

Inyo-Mono IRWMP Round 1 Project Implementation Application

Attachment 6: Monitoring, Assessment, and Performance Measures

Project #1: Safe Drinking Water and Fire Water Supply Feasibility Study for Tecopa, California

Project Proponent: Amargosa Conservancy

Project Goals	The goal of the project is to conduct a feasibility study to determine whether potable drinking water stations and fire water storage can be provided to serve the disadvantaged communities of Tecopa and Tecopa Hot Springs.
Desired Outcomes	The desired outcome of the project is the completion of a feasibility study to determine whether potable drinking water stations and fire water storage can be provided to serve the disadvantaged communities of Tecopa and Tecopa Hot Springs.
Output Indicators	<ol style="list-style-type: none">(1) Selection of a qualified consultant to conduct the feasibility study(2) Consultation with the local fire district and with members of the two communities(3) Submission of monthly progress reports indicating that the consultant is timely completing the feasibility study(4) Submission of quarterly progress reports by the Amargosa Conservancy to the Inyo-Mono IRWMP Group (and to DWR, if requested)(5) Timely completion of the final report on the feasibility study
Outcome Indicators	The timely completion of an adequate final feasibility study report will be the primary outcome indicator.
Measurement Tools and Methods	The Amargosa Conservancy will only award a contract to conduct the feasibility study to a qualified consultant. The Amargosa Conservancy will monitor the consultant's work progress by requiring and reviewing monthly progress reports and by reviewing the final feasibility study report.

Project #2: Coleville High School Water Project

Project Proponent: Eastern Sierra Unified School District

Project Goals	Primary goal of the proposed project has been to lower the levels of uranium in the well water serving the Coleville campus
Desired Outcomes	The desired outcome will be to have the radioactivity analysis show that the amount of uranium in the water is below the MCL.
Output indicators-measures to effectively track output	Radioactivity analysis will be performed annually after initial implementation.
Outcome indicators- measures to evaluate changes that is a direct result of the work	New radioactivity analysis will be compared to original test from the technical report.
Measurement tools and methods	Contract operator will take samples from multiple points and submit all samples to lab for radioactivity analysis.
Targets- measurable targets that are feasible to meet during the life of the Proposal	The target is for 0pCi/L of uranium in the treated water. This target is achievable with the periodic replacement of ion exchange resin.

Project #3: Round Valley Joint Elementary School water supply reliability enhancement

Project Proponent: Round Valley Unified School

Project goals	Provide a reliable water supply for Round Valley School incorporating simplicity and redundancy within the proposed design. In addition this project will also provide more adequate water for structural fire protection by providing access to an irrigation ditch on the neighboring property.
Desired outcome	To build a more reliable water system that will minimize the potential of bacterial contamination and provide a consistent, un-interruptive water supply to the school district. In addition the new system would not interrupt student learning and help protect the schools instructional investment.
Output indicators	The project can effectively be divided into four major tasks – (1) drilling and development of the new well, (2) installation of the associated water delivery system. (3) Refurbish old well, and (4) create access to / development of fire protection from nearby irrigation ditch. The outcome of each of these stages can be further divided into completion of discrete tasks. The progress of these indicators will be included in quarterly reports.
Outcome indicators	A second well will be constructed, the existing well will be refurbished, and apprentices will be installed to allow these new components to work as a reliable system. A fire protection system will be installed to provide for quicker, more reliable drafting of water.
Measurement tools and methods	Measurement will be assessed by completion of definitive tasks along the progress of the project. In most cases, these tasks will mark that completion of one phase and the start of a new phase.
Targets	Measurable targets have been delineated on the schedule; see Attachment “RV Schedule”, to define the construction elements. The targets selected will enable an effective means of tracking project performance.

Project #4: New Hilltop Well

Project Proponent: Wheeler Crest Community Services District

Project goals	The goal is to provide a groundwater well for the residents of Hilltop subdivision that is located within the community.
Desired outcome	To provide a reliable water source to eliminate the current dependency on an artesian well that is unreliable, and also to eliminate a 2500-foot plastic supply line that is 55 years old.
Output indicators	The project can effectively be divided into three major tasks: (1) drilling and development of the well, (2) bringing in electrical power, and (3) installation of the water delivery system. The outcome of each of these stages can be further divided into completion of discrete tasks. The progress of these indicators will be included in quarterly reports.
Outcome indicators	There are two major changes that occur in this project and those are the successful pumping of groundwater and the integration of the old water supply system with the new well.
Measurement tools and methods	Measurement will be assessed by completion of definitive tasks along the progress of the project. In most cases, these tasks will mark that completion of one phase and the start of a new phase.
Targets	Measurable targets have been delineated on the schedule, Attachment 5, to define the most important aspects of the well development and associated water supply construction. The targets selected will enable an effective means of tracking project performance.

