



KERN IRWMP

Integrated Regional Water Management Plan

Project Submittal Form

To the extent possible this form should be electronically filled out and e-mailed to:

KernIRWMP@kcwa.com.

Part 1. Lead Implementing Agency/Organizational Information

Please provide the following information regarding the project sponsor and proposed project.

Implementing Agency/ Organization / Individual:

Kern County Water Agency

Agency / Organization / Individual Address:

PO Box 58
Bakersfield, CA 93302-0058

Possible Partnering Agencies:

Name:

Martin Varga

Title:

Engineering and Groundwater Services Manager

Telephone:

(661) 634-1448

Fax:

Email:

mvarga@kcwa.com

Website:

Project Name:

Pilot Program utilizing Bionitrification of Groundwater

Either the latitude/longitude or a location description is required. To determine the latitude/longitude, use the closest address or intersection. If the project is linear, use the furthest upstream latitude/longitude.

Project Latitude:

Project Longitude:

Location Description:	2 wells in a disadvantaged community that are high in nitrate concentrations
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Regional Grouping: Identify the Regional Grouping your *agency* is located in, and the Regional Grouping your *project* is located in.

<input type="checkbox"/> Agency <input type="checkbox"/> Project	Greater Bakersfield
<input type="checkbox"/> Agency <input checked="" type="checkbox"/> Project	Kern County
<input checked="" type="checkbox"/> Agency <input type="checkbox"/> Project	Kern County Water Agency
<input type="checkbox"/> Agency <input type="checkbox"/> Project	Kern Fan
<input type="checkbox"/> Agency <input type="checkbox"/> Project	Kern River Valley
<input type="checkbox"/> Agency <input type="checkbox"/> Project	Mountains/Foothills
<input type="checkbox"/> Agency <input type="checkbox"/> Project	North County
<input type="checkbox"/> Agency <input type="checkbox"/> Project	South County
<input type="checkbox"/> Agency <input type="checkbox"/> Project	West Side

Project Cooperating Agency(ies)/Organization(s)/Individual(s):

-
-
-
-

Project Status (e.g., new, ongoing, expansion, new phase):

new

Part 2. Project Need

It is important to understand the need(s) or issue(s) that the proposed project will address and the benefits that it will provide. Information provided in this section defines the need(s) or issue(s) that the proposed project will address and will help to catalog existing need(s) or issue(s) in the Tulare Lake Basin Portion of Kern County Region.

Please provide a 1-2 paragraph description of the need(s) or problem(s) that the project will address. As applicable, discuss the water supply need, operational efficiency need, water quality need, or resource stewardship need (e.g. ecosystem restoration, floodplain management) need. Discuss critical impacts that will occur if the proposal is not implemented.

Many disadvantaged communities struggle to deal with relatively poor groundwater as their main source of drinking water. Although technologies do exist to treat some of these water quality concerns the technology is relatively expensive for start-up and the maintenance cost can be prohibitive. Nitrate is a common contaminant in many of the groundwater basins in California. The level of nitrate in many Kern County wells is near or above the drinking water limit of 45 mg/L. The groundwater basin in the Kern County portion of the San Joaquin Valley is an interior drainage basin with limited surface of subsurface outflow. As such, salts, including nitrate, draining into the basin tend to accumulate and concentrate over time. Many of the nitrate-laden groundwater wells in Kern County remain untapped. A viable nitrate treatment technology could remove the primary obstacle to using the local groundwater, and thus reduce reliance on imported surface water.

Part 3. Project Description

A general description of the proposed project is needed. This section will provide information associated with the project concept, general project information, and readiness to proceed. It is recognized that much of the requested information may not be available for projects that are at a conceptual level of project development. We appreciate and need your ideas.

Please provide a 1-2 paragraph description of the project including the general project concept, what will be constructed/implemented, how the constructed project will function, and treatment methods, as appropriate.

This program would include the initial water quality assessment of viable wells that meet the criteria for the study, the pilot plant described below, and ongoing maintenance and operations of the plant.

The development of a pilot-scale drinking water biodenitrification treatment plant aimed as gathering design and operational data that could be used to determine the economic and technical feasibility of a full-scale biodenitrification treatment plant for removing nitrate from Kern County groundwater is the goal of this program. The pilot plant will not be limited to the biological process, but will also include the necessary post treatment processes. The pilot plant will include two separate trains: one heterotrophic biodenitrification train, and one autotrophic biodenitrification train. The side-by-side comparison of the two types of processes provides for an excellent opportunity to compare and contrast each process relative to cost, operability, safety, and quality of treated water. It is also important to note that the system designs simulated at the pilot-scale will be non-proprietary designs.

The focus of the study will be on practical application of the biodenitrification systems to nitrate removal from Kern County groundwater. As such, pilot testing objectives will include optimization of system design and operation, demonstration of treatment system reliability and operability, and meeting water quality objectives aimed at both regulatory compliance and consumer acceptance/aesthetic quality. The pilot plant will be operated for a period of 12 months in order to quantify the impact of seasonal changes in water quality and environmental conditions on the performance and operability of each treatment system. A Technical Advisory Panel (TAP) will be assembled and will include academic and industry experts on biological treatment, water quality, and process engineering. Quarterly progress reports will be generated, and a comprehensive project final report will be prepared. The project report will include layouts and preliminary design criteria for a full-scale drinking water biodenitrification treatment plant.

If applicable, list surface water bodies and groundwater basins associated with the proposed project:

• San Joaquin Valley Groundwater Basin, Sub-basin Kern County
•
•
•

Please identify up to three available documents which contain information specific to the proposed project:

• "Demonstration of Biological Nitrate Removal from Groundwater, A Strawman Proposal" by Water Quality and Treatment Solutions, Inc.
•
•

Is the proposed project an element or phase of a regional or larger program?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If yes, please identify the program	_____
Design life of the Project	
Proposed Construction/Implementation Start Date:	_____
Proposed Construction/Implementation Completion Date	_____
Ready for Construction Bid	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA

Item	Status (e.g., not initiated, in process, complete)	Date
Conceptual Plans	<u>In process</u>	(mm/dd/yyyy)
Land Acquisition/ Easements	<u>Not required</u>	(mm/dd/yyyy)
Preliminary Plans	<u>In process</u>	(mm/dd/yyyy)
CEQA/NEPA	<u>Not initiated</u>	(mm/dd/yyyy)
Permits	<u>Not required</u>	(mm/dd/yyyy)
Construction Drawings	<u>Not initiated</u>	(mm/dd/yyyy)

For projects that do not include construction, please briefly describe the project readiness-to proceed.

The project would utilize current wells and would require close monitoring of those wells in terms of bacterial and chemical dosage and water quality sampling events. It is likely the project would be exempt from CEQA requirements.

Part 4. Project Benefits

Please provide a 1-2 paragraph description of the benefit(s) that the project will address. Information provided will be used in the assessment of project benefits.

The greatest advantage of biological denitrification over Ion Exchange or Reverse Osmosis treatment is that no brine waste stream is generated. The only waste stream is backwash water containing high bacterial counts. Waste backwash water can be discharged into the sanitary sewer, or used for local land application. During the last three years, a number of pilot studies have been conducted to evaluate this technology and its applicability as a drinking water treatment process. The California Department of Public Health (CDPH) has granted provisional approval for the design of a 2.5 MGD biodenitrification plant in Riverside County.

Please describe the dominant existing land use type for the proposed project location.

Existing or new water wells, any land use type

Please describe the dominant existing land use type for areas upstream and downstream of the proposed project location

Upstream:
Downstream:

Does the project address any known environmental justice issues?

Yes No Not Sure

Is the project located within or adjacent to a disadvantaged community?

Yes No Not Sure

Does the project include disadvantaged community participation?

Yes No Not Sure

If yes, please identify the group or organization: _____

Please provide the following project benefit information for all applicable components of the proposed project. Benefit categories include things such as water quality / flood management, water supply, and resource stewardship. PLEASE ATTEMPT TO SUPPLY ALL INFORMATION RELEVANT TO YOUR PROJECT. THIS INFORMATION WILL BE USED TO ANALYZE AND ASSESS PROJECT FOR FUTURE FUNDING.

WATER QUALITY BENEFITS / FLOOD MANAGEMENT BENEFITS

Water Quality Benefit Information	
Treatment technologies	<u>Biodenitrification</u>
Design operational treatment capacity (million gallons/day)	<u>Approximately 3.8 MGD assuming rate of 3 CFS per well, 2 wells initially</u>
Targeted Contaminants (Check all that apply):	
<input type="checkbox"/> Chloride <input checked="" type="checkbox"/> Nitrogen Compounds <input type="checkbox"/> Coliform Bacteria <input type="checkbox"/> Other (describe):	
Flood Management Benefit Information	
Maximum volume of temporary storage of storm runoff (acre-feet)	_____
Maximum increased conveyance capacity (cubic feet/second)	_____
Estimated area benefiting from flood damage reduction (acres)	_____
Estimated level of flood protection resulting from project implementation	_____
Estimated annual value of flood damage reduction provided by project (\$/year)	_____
Acreage required for project implementation	_____

WATER SUPPLY BENEFITS

Project information provided will help to quantify water supply benefits from enhanced local water supply or reduced potable water demand.

Enhanced Water Supply or Demand Reduction Benefit Information			
Source of Increased Supply or Demand Reduction			
<input checked="" type="checkbox"/> Groundwater	<input checked="" type="checkbox"/> Groundwater treatment	<input type="checkbox"/> Increased surface water storage	
<input type="checkbox"/> Recycled water	<input type="checkbox"/> Conservation/ water use efficiency	<input type="checkbox"/> Ocean desalination	
<input type="checkbox"/> Transfer	<input type="checkbox"/> Other (describe): _____		
Type of enhanced supply or demand reduction: _____			
Annual Yield of Supply (acre-feet): <u>4343 AFA for pilot program</u>			
Availability by Water-Year Type (acre-feet per year):			
Average Year	<u>4343 AF</u>		
Dry Year	<u>4343 AF</u>		
Wet Year	<u>4343 AF</u>		
Availability by Season (check all that apply):			
<input checked="" type="checkbox"/> Summer	<input checked="" type="checkbox"/> Fall	<input checked="" type="checkbox"/> Spring	<input checked="" type="checkbox"/> Winter
Does the project have the potential to displace demands on the Bay/Delta/Estuary?			
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Not Sure	

For projects that include detention and groundwater recharge, please complete the following:

How many acres of land drain into this detention basin? (acres)	_____
Detention Basin area (acres)	_____
Detention basin max. operational depth (ft.)	_____
% of basin covered by wetlands	_____
Soil type	_____
If other than infiltration, identify method (e.g., injection) and recharge (acre-feet/year)	_____
Estimated basin annual inflow (acre-feet/year)	_____
Estimated basin annual outflow (acre-feet/year)	_____

RESOURCE STEWARDSHIP BENEFITS

Project information provided will help to quantify the benefits associated with projects related to resource stewardship and land management.

Non-treatment wetland area (acres)	_____
Treatment wetland area (acres)	_____
Riparian habitat area (acres)	_____
Non-developed open space area (acres)	_____
Multiple use/ recreation area (acres) – additionally, select the type of multiple use / recreation and associated acres by type:	
Single Sport Athletics	_____
Multiple Sport Athletics Acres	_____
Other Recreation Acres	_____
Pedestrian Trail Acres	_____
Equestrian Trail Acres	_____
Other Passive Activity	_____
Other Acres (describe)	_____
Description	_____
Total Project area (acres)	_____

Part 5. Project Cost Estimate

Project cost information is needed to assist in comparing benefits and cost. Additionally, knowledge of the project type and cost will assist in identifying funding sources for potential projects.

Please indicate the estimated costs of project implementation and associated funding source(s). These costs should include land purchase/easement, planning/design/engineering, construction/implementation, environmental compliance, administration, and contingency.

Approximate Total Cost <i>(If project costs are variable, please include lower and upper range estimates.)</i>	\$1,500,000 to \$2,200,000
Funding Source <i>(If multiple sources, list each source and the percent or amount funded by each)</i>	
Funding Certainty & Longevity	1 year for pilot program, with layouts and preliminary design criteria for a full-scale drinking water plant
Operations & Maintenance Cost <i>(per year)</i>	included
Operations & Maintenance Funding Source(s) <i>(i.e., annual budget, grant, etc. If multiple sources, list each source and the percent or amount funded by each.)</i>	
Operations & Maintenance Funding Certainty <i>(i.e., already included in organization's budget, contingent upon grant, etc.)</i>	

Part 6. Regional Objectives

Indicate below whether the project meets any of the Kern IRWMP regional objectives. Where necessary/appropriate, please provide a brief explanation as to how the Project meets the regional objective.

Kern IRWMP Objectives	Does the project meet the objective?		Comments/Explanation
	Yes	No	
Increase Water Supply (WS)			
1. Through cooperation and collaboration with other regions restore water supplies to levels that will mitigate for water lost from the region and eliminate overdraft		X	
2. Pursue and implement cost effective water use efficiency programs		X	
3. Increase water storage capacity in the region by increasing recharge acreage and expanding groundwater banking programs before all prime recharge land has been developed		X	
4. Integrate management of water banking facilities to maximize conjunctive use over the planning horizon		X	
5. Increase/augment water supplies to meet region demands	X		
Improve Operational Efficiency (OE)			
1. Increase transfers and exchanges flexibility over the planning horizon	X		Potentially
2. Create tools to re-regulate water supplies within the region, including storage, storm flows, and operational flows over the planning horizon		X	
3. Increase distribution efficiencies and reduce energy usage over the planning horizon		X	
4. Increase the use of alternate energy sources (e.g. solar)		X	
5. Replace aging infrastructure to reduce system water losses, improve operational efficiencies, and reduce service interruptions		X	
6. Increase the use of recycled water for direct reuse within the Kern Region		X	
7. Optimize local management of water resources to improve water supply reliability over the planning horizon	X		

8. Increase pool of qualified candidates to operate water and wastewater systems	X	Would require water operators to run, more jobs for qualified personnel
Improve Water Quality (WQ)		
1. Monitor and/or manage headwaters/areas of origin, natural streams, and recharge areas to prevent or mitigate contamination	X	Directly mitigate nitrate contamination
2. Identify and preserve prime recharge areas in the Kern fan area and other areas	X	
3. Improve water quality for disadvantaged communities and the watershed over the planning horizon	X	
4. Continue to provide drinking water that meets or exceeds water quality standards; and support efforts to attain appropriate standards throughout the planning horizon	X	
5. Maximize the use of lesser quality water for appropriate uses (landscaping, certain ag crops, “aesthetic” projects) throughout the planning horizon	X	Potentially
6. Coordinate and enhance aquatic pest control efforts from this point forward	X	
Promote Land Use Planning and Resource Stewardship (LU)		
1. Promote stewardship of the Kern River by applying appropriate measures in various reaches of the river from this point forward	X	
2. Encourage the removal of non-native invasive plant species that affect water quality, reliability, and operations	X	
3. Identify and promote the regeneration and restoration of native riparian habitat	X	
4. Coordinate agricultural and urban water suppliers to more effectively address land use planning issues from this point forward	X	
5. Improve the linkage between land use planning and water supply in the region throughout the planning horizon	X	
6. Increase educational opportunities to improve public awareness of water supply, conservation, and water quality issues throughout the planning horizon	X	Great PR/Educational
7. Improve and coordinate integrated land use planning to support stewardship of environmental resources, such as the Kern River and Kern Fan, and integrate with habitat conservation plans and other ongoing planning efforts from this point forward	X	

8. Preserve and improve ecosystem/watershed health throughout the planning horizon	X	
Improve Regional Flood Management (FM)		
1. Improve regional flood management by addressing preparedness, response, and post flood actions throughout the planning horizon	X	
2. Reduce the effects of poor quality runoff throughout the planning horizon	X	
3. Identify and promote innovative flood management projects to protect vulnerable areas	X	
4. Plan new developments to minimize flood impacts from this point forward	X	



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Part 1. Lead Implementing Agency/Organizational Information

Please provide the following information regarding the project sponsor and proposed project.

Implementing Agency/ Organization / Individual:

Kern County Water Agency

Agency / Organization / Individual Address:

PO Box 58
Bakersfield, CA 93302-0058

Possible Partnering Agencies:

Name:

Martin Varga

Title:

Engineering and Groundwater Services Manager

Telephone:

(661) 634-1448

Fax:

Email:

mvarga@kcwa.com

Website:

Project Name:

Photovoltaic array

Either the latitude/longitude or a location description is required. To determine the latitude/longitude, use the closest address or intersection. If the project is linear, use the furthest upstream latitude/longitude.

Project Latitude:

Project Longitude:

Location Description:	Southeast corner of 30S/26E-06 on Pioneer Property
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Regional Grouping: Identify the Regional Grouping your *agency* is located in, and the Regional Grouping your *project* is located in.

<input type="checkbox"/> Agency <input type="checkbox"/> Project	Greater Bakersfield
<input type="checkbox"/> Agency <input type="checkbox"/> Project	Kern County
<input checked="" type="checkbox"/> Agency <input type="checkbox"/> Project	Kern County Water Agency
<input type="checkbox"/> Agency <input checked="" type="checkbox"/> Project	Kern Fan
<input type="checkbox"/> Agency <input type="checkbox"/> Project	Kern River Valley
<input type="checkbox"/> Agency <input type="checkbox"/> Project	Mountains/Foothills
<input type="checkbox"/> Agency <input type="checkbox"/> Project	North County
<input type="checkbox"/> Agency <input type="checkbox"/> Project	South County
<input type="checkbox"/> Agency <input type="checkbox"/> Project	West Side

Project Cooperating Agency(ies)/Organization(s)/Individual(s):

•
•
•
•

Project Status (e.g., new, ongoing, expansion, new phase):

new

Part 2. Project Need

It is important to understand the need(s) or issue(s) that the proposed project will address and the benefits that it will provide. Information provided in this section defines the need(s) or issue(s) that the proposed project will address and will help to catalog existing need(s) or issue(s) in the Tulare Lake Basin Portion of Kern County Region.

Please provide a 1-2 paragraph description of the need(s) or problem(s) that the project will address. As applicable, discuss the water supply need, operational efficiency need, water quality need, or resource stewardship need (e.g. ecosystem restoration, floodplain management) need. Discuss critical impacts that will occur if the proposal is not implemented.

As energy costs continue to climb, new ways to minimize this cost are becoming urgent. Kern County has an average 272 sunny days a year, providing ample sunshine for photovoltaic array systems. These systems would help mitigate rising costs associated with moving water. Rebate programs and incentives may still be available. Photovoltaic supplementation would increase operational efficiency and would assist in resource stewardship as less outside energy would be necessary. The property is ideally located adjacent to 2 banking projects and is not in use as a recharge facility.

Part 3. Project Description

A general description of the proposed project is needed. This section will provide information associated with the project concept, general project information, and readiness to proceed. It is recognized that much of the requested information may not be available for projects that are at a conceptual level of project development. We appreciate and need your ideas.

Please provide a 1-2 paragraph description of the project including the general project concept, what will be constructed/implemented, how the constructed project will function, and treatment methods, as appropriate.

<p>On the Pioneer North Property approximately 150 acres of land are fallow that is not currently used for recharge due to an agreement with the former landowner. This land is ideally located on the western edge of the Pioneer North Property and is adjacent to the Kern Water Bank (separated by the BNSF railroad) with the Cross Valley Canal bordering the Northern side. This location is isolated, far from any public roads, and secure. There is enough acreage to install a 5-MW to 20-MW (depending on funding, cost-benefit-analysis) photovoltaic array on the property. This project would provide an independent source of energy to offset the high cost of outside energy during recovery operations. The land has already been purchased, but no preliminary plans are available at this time.</p>

If applicable, list surface water bodies and groundwater basins associated with the proposed project:

<ul style="list-style-type: none">• San Joaquin Valley Groundwater Basin, Sub-basin Kern County
<ul style="list-style-type: none">• Cross Valley Canal
<ul style="list-style-type: none">•
<ul style="list-style-type: none">•

Please identify up to three available documents which contain information specific to the proposed project:

<ul style="list-style-type: none">•
<ul style="list-style-type: none">•
<ul style="list-style-type: none">•

Is the proposed project an element or phase of a regional or larger program?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If yes, please identify the program	_____
Design life of the Project	
Proposed Construction/Implementation Start Date:	_____
Proposed Construction/Implementation Completion Date	_____
Ready for Construction Bid	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA

Item	Status (e.g., not initiated, in process, complete)	Date
Conceptual Plans	<u>In process</u>	(mm/dd/yyyy)
Land Acquisition/ Easements	<u>complete</u>	(mm/dd/yyyy)
Preliminary Plans	<u>In process</u>	(mm/dd/yyyy)
CEQA/NEPA	<u>Not initiated</u>	(mm/dd/yyyy)
Permits	<u>not initiated</u>	(mm/dd/yyyy)
Construction Drawings	<u>Not initiated</u>	(mm/dd/yyyy)

For projects that do not include construction, please briefly describe the project readiness-to proceed.

Part 4. Project Benefits

Please provide a 1-2 paragraph description of the benefit(s) that the project will address. Information provided will be used in the assessment of project benefits.

The photovoltaic project will primarily help offset dependence on outside power supplies and cost. The project will provide electricity to run either wells or pump stations along the Cross Valley Canal. Approximately 150 acres of land could house a maximum of 20 MW photovoltaic array (capable of running approximately 60 wells).

Please describe the dominant existing land use type for the proposed project location.

Fallow. Part of Pioneer North, no spreading ponds exist on this portion of property.

Please describe the dominant existing land use type for areas upstream and downstream of the proposed project location

Upstream: residential facilities, residential Bakersfield

Downstream: recharge facilities

Does the project address any known environmental justice issues?

Yes – air pollution mitigation No Not Sure

Is the project located within or adjacent to a disadvantaged community?

Yes No Not Sure

Does the project include disadvantaged community participation?

Yes No Not Sure

If yes, please identify the group or organization: _____

Please provide the following project benefit information for all applicable components of the proposed project. Benefit categories include things such as water quality / flood management, water supply, and resource stewardship. PLEASE ATTEMPT TO SUPPLY ALL INFORMATION RELEVANT TO YOUR PROJECT. THIS INFORMATION WILL BE USED TO ANALYZE AND ASSESS PROJECT FOR FUTURE FUNDING.

WATER QUALITY BENEFITS / FLOOD MANAGEMENT BENEFITS

Water Quality Benefit Information	
Treatment technologies	
Design operational treatment capacity (million gallons/day)	
Targeted Contaminants (Check all that apply):	
<input type="checkbox"/> Chloride <input type="checkbox"/> Nitrogen Compounds <input type="checkbox"/> Coliform Bacteria	
<input type="checkbox"/> Other (describe):	
Flood Management Benefit Information	
Maximum volume of temporary storage of storm runoff (acre-feet)	_____
Maximum increased conveyance capacity (cubic feet/second)	_____
Estimated area benefiting from flood damage reduction (acres)	_____
Estimated level of flood protection resulting from project implementation	_____
Estimated annual value of flood damage reduction provided by project (\$/year)	_____
Acreage required for project implementation	_____

WATER SUPPLY BENEFITS

Project information provided will help to quantify water supply benefits from enhanced local water supply or reduced potable water demand.

Enhanced Water Supply or Demand Reduction Benefit Information		
Source of Increased Supply or Demand Reduction		
<input type="checkbox"/> Groundwater	<input type="checkbox"/> Groundwater treatment	<input type="checkbox"/> Increased surface water storage
<input type="checkbox"/> Recycled water	<input type="checkbox"/> Conservation/ water use efficiency	<input type="checkbox"/> Ocean desalination
<input type="checkbox"/> Transfer	<input checked="" type="checkbox"/> Other (describe): <u>reduce demands on power costs, thereby reducing operating costs</u>	
Type of enhanced supply or demand reduction: _____		
Annual Yield of Supply (acre-feet):		
Availability by Water-Year Type (acre-feet per year):		
Average Year		
Dry Year		
Wet Year		
Availability by Season (check all that apply):		
<input checked="" type="checkbox"/> Summer	<input checked="" type="checkbox"/> Fall	<input checked="" type="checkbox"/> Spring <input checked="" type="checkbox"/> Winter
Does the project have the potential to displace demands on the Bay/Delta/Estuary?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Not Sure

For projects that include detention and groundwater recharge, please complete the following:

How many acres of land drain into this detention basin? (acres)	_____
Detention Basin area (acres)	_____
Detention basin max. operational depth (ft.)	_____
% of basin covered by wetlands	_____
Soil type	_____
If other than infiltration, identify method (e.g., injection) and recharge (acre-feet/year)	_____
Estimated basin annual inflow (acre-feet/year)	_____
Estimated basin annual outflow (acre-feet/year)	_____

RESOURCE STEWARDSHIP BENEFITS

Project information provided will help to quantify the benefits associated with projects related to resource stewardship and land management.

Non-treatment wetland area (acres)	_____
Treatment wetland area (acres)	_____
Riparian habitat area (acres)	_____
Non-developed open space area (acres)	_____
Multiple use/ recreation area (acres) – additionally, select the type of multiple use / recreation and associated acres by type:	
Single Sport Athletics	_____
Multiple Sport Athletics Acres	_____
Other Recreation Acres	_____
Pedestrian Trail Acres	_____
Equestrian Trail Acres	_____
Other Passive Activity	_____
Other Acres (describe)	_____
Description	_____
Total Project area (acres)	<u>150 acres, not in use, maximum 20 MW photovoltaic array</u>

Part 5. Project Cost Estimate

Project cost information is needed to assist in comparing benefits and cost. Additionally, knowledge of the project type and cost will assist in identifying funding sources for potential projects.

Please indicate the estimated costs of project implementation and associated funding source(s). These costs should include land purchase/easement, planning/design/engineering, construction/implementation, environmental compliance, administration, and contingency.

<p>Approximate Total Cost <i>(If project costs are variable, please include lower and upper range estimates.)</i></p>	<p>\$27,500,000 (5 MW) to \$170,000,000 (20 MW)</p>
<p>Funding Source <i>(If multiple sources, list each source and the percent or amount funded by each)</i></p>	
<p>Funding Certainty & Longevity</p>	<p>Design life – 40 years</p>
<p>Operations & Maintenance Cost <i>(per year)</i></p>	<p>\$250,000</p>
<p>Operations & Maintenance Funding Source(s) <i>(i.e., annual budget, grant, etc. If multiple sources, list each source and the percent or amount funded by each.)</i></p>	
<p>Operations & Maintenance Funding Certainty <i>(i.e., already included in organization's budget, contingent upon grant, etc.)</i></p>	

Part 6. Regional Objectives

Indicate below whether the project meets any of the Kern IRWMP regional objectives. Where necessary/appropriate, please provide a brief explanation as to how the Project meets the regional objective.

Kern IRWMP Objectives	Does the project meet the objective?		Comments/Explanation
	Yes	No	
Increase Water Supply (WS)			
1. Through cooperation and collaboration with other regions restore water supplies to levels that will mitigate for water lost from the region and eliminate overdraft		X	
2. Pursue and implement cost effective water use efficiency programs		X	
3. Increase water storage capacity in the region by increasing recharge acreage and expanding groundwater banking programs before all prime recharge land has been developed		X	
4. Integrate management of water banking facilities to maximize conjunctive use over the planning horizon		X	
5. Increase/augment water supplies to meet region demands		X	
Improve Operational Efficiency (OE)			
1. Increase transfers and exchanges flexibility over the planning horizon	X		Potentially
2. Create tools to re-regulate water supplies within the region, including storage, storm flows, and operational flows over the planning horizon		X	
3. Increase distribution efficiencies and reduce energy usage over the planning horizon	X		
4. Increase the use of alternate energy sources (e.g. solar)	X		
5. Replace aging infrastructure to reduce system water losses, improve operational efficiencies, and reduce service interruptions	X		Wouldn't be reliant on PG&E infrastructure
6. Increase the use of recycled water for direct reuse within the Kern Region		X	
7. Optimize local management of water resources to improve water supply reliability over the planning horizon	X		

8. Increase pool of qualified candidates to operate water and wastewater systems	X	
Improve Water Quality (WQ)		
1. Monitor and/or manage headwaters/areas of origin, natural streams, and recharge areas to prevent or mitigate contamination	X	
2. Identify and preserve prime recharge areas in the Kern fan area and other areas	X	
3. Improve water quality for disadvantaged communities and the watershed over the planning horizon	X	
4. Continue to provide drinking water that meets or exceeds water quality standards; and support efforts to attain appropriate standards throughout the planning horizon	X	
5. Maximize the use of lesser quality water for appropriate uses (landscaping, certain ag crops, “aesthetic” projects) throughout the planning horizon	X	Not maximizing use of lesser quality water, but maximizing use of land in recharge facility
6. Coordinate and enhance aquatic pest control efforts from this point forward	X	
Promote Land Use Planning and Resource Stewardship (LU)		
1. Promote stewardship of the Kern River by applying appropriate measures in various reaches of the river from this point forward	X	
2. Encourage the removal of non-native invasive plant species that affect water quality, reliability, and operations	X	
3. Identify and promote the regeneration and restoration of native riparian habitat	X	
4. Coordinate agricultural and urban water suppliers to more effectively address land use planning issues from this point forward	X	
5. Improve the linkage between land use planning and water supply in the region throughout the planning horizon	X	
6. Increase educational opportunities to improve public awareness of water supply, conservation, and water quality issues throughout the planning horizon	X	Great PR/Educational
7. Improve and coordinate integrated land use planning to support stewardship of environmental resources, such as the Kern River and Kern Fan, and integrate with habitat conservation plans and other ongoing planning efforts from this point forward	X	

8. Preserve and improve ecