarks: Placement of permanent measurement points on each Project recovery well;

Baseline Measurements: Measurement of the elevations and x,y-coordinates of each perimeter benchmark at least 1-year prior to commencement of banked water recovery operations and of each recovery well benchmark following development but prior to commencing operation of the well;

Annual Measurements: Measurement of the elevations of each perimeter benchmark and recovery well bench mark at least annually.

8.4 Monitoring Procedures

Benchmarks will be constructed and installed using procedures approved by the California Board for Professional Engineers and Land Surveyors and using appropriate guidelines promulgated by the National Geodetic Survey and the California Spatial Reference Center. Subsidence monitoring can be performed using traditional leveling surveys, high precision GPS surveys and remote sensing radar techniques. Any of these methods may be used by MID as long as precision and accuracy requirements specified below are achieved. Survey work and calculations will be performed by a surveyor licensed to perform this work and in good standing with the California Board for Professional Engineers and Land Surveyors.

8.5 Data Management

Field measurements will be documented log books and electronically in accordance with procedures specified by the previously cited organizations. The District will maintain a file where log books are stored when not in use. A back-up photocopy of each new log book entry and all electronic records will be made within 1 month of data collection and the backup copies will be stored at a separate location at MID.

MID will enter elevation measurements into an electronic database within 1 month of measurement collection.

8.6 Required Accuracy, Quality Control and Quality Assurance

Subsidence monitoring will be performed within the following precision and accuracy specifications:

Elevation: measurements will be referenced to the geodetic vertical datum used by Reclamation in Madera County and accurate to at least 0.066 ft (2 cm). Measurements will be reported to a precision of at least 0.01 ft (0.3 cm).

X,Y coordinates: each benchmark used within the subsidence survey will be referenced to the geodetic datum used by Reclamation in Madera County, accurate to at least 3.28 feet (1 meter).

Elevation and location measurements will be made under the supervision of and certified by a professional engineer or land surveyor licensed to practice in California.

9 Reporting

This section specifies reporting requirements. As detailed in Table 1, the MROC requires the following reports:

- Report all groundwater levels a minimum of 4 times per year or as the Committee Chair requests (Item 1 .A of Draft Operational Guidelines, approved by MROC on 8/22/05);
- Water quality report 2 times per year (Item 1 .D.3 of Draft Operational Guidelines, approved by MROC on 8/22/05);
- Report amount stored annually or as Committee requests, but no more than 3 times per year (Item 1 .E.1 of Draft Operational Guidelines, approved by MROC on 8/22/05); and
- Triennial Monitoring Report (every 3 years) providing executive summary of ranch status (Item 2.H of June-July-August 2005 Principles, Monitoring, Reporting, Responsibilities, edited and approved by MROC on 8/22/05).

9.1 Responsibilities

MID is responsible for preparing and submitting all required reports to the MROC. To the degree that MID relies on information from 3rd parties to prepare a report and the 3rd party does not make the required information available, MID will make note of this in the impacted report and will not be held responsible for the missing information.

9.2 Quarterly Water Level Reports

MID will prepare and submit quarterly water level reports to the MROC according to the following schedule:

- 1st Quarter Report (January through March): by May 15th
- 2nd Quarter Report (April through June): by August 15th
- 3rd Quarter Report (July through September): by November 15th
- 4th Quarter Report (October through December): by February 15th

At a minimum, each report will include the following:

- A map depicting the locations at which water level measurements have been made;
- A tabulation of all water level measurements from all MOCP program wells since 1985;
- A hydrograph for each MOCP program well (both elevation and depth to water) since 1985;
- A listing of all wells (if any) in which water levels were within 30 feet of the ground surface;
- A listing of all operable irrigation wells in which water levels fell to the level of the pump intake (i.e. the well began to draw air);
- A listing of all wells (if any) for which the owner complained of failure, reduced productivity or other perceived water level impact;
- A listing of all wells in which water levels might rise to within 30 feet of the ground surface within 3 years based on extrapolation of water level measurements. The appropriate

- extrapolation method is to be determined by MID although a published, peer reviewed 3rd party reference must be used as the basis for the chosen extrapolation method;
- A listing of all operable irrigation wells in which water levels might fall to the level of the pump intake within 3 years based on extrapolation of water level measurements. The appropriate extrapolation method is to be determined by MID although a published, peer reviewed 3rd party reference must be used as the basis for the chosen extrapolation method;
 - A graph for each well depicting the 3 year moving average rate of water level rise/decline (feet/year). The appropriate averaging method is to be determined by MID although a published, peer reviewed 3rd party reference must be used as the basis for the chosen averaging method;
 - A listing of all wells in which the 3 year moving average rate of water level decline during the most recent reporting period was more than that at any point in the baseline period from 1985-2005 (as reported in the document, "*Baseline Groundwater Level Report*," January 2006). For wells with insufficient baseline data, the baseline average for all wells within a 1-mile radius of the subject well may be used in this determination;
 - A listing of all wells within which the 3 year moving average rate of water level decline is greater than 5 feet per year;
 - A water level contour map (referenced to the geodetic vertical datum used by Reclamation) with the following identified features:
 - The Madera Ranch boundary;
 - Major roads;
 - MOCP program wells;
 - The average water level elevation in each MOCP program well during the quarter being reported;
 - Contour lines based on the average water level elevations;
 - Locations at which recharge was performed on Madera Ranch during the quarter being reported; and
 - Recovery wells that were used during the quarter being reported.
 - A depth to water contour map with the following identified features:
 - The Madera Ranch boundary;
 - Major roads;
 - All MOCP program wells;
 - The average depth to water from ground surface in each MOCP program well during the quarter being reported;
 - Contour lines based on the average depth to water;
 - Locations at which recharge was performed on Madera Ranch during the quarter being reported;
 - Recovery wells that were used during the quarter being reported;
 - A listing of MOCP program wells at which required measurements were not made during the last quarter (if any), the reasons for these omissions and plans to rectify the problem(s) or remove the well(s) from the program; and
 - Summary of results of statistical analyses regarding potential impacts to 3rd party wells.

9.3 Semi-Annual Water Quality Reports

MID will prepare and submit semi-annual water quality reports to the MROC according to the following schedule:

- 1st Semi-Annual Report (January through June): by August 15th

- 2nd Semi-Annual Report (July through December): by February 15th

At a minimum, each report will include the following:

- A map depicting the locations at which samples were collected;
- A tabulation of all water quality measurements from all MOCP program locations since monitoring began at each location;
- A listing of all wells (if any) for which owners complained of quality, odor or taste problems;
- A graph of TDS concentrations versus time at each monitoring location, including a plot of the 3 year moving average TDS concentration;
- A listing of all wells in which TDS concentrations might rise above 500 mg/l within 3 years based on extrapolation of measurements (if any);
- A listing of all wells in which the following parameters were detected at concentrations above the indicated thresholds:
 - TDS (California Department of Health Services Secondary Maximum Contaminant Level, currently 500 mg/l)
 - Fecal coliform (any detection)
 - Chloride (California Department of Health Services Secondary Maximum Contaminant Level, currently 250 mg/l)
 - Nitrate (California Department of Health Services Maximum Contaminant Level, currently 45 mg/l)
 - Sulfate (California Department of Health Services Secondary Maximum Contaminant Level, currently 250 mg/l)
 - 1,2,3-Trichloropropane (all detections)
- A listing of MOCP program wells at which required samples were not collected during the last quarter (if any), the reasons for these omissions and plans to rectify the problem(s) or remove the location(s) from the program; and
- Results of statistical analyses regarding potential impacts to 3rd party wells.

Water quality reports are not required to include field data sheets or laboratory reports. However, copies of these back-up documents must be maintained at MID and made available for MROC members and well owners to review upon request.

In addition to the report specified above, each 3rd party well owner will be provided with a letter report presenting results from the most recent sampling event according to the same schedule as the semi-annual water quality reports.

9.4 Annual Water Accounting Reports

MID will prepare and submit water accounting reports to the MROC annually by March 1st of each year for the preceding year. At a minimum, each water accounting report will include tabulations of the following (both for the preceding year and cumulative since January 1, 2005):

- The volumes of surface water delivered to Madera Ranch;
- The volumes of evapotranspirative loss of water applied to direct recharge areas at Madera Ranch;
- The volumes of water directly recharged at Madera Ranch;
- The volumes of water left behind to aid in reduction of aquifer overdraft (10% leave

- behind); and
- The volumes of water recovered from storage and delivered to MID customers.

9.5 Triennial Status Reports

MID will prepare and submit Project status reports to the MROC every three years with the first report due on March 1, 2009 and with subsequent reports by the same date every 3rd year thereafter. At a minimum, the reports will include the following:

- A summary of regulatory compliance;
- A summary of Project build-out and operational status;
- A summary of Project impacts to groundwater levels;
- A summary of Project impacts to groundwater quality;
- A summary of water accounting;
- A summary of subsidence monitoring results;
- A listing of complaints against the Project by adjacent landowners (if any) and the status of complaint resolution; and
- A summary of trends or issues of concern regarding water levels, water quality and/or subsidence and MID's approach to resolving these issues or concerns.

9.6 Reporting Formats and Availability

MID will deliver 1 copy of each required report to each MROC member by the dates specified above. The required reports will be large and in hard copy would require significant storage space. Therefore, MID can choose to deliver all reports to MROC members in an electronic format (e.g. Adobe PDF format) as long as at least one hard copy of each report is maintained for review at MID. As requested, MID will make available up to three additional electronic copies of each report available to MROC members.

As specified above, each 3rd party well owner will be provided with letter reports presenting results from water quality sampling events.

9.7 3rd Party Information Requests

From time-to-time 3rd parties may request copies of reports and/or monitoring data. MID will make the documents available for review at MID, with the exception of water quality reports sent to individual well owners. These later reports will be considered confidential unless a written release is received from the well owner by MID.

Data Evaluation, Operational Constraints and Mitigation

This section specifies evaluation procedures and operational protocols that will be used by MID to minimize and/or mitigate unacceptable impacts to 3rd parties as a result of Project operations.

9.8 Responsibilities

MID is responsible for compiling/evaluating data and corresponding with 3rd parties to:

- Make reasonable efforts to estimate if unacceptable impacts to 3rd parties may occur in the future as a result of Project operations relative to conditions that would have occurred absent the Project;
- Adjust Project operations to minimize unacceptable impacts to 3rd parties relative to conditions that would have occurred absent the Project;
- Respond to reasonable complaints of unacceptable impacts as a result of Project operations relative to conditions that would have occurred absent the Project;
- Determine if unacceptable impacts to 3rd parties have occurred as a result of Project operations relative to conditions that would have occurred absent the Project; and
- Adjust Project operations to prevent further unacceptable impacts to 3rd parties and/or mitigate unacceptable impacts to 3rd parties relative to conditions that would have occurred absent the Project.

The following figure depicts the process by which MID will evaluate data, respond to complaints, perform operational adjustments or mitigation. The MROC is responsible for resolution of disputes in which MID and a 3rd party are unable to reach agreement on appropriate mitigation measures.

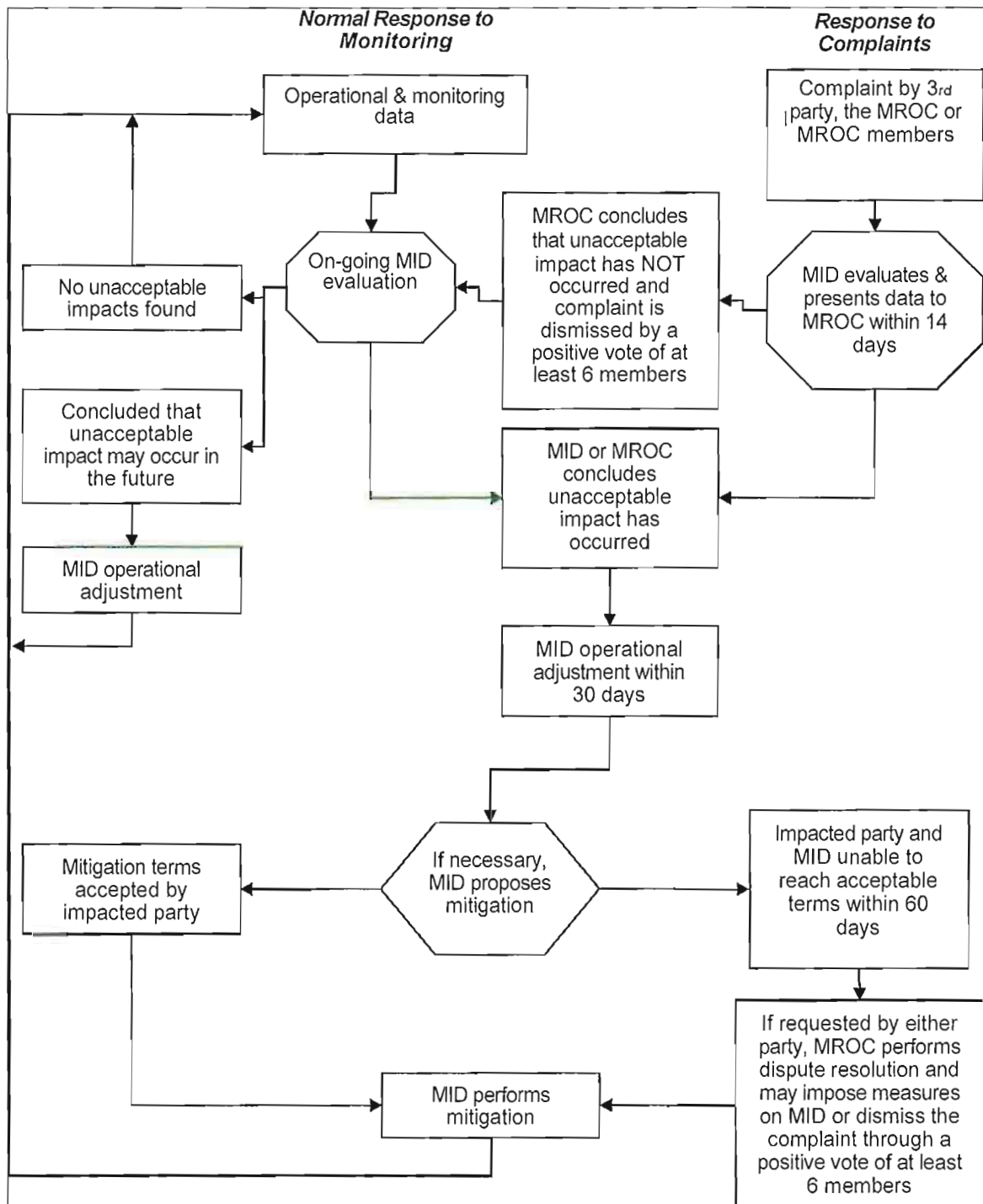


Figure 4: Operational Adjustment and Mitigation Decision Matrix

9.9 MID Evaluations

This section specifies evaluations that will be performed by MID to determine if unacceptable impacts have occurred or may occur as a result of Project operations relative to conditions that would have occurred absent the Project. Examples of problems that can occur from time to time in 3rd party wells include, but are not limited to the following:

- Groundwater levels rising within 30 feet of the ground surface outside of Madera Ranch;
- Well water levels dropping significantly, causing significant increases in pumping costs;
- Well water levels dropping below the point where 3rd party wells can operate adequately; and
- Water quality in 3rd party wells degrading to the degree that they cannot be used for their intended purposes.

The aquifer underlying the Project area has been in chronic overdraft for more than 50 years, characterized by dropping groundwater levels, groundwater quality degradation and periodic failure of wells as water levels drop below pump intakes. In addition, the area is also periodically subject to flooding which can cause temporary shallow groundwater conditions. Finally, old wells/pumps periodically fail or are impacted by installation of nearby wells by other farmers. Taken together, each of the potential Project impacts might also be caused by conditions that are not related to Project operations. Therefore, evaluation of monitoring data must include three levels of analysis as follows:

- Has an undesired condition occurred?
- Will an undesired condition occur if current trends continue?
- Are the undesired conditions impacts caused by Project operations?

The MOCP monitoring network includes a variety of wells anticipated to be outside of the area to be impacted by the Project. Data from these "background" wells will help to distinguish between Project impacts and unrelated trends. In addition, the document, "*Baseline Groundwater Level Report*," (January 2006) presents 20 years of pre-Project groundwater level variations in over 100 wells. Likewise, the land use and well status monitoring elements of this MOCP are designed to identify land/groundwater use changes that might impact wells independent of Project operations. Taken together, these data should enable MID to adequately answer the three questions posed above. A variety of statistical procedures are available to perform these evaluations. Some examples of commonly used guidance documents include the following:

USEPA, "Statistical analysis of groundwater monitoring data at RCRA facilities. Addendum to Interim Final Guidance", Office of Solid Waste, July 1992;

USEPA, "Statistical analysis of groundwater monitoring data at RCRA facilities - Interim Final Guidance", (April 1989); and

Ohio EPA's Division of Hazardous Waste Management, "Technical guidance Manual for Hydrogeologic Investigations and Groundwater Monitoring," February 1995

9.9.1 Water Level Evaluations

Baseline groundwater levels are defined as those groundwater levels that would occur in the absence of the Project. The determination of baseline levels can be complicated because they vary seasonally in response to irrigation pumpage (which changes from year to year as a function of well/pump age, weather and amount of irrigation) and are generally dropping over the long term in response to aquifer overdraft. As a consequence, even without this Project, future groundwater levels are anticipated to rise and fall – with a long term trend downward. These baseline variations must be taken into account when evaluating potential Project impacts. The statistical procedures that are appropriate will vary by parameter, location and time as more monitoring data are collected. Therefore, this MOCP cannot specify the procedures to be used. However, this MOCP does specify the decision framework as follows.

- 1) Within 14 days of receiving a complaint of unacceptable impact, MID will evaluate the complaint as outlined below.
- 2) Otherwise, on a quarterly basis, MID will review the graphs and tabulations specified for Quarterly Water Level Reports (Section 8.2).
- 3) The Quarterly Water Level Reports will include lists of wells which might be currently experiencing undesired conditions and a sub-set of wells which may in the future experience undesired conditions (see Section 8.2). MID will perform statistical analyses to filter out water level declines, water level increases and well/pump failures that are unrelated to Project operations. Factors that may be included in this filtering process include, but are not limited to:
 - Review and confirmatory collection of water levels to ensure that measurement or data entry error has not occurred;
 - Review of 3rd party complaints that are not validated by field measurements;
 - Review of recharge operations to filter out water level rises that had no correspondence to periods in which the Project recharged (even after taking into account time-lags);
 - Review of recovery operations to filter out water level declines that had no correspondence to periods in which the Project recovered (even after taking into account time-lags);
 - Review of baseline and background water level trends to determine which changes would have occurred absent Project Operations. This filtering will entail evaluation of baseline trends (1985-2005) and background trends in wells outside of the Project influence;
 - Review of changes in surrounding land uses (new wells, higher irrigation pumpage etc.) to filter out changes that were due to 3rd party operations unrelated to the Project.
- 4) Step 3 may provide MID with a sub-set of wells for which a 3rd party complained of undesired conditions, but for which MID has concluded that there was no unacceptable impact caused by Project operations. In these circumstances MID will notify the MROC and 3rd party of this finding within 14 days of the complaint. If the MROC agrees with MID's finding, the MROC can vote to dismiss the complaint by a positive vote of at least 6 members. If the MROC disagrees with MID's finding and MID has not reached acceptable terms with the 3rd party within 60 days of the complaint, the MROC can choose to impose an operational constraint or mitigation on MID by a positive vote of at least 6 members.

- 5) Step 3 will provide MID with a sub-set of wells which are apparently currently experiencing unacceptable impacts due to Project operations and a sub-set of wells that may experience unacceptable impacts in the future.
- 6) The list of wells that may experience unacceptable impacts in the future will be used by MID at its discretion to guide future operations. MID will not be obligated to perform operational adjustments in response to this list, but it will be in MID's interests to prevent unacceptable impacts before they occur.
- 7) The list of wells that are apparently currently experiencing unacceptable impacts due to Project operations will be used by MID as follows:
 - o MID will contact the owner of the impacted well within 14 days of having made a determination of unacceptable impact to discuss potential mitigations and/or operational adjustments; and
 - o At MID's discretion, the district can choose to propose any combination of operational adjustments or mitigations to resolve the problem. However, if after 60 days of the original finding, MID and the 3rd party have not reached mutually acceptable terms, either party may seek dispute resolution from the MROC and the MRPOC can choose to dismiss the complaint or impose an operational constraint or mitigation on MID by a positive vote of at least 6 members.

Potential operational adjustments that might be used by MID may include, but are not limited to shifting the locations, schedules and rates at which recharge and recovery are performed. Potential mitigations that might be proposed by MID may include, but are not limited to:

- Reimbursement for higher pumping costs;
- Well rehabilitation;
- Lowering a pump further down a well;
- Providing an alternate water supply; and
- Installation of a new well.

9.9.2 Water Quality Evaluations

Baseline groundwater quality is defined as that which would occur in the absence of the Project. The determination of baseline quality can be complicated because it can vary seasonally and in some areas is degrading over time in response to migration of contaminants, overdraft and overlying land use. As a consequence, even without this Project, future groundwater quality is expected to change with a long term trend of degradation in some areas. These baseline variations must be taken into account when evaluating potential Project impacts. The statistical procedures that are appropriate will vary by parameter, location and time as more monitoring data are collected. Therefore, this MOCP cannot specify the procedures to be used. However, this MOCP does specify the decision framework as follows.

- 1) Within 14 days of receiving a complaint of unacceptable impact, MID will evaluate the complaint as outlined below.
- 2) Otherwise, on a semi-annual basis, MID will review the graphs and tabulations specified for Semi-Annual Water Quality Reports (Section 8.3).
- 3) The Semi-Annual Water Quality Reports will include lists of wells which might be currently experiencing undesired conditions and a sub-set of wells which may in the future experience undesired conditions (see Section 8.3). MID will perform statistical analyses to filter out water quality changes that are unrelated to Project operations. Factors that may be included in this filtering process include, but are not limited to:

- Review and confirmatory collection of water samples to ensure that measurement or data entry error has not occurred;
 - Review of 3rd party complaints that are not validated by field measurements;
 - Review of recharge operations to filter out water quality changes that had no correspondence to periods in which the Project recharged (even after taking into account time-lags);
 - Review of recovery operations to filter out water level changes that had no correspondence to periods in which the Project recovered (even after taking into account time-lags);
 - Review of baseline and background water quality trends to determine which changes would have occurred absent Project Operations. This filtering will entail evaluation of baseline trends and background trends in wells outside of the Project influence;
 - Review of changes in surrounding land uses (changed irrigation practices, new wells, higher irrigation pumpage etc.) to filter out changes that were due to 3rd party operations unrelated to the Project.
- 4) Step 3 may provide MID with a sub-set of wells for which a 3rd party complained of undesired conditions, but for which MID has concluded that there was no unacceptable impact caused by Project operations. In these circumstances MID will notify the MROC and 3rd party of this finding within 14 days of the complaint. If the MROC agrees with MID's finding, the MROC can vote to dismiss the complaint by a positive vote of at least 6 members. If the MROC disagrees with MID's finding and MID has not reached acceptable terms with the 3rd party within 60 days of the complaint, the MROC can choose to impose an operational constraint or mitigation on MID by a positive vote of at least 6 members.
 - 5) Step 3 will provide MID with a sub-set of wells which are apparently currently experiencing unacceptable impacts due to Project operations and a sub-set of wells that may experience unacceptable impacts in the future.
 - 6) The list of wells that may experience unacceptable impacts in the future will be used by MID at its discretion to guide future operations. MID will not be obligated to perform operational adjustments in response to this list, but it will be in MID's interests to prevent unacceptable impacts before they occur.
 - 7) The list of wells that are apparently currently experiencing unacceptable impacts due to Project operations will be used by MID as follows:
 - MID will contact the owner of the impacted well within 14 days of having made a determination of unacceptable impact to discuss potential mitigations and/or operational adjustments; and
 - At MID's discretion, the district can choose to propose any combination of operational adjustments or mitigations to resolve the problem. However, if after 60 days of the original finding, MID and the 3rd party have not reached mutually acceptable terms, either party may seek dispute resolution from the MROC and the MRPOC can choose to dismiss the complaint or impose an operational constraint or mitigation on MID by a positive vote of at least 6 members.

Potential operational adjustments that might be used by MID may include, but are not limited to shifting the recharge water types, locations, schedules and rates at which recharge and recovery are performed. Potential mitigations that might be proposed by MID may include, but are not limited to:

- Reimbursement for treatment costs;
- Installation of treatment systems;
- Providing an alternate water supply; and
- Installation of a new well.

9.9.3 Subsidence Evaluations

Annual subsidence surveys will be used to determine if Project recovery operations are causing ground surface elevations to decline. The data from each annual survey will be compared to previous surveys within 30 days of each annual survey to determine if:

- The elevation at any single location has decreased repeatedly for 3 consecutive surveys;
- The elevation at any single location has decreased more than 0.25 feet (7.6 cm) from the previous survey; or
- The elevations at more than 50% of the survey locations have decreased more than 0.1 feet (3 cm) from the previous survey.

If any of the conditions cited above occur, MID will report the finding to the MROC along with recommendations regarding appropriate next steps to determine if an unacceptable impact is occurring as a result of Project operations. The MROC may choose to impose an operational constraint or mitigation on MID by a positive vote of at least 6 members.

9.10 MID Response to 3rd Party Complaints and MROC Dispute Resolution

As detailed in the previous sections, MID will be obligated to respond to 3rd party complaints of undesired conditions according to the following schedule:

- Within 14 days of MID receipt of the complaint MID will perform evaluations and report back to the MROC and complainant;
- The MROC can choose to conclude that an unacceptable impact has not occurred and can dismiss a complaint through a positive vote of at least 6 members;
- If MID or the MROC concludes that the complaint is valid, within 30 days of MID receipt of the complaint, MID will perform operational adjustments and if necessary propose mitigation measures to the complainant; and
- If mutually acceptable terms for resolution of the complaint have not been reached within 60 days of the complaint, MID or the 3rd party can seek dispute resolution from the MROC and the MROC can dismiss the complaint or impose an operational constraints or mitigation measures on MID through a positive vote of at least 6 members.

MID will keep a separate file for each complaint with dated records regarding date received, results of evaluations, correspondence with the 3rd party and ultimate resolution. MID will make these files available for MROC review upon request. If a complaint is first received by the MROC, it will be promptly forwarded to MID and the schedule specified above will track from the date that the complaint is received by MID.

MID may incur significant costs and time in responding to, verifying and evaluating various complaints. In the event that it is found that the Project did not cause an unacceptable

impact, MID may seek reimbursement from the 3rd party for incurred costs. However, MID is obligated to advise the 3rd party of this potential outcome in advance of incurring the costs.

In the event that MID or the 3rd party seeks dispute resolution from the MROC, the process will be performed in accordance with the following procedures.

- The MROC will review all relevant data and facts regarding the dispute and, if possible, recommend fair and equitable resolution of the dispute. The MROC and its members shall not act in an arbitrary, capricious or unreasonable manner;
- MROC dispute resolution decisions will be approved by a positive vote of at least 6 members;
- MROC imposed mitigation measures will follow the philosophy of restoring a 3rd party's water supply conditions to those that would have been present absent the Project;
- MROC imposed mitigation measures will be limited to reparation of the unacceptable impact. MROC will not have the authority to impose consequential damage measures or punitive measures. At no time will the MROC impose measures beyond those necessary to restore water supply conditions to those that would have existed absent the project; and;
- From time to time, the MROC may need to retain attorneys, technical experts or consultants to aid in a dispute resolution process. In these circumstances, the party which loses (the non-prevailing party) in the dispute resolution ruling will be responsible for payment of these costs.

In the event (1) the MROC fails to act herein provided, (2) any party disputes the MROC recommended resolution or (3) any party fails to implement the MROC recommended resolution; the MROC, MID or the complainant may seek any legal or equitable remedy available as provided below.

Arbitration: If all of the parties agree that a factual dispute exists regarding any recommendation of the MROC made pursuant hereto, or implementation thereof, such disputes shall be submitted to binding arbitration before a single neutral arbitrator appointed by unanimous consent, of all of the parties, and in the absence of such consent, appointed by the presiding judge of the Madera County Superior Court. The neutral arbitrator shall be a registered civil engineer, preferably with a background in groundwater hydrology. The arbitration shall be called and conducted in accordance with such rules as the contestants shall agree upon and, in the absence of such agreement, in accordance with the procedures set forth in California Code of Civil Procedure, Section 1282 et seq. Any other dispute may be pursued through a court of competent jurisdiction as otherwise provided by the law.

3rd Party Remedies: Nothing in this MOCP shall prevent any 3rd party from pursuing any remedy at law or in equity from judicial relief in the event such 3rd party is damaged as a result of the Project.

10 Funding of Monitoring, Committee Activities and Mitigation

MID is the owner and operator of the Project and will therefore fund the following activities:

- Implementation of all monitoring, data management, evaluation and reporting activities specified in this MOCP;
- MID will make MID's board room reasonably available for MROC meetings;
- All operational adjustments and mitigation measures agreed upon with 3rd parties or imposed on MID by the MROC; and
- Payment of attorney, technical expert or consultant costs incurred by the MROC while arbitrating a complaint that is ultimately ruled by the MROC in favor of a 3rd party.

Each of the parties participating in the MROC will be responsible for the personnel and travel costs of its representative on the MROC.

MID may seek reimbursement from 3rd parties for time and costs incurred by MID in responding to 3rd party complaints that were found to not be caused by Project operations. However, MID is obligated to advise the 3rd party of this potential outcome in advance of incurring the costs. Likewise, the MROC may seek reimbursement from 3rd parties for costs for complaints that are ultimately ruled in favor of MID.

Appendix I

Spill Response Plan

Appendix I

Spill Response and Implementation Program

I.1 Introduction

Attachment C, Section B.2.h of the General Permit requires that the SWPPP contain a Spill Response and Implementation Program, which is to describe measures to prevent, control, and minimize effects from spills and leaks of hazardous, toxic, or petroleum products during construction of the project.

Properly managing hazardous and toxic substances and petroleum products on the project site will greatly reduce the potential for storm water pollution by these substances.

I.2 Implementation

This program will be implemented with the commencement of construction and will continue to be implemented in all parts of the construction site where hazardous materials, toxic substances, and petroleum products are present, including, but not limited to, equipment refueling. The program will end with the approval of the submitted Notice of Termination by the State Water Resources Control Board.

I.3 Personnel Training

The Qualified SWPPP Practitioner (QSP) will ensure that site personnel who might be called upon to prevent, contain, and/or clean-up a spill of hazardous, toxic, or petroleum products are properly trained in executing these tasks.

I.4 Material Management Practices

I.4.1 Housekeeping Practices

The proper use of materials and equipment, along with general common sense, greatly reduces the potential for contaminating storm water runoff. Below is a list of housekeeping practices to be implemented during project construction.

- Hazardous materials, chemicals, fuels, and oils will not be stored within 100 feet of a ditch, creek, wetland, or other water feature.
- Construction equipment, except for stationary equipment, will not be fueled within 100 feet of a ditch, creek, wetland, or other water feature. When refueling of stationary equipment is required, the contractor will construct temporary earthen dikes, apply plastic sheeting, and

implement other appropriate measures before refueling begins as required to ensure that any spilled fuels are contained.

- An effort will be made to store only enough product necessary to complete the job.
- Materials stored onsite will be stored in a neat, orderly manner in appropriate containers and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, the entire product will be used before disposing of its container.
- The manufacturer's recommendations for proper use and disposal of a product will be followed.
- If surplus product must be disposed of, the manufacturer's or the local- and state-recommended methods for proper disposal will be followed.

I.4.2 Product-Specific Practices

Because of the chemical makeup of certain products, specific handling and storage procedures are required to promote the safety of handlers and prevent releases of the product into soil and receiving waters. Care will be taken to follow all directions and warnings for products used on the site. All pertinent information can be found on the Material Safety Data Sheets (MSDSs) for each product. The MSDSs will be kept with each product container.

Petroleum Products

Onsite vehicles will be monitored for fluid leaks and will receive regular maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers that are clearly labeled. If possible, the containers will be stored in a covered truck, trailer, or covered shed that provides secondary containment for the products.

Bulk storage tanks and generators with a capacity of more than 55 gallons will have secondary containment. Containment will be provided by a prefabricated temporary containment mat, a temporary earthen dike, or other measure. After each rainfall, the contents of any secondary containment areas will be inspected by the contractor or QSP. If there is no visible sheen on the collected water, it can be pumped onto the ground to percolate into the soil. Pumping of the water will be done in a manner that does not cause soil scour. If a sheen is present, it must be cleaned up prior to discharge of the water.

Bulk fuel or lubricating oil dispensers will have a valve that must be held open to allow the flow of fuel.

During fueling operations, the contractor will have personnel present to detect and contain spills.

I.5 Spill Control and Cleanup Procedures

In addition to the material management practices discussed above, the following spill control and cleanup practices will be implemented to prevent or minimize the impact of storm water pollution.

- Spills will be contained and cleaned up immediately and properly upon their discovery.
- The manufacturer's methods for spill cleanup of a material will be followed as described on the MSDSs.
- Materials and equipment needed for cleanup will be kept readily available onsite in a spill kit, either at an equipment storage area or on the contractor's trucks. Equipment to be kept onsite includes, but is not limited to, brooms, dust pans, shovels, granular absorbents, sand, sawdust, absorbent pads and booms, plastic and metal trash containers, gloves, and goggles.
- Personnel onsite will be made aware of cleanup procedures, the location of spill cleanup equipment, and proper disposal procedures.
- Toxic, hazardous, or petroleum product spills will be reported to the appropriate federal, state, and local agencies, as regulations require.
- Spills will be documented and a record of the spills will be kept at the end of this appendix.

I.6 Notification

The federal reportable spill quantity for petroleum products, as defined in 40 CFR 110, is any oil spill that either:

- violates applicable water quality standards,
- causes a film or sheen on or discoloration of the water surface or adjoining shoreline, or
- causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

The federal reportable spill quantities for hazardous materials are listed in 40 CFR, Part 302.4 in the table titled "List of Hazardous Substances and Reportable Quantities." Contact information for determining whether a spill is reportable is provided in the notification guidance provided at the end of this appendix. If a spill is reportable, the contractor or QSP will notify Central Valley Gas and the Regional Water Quality Control Board (RWQCB).

A written description of reportable releases must be submitted to the RWQCB. This submittal must include the following:

- a description of the release, including the type of material and an estimate of the amount spilled;
- the date of the release;
- an explanation of why the spill occurred; and
- a description of the steps that will be taken to prevent and control future releases.

Notice of Discharge of Toxic or Hazardous Materials

Date:

To:

Subject: Notice of Discharge

Project Name: Madera Irrigation District Water Supply Enhancement Project

In accordance with the California General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (General Permit), State Water Resources Control Board (SWRCB) Order No. 2009-0009-DWQ, the following instance of discharge is noted:

Date, time, and location of discharge:

Insert description and date of event

Nature of the operation that caused the discharge

Insert description of operation

Initial assessment of any impact caused by the discharge

Insert assessment

Existing BMP(s) in place prior to discharge event

List BMPs in place

Date of deployment and type of BMPs deployed after the discharge

BMPs deployed after the discharge (with dates)

Steps taken or planned to reduce, eliminate and/or prevent recurrence of the discharge

Describe steps taken to prevent recurrence

Implementation and maintenance schedule for any affected BMPs

Insert/describe implementation and maintenance schedule

If further information or a modification to the above schedule is required, notify the contact person below.

Name of Contact Person, Title:

Company:

Telephone Number:

Signature

Date