Project #5: Well Rehabilitation – Phase I

Project Proponent: Mammoth Community Water District

Project goals	Determine whether well profiling technology can result in developing feasible recommendations for isolating contaminants in the District's groundwater wells. The results from the study will benefit other water suppliers that have difficulty meeting water quality objectives due to contaminants in their groundwater supplies.
Desired outcomes	Successful completion of well profiling and feasibility study and feasible recommendations to improve water quality and reliability and improve the flexibility to manage groundwater supplies.
Outcome indicators	All facets of study completed and results compiled in Feasibility Report.
Measurement tools and methods	Deliverable, Feasibility Report.
Targets	Well profiling and feasibility study to be conducted in two MCWD groundwater wells.

Project #6: Lone Pine, Independence, and Laws Pump Operation Redundancy and SCADA Improvements

Project Proponent: Inyo County Department of Public Works

Project Goals	Improve system reliability, off peak pumping.
Desired outcomes	Less water outages, low water events at the tanks, more water in storage, reduction in greenhouse gas emissions.
Output indicators-measures to track output	Contract performance documentation- Daily inspection reports, pay estimates and County Auditor's records documenting payment to contractor.
Output indicators-measures to evaluate change that is a direct result of the work	Less pump start malfunctions, less water outages, SCADA reports demonstrating pump start / pump stop times of day.
Measurement tools and methods	Written records based upon visual observations on a quarterly basis, SCADA generated records of pump start dates and times, calculations of GHG emission reductions. Monthly, quarterly, or annual reports documenting targets and outcomes can be provided as directed by DWR.
Targets	50% reduction in pump start failures and low water events at tanks, 100% reduction in water outages due to SCADA failures, approximately 50,000 gallons more water in storage on a daily basis (guess), 50% reduction in GHG emissions during the peak time of day
Metrics	Number of calls from the redundant auto-dialers, number of low water events at the tanks, number of water outages, increased SCADA monitoring parameters, tons of GHG emissions reduced.

Project #7: CSA-2 Sewer System Upgrade Project

Project Proponent: Inyo County Department of Public Works

Project Goals	<ol style="list-style-type: none"> 1) To reduce sewage spillage and seepage 2) To reduce Infiltration Inflow and water volumes at the USFS Plant 3) To reduce operational costs of CSA-2 system and the USFS Plant 4) To protect habitat of Bishop Creek and adjacent wetlands 5) Decrease amount of Green house gas emissions related to effluent treatment
Desired outcomes	<ol style="list-style-type: none"> 1) A measurable reduction in sewage spillage and seepage 2) A measurable reduction of Infiltration Inflow and water volumes at the USFS Plant 3) Reduction of operational costs of CSA-2 system and the USFS Plant 4) Protection of the habitat of Bishop Creek and adjacent wetlands 5) Reduction in the amount of Green house gas emissions related to effluent treatment
Output indicators-measures to track output	<ol style="list-style-type: none"> 1) Lack of overflow incidents 2) Reduced flow meter readings at the USFS plant 3) Documented reductions in operational costs 4) Reduction in metered electrical service at the USFS treatment plant
Output indicators-measures to evaluate change that is a direct result of the work	<ol style="list-style-type: none"> 1) Lack of overflow incidents 2) Flow meter readings at the USFS plant 3) Documented reductions in operational costs for effluent treatment 4) Reduction in metered electrical service at the USFS treatment plant
Measurement tools and methods	<ol style="list-style-type: none"> 1) Flow and electrical meter readings 2) Counted number of spillage incidents and volumetric measurements of spillage, current compared to previous
Targets-measurable targets that are feasible to meet during the life of the Proposal	<ol style="list-style-type: none"> 1) Lack of overflow incidents, the number of incidents 2) Reduced flow meter readings at the USFS plant 3) Reduced power consumption readings at the watt hour meter for the treatment plant 4) Reduced billings for operational expenses for emergency call-outs

Project #8: Secondary Water Tank Construction – Birchim Community Services District

Project Proponent: Birchim Community Services District

Project Goals

Construction of a secondary water storage tank

Desired Outcomes

45,000 gallons of additional water storage

Output Indicators

N/A

Outcome Indicators

1. Bolt replacement in primary water storage tank
2. Cleaning of primary water storage tank
3. Additional water available for fire fighting

Measurement Tools and Methods

Report from Birchim Community Services District upon bolt replacement and cleaning of primary tank. Annual report from Birchim Community Services District regarding water used by fire fighting crews.

Targets

Cleaning and recoating primary water storage tank every 15 years during the next 50 years.

Project #9: Brackish Water Resource Study

Project Proponent: Indian Wells Valley Water District

The following table lists the performance measures for this project. Since this study is not a construction-type project it is a little more difficult to identify performance measures. Our measures will be monitored through meetings, reports, water quality results from sampling wells in specific areas, updates to maps and updates to our groundwater flow model. Our goal is to as self-reliant as possible in this valley. There is no access to surface water in the Indian Wells Valley with the future possibility of access very uncertain at this time. Therefore, development of a brackish groundwater resource to augment to local water supply could be crucial for the economic future of the valley.

Project Goals	<ul style="list-style-type: none">• Identify & address data gaps in the IWV.• Analyze basin geochemistry.• Update local mapping of valley groundwater resources and groundwater flow model.
Desired Outcomes	<ul style="list-style-type: none">• Confirm quality & quantity of brackish groundwater in the IWV.• Determine if brackish groundwater is a reliable future source of water for the IWV.
Output Indicators – to track output	<ul style="list-style-type: none">• Monthly meetings & quarterly progress reports provided by consultant.• Updates to valley GIS maps.• Updated groundwater flow model.• Water quality reports.
Output Indicators – to evaluate change that is direct result of the work.	<ul style="list-style-type: none">• Development of a new water resource in the valley.• Future treatment of brackish groundwater for potable use.
Measurement Tool & Method	<ul style="list-style-type: none">• Amount of brackish groundwater treated to potable standards to augment the current water supply (future).
Targets	<ul style="list-style-type: none">• Avoidance of water purchases outside of the IWV. At this time there is no other source of potable water in the valley besides groundwater.
Metrics	<ul style="list-style-type: none">• Acre-ft of water produced by treating brackish groundwater (future).

Project #10: Lone Pine and Laws Tank Project

Project Proponent: Inyo County Department of Public Works

Project Goals	Improve system reliability, optimize Lone Pine tank.
Desired outcomes	Less water outages in Laws. Protection of the existing tank in Lone Pine
Output indicators-measures to track output	Contract performance documentation- Daily inspection reports, pay estimates and County Auditor's records documenting payment to contractor.
Output indicators-measures to evaluate change that is a direct result of the work	Less water outages in Laws, Longer tank life in Lone Pine
Measurement tools and methods	Laws- written records based upon visual observations on a yearly basis, Lone Pine- tank inspection reports every three years.
Targets	Improved system reliability, Longer tank life.
Metrics	Average number of gallons of water in hydropneumatic tank. Results of written inspection report by diver or tank entry and inspection.

Project #11: Water Meter Installation – Final Phase

Project Proponent: June Lake Public Utilities District

Project Goals – 1) Water efficiency, reduction in water demand and production which helps sustain and/ or increase flows to lakes and streams thereby supporting plants, fish and wildlife. 2) Reduce or eliminate the need for additional infrastructure (water treatment facilities). 3) Reduction in water production operating expenses such as electricity and chemical supplies associated with water pumping, treatment and distribution.

Desired outcomes – Reduce water demand which reduces production and associated costs.

Output indicators – Installation of 145 customer water meters

Outcome indicators – A 12-15% decrease in water consumption. Monthly water meter usage that will be compared to previous years productions prior to the installation of the 145 water meters

Measurement tools and methods – Flow meters located at source diversion sites, production meters at treatment plants and individual customer water meters.

Targets – A gradual decrease in water demand and production measured monthly through meter usage and production flow meter monitoring during the life of the Proposal

Project #12: Lone Pine, Independence, and Laws Water Meter Project

Project Proponent: Inyo County Department of Public Works

Project Goals	<ol style="list-style-type: none"> 1) Replace the residential analog meters with automatic electronic read meters. 2) Renovate the Town Demand Meters. 3) Replace the billing system software.
Desired outcomes	<ol style="list-style-type: none"> 1) Accurate measurement of individual water usage and efficient monitoring of the town's gross water demand. 2) Provide better accounting and billing information. 3) Promote water conservation. 4) Convert to automatic electronic read meters to reduce meter reading time from 10 days to 1-3 days. 5) Provide more efficient operations and reduced costs.
Output indicators-measures to track output	Contract performance documentation- Daily inspection reports, pay estimates and County Auditor's records documenting payment to contractor.
Output indicators-measures to evaluate change that is a direct result of the work	<ol style="list-style-type: none"> 1) Accurate reading of individual residence water consumption 2) Improved record keeping, accounting and accurate billing 3) Improved measurement of town demand for water allocation records 4) Identify heavy water consumers to educate and recommend water conservation measures 5) Reduce labor and fuel costs by reducing meter reading time 6)
Measurement tools and methods	<ol style="list-style-type: none"> 1) Billing records 2) Town demand meter reads
Targets	Improved system reliability, Longer tank life.
Metrics	<p>Units of water billed.</p> <p>Acre feet of water purveyed into the towns.</p>

Project #13: Wastewater Treatment Plant Upgrades – Phase I

Project Proponent: June Lake Public Utilities District

Project Goals – To enhance our wastewater treatment process water quality percolation into the ground thereby improving groundwater recharge into the Mono Basin and groundwater's downstream of project.

Desired outcomes – Improved ground water quality by improved wastewater treatment process.

Output indicators – Install new screening system at the head works of our treatment process and make necessary repairs to our influent oxidation ditch.

Outcome indicators - Monitor (BOD) Biochemical Oxygen Demand on a monthly basis taking samples from the effluent discharge for a year after project completion. Currently BOD samples are taken on a quarterly basis. BOD test results shall be less than 45 ppm/mg .

Measurement tools and methods – BOD test samples will be will be submitted monthly for testing to a certified laboratory. Samples will be taken from the effluent water supply.

Targets – Biochemical Oxygen Demand to be tested monthly with anticipation of a gradual decrease over the life of the proposal.

Project #14: Inyo/Mono Watersheds Invasive Weed Control Project

Project Proponent: Inyo County

Analysis regarding the effectiveness of this project will be conducted by measuring how many acres of invasive plants are managed, and also net acreage reduction these sites undergo over three growing seasons. This is consistent with the IRWMP which states invasive species management as a goal. Net acreage data from 2010 will be used as baseline values. The calculation to determine acreage reduction will be determined using two methods. The first method will be to use GPS equipment to determine the edge boundaries for site specific infestations. This will establish gross acreages for weed populations. The second method will determine net acreages during each site visit. This will be calculated by converting herbicide usage to net acres covered (using precisely calibrated sprayers), or by counting plants when mechanical control is preferred.

The goal of this project is to attain a 25% or more reduction in current invasive plant net acreage based on the 2010 survey numbers. Targets that this project considers feasible would be an 8.3% reduction per management season.

Project #15: Town of Mammoth Lakes Stormwater Master Plan Development and Implementation

Project Proponent: Town of Mammoth Lakes

1. Capital Improvement Projects
 - a. Erosion Control Area (yrd², acres or ft²) treated or sediment reduced using RUSLE 2 or another model
 - b. Water quality – cfs, acre feet or ft³ water treated
 - c. Linear ft of conveyance improvements
 - d. Pollutant load – Could develop or modify existing models (i.e. EPA SWMM) to model before and after pollutant loads
2. Operations & Maintenance
 - a. Sweeping – yrds³ material captured annually
 - b. Maintenance of capture and treatment devices – yrds³ of material captured or gallons of stormwater removed
 - c. Condition – Through the development and deployment of a comprehensive maintenance program condition surveys can be tracked over time. The performance of BMP's is a direct function of condition so long term tracking of condition is a good way to evaluate effectiveness
3. Finance Strategy
 - a. The survey discussed as a part of the development of a finance strategy is a direct measurement of public/resident stormwater knowledge and willingness to support the program
4. BMP Retrofit Program
 - a. # of parcels with unpaved access roads/driveways or # of parcels with BMP's for driveways and access roads
 - b. Evaluate ft² or acres of bare unstable driveways and access roads pre Stormwater Master Plan vs. same numbers post development and implementation
5. Increase Groundwater Recharge
 - a. Survey and evaluate existing older dry well numbers and condition.
 - b. Develop replacement program and incentives for replacement of private existing non-effective dry wells.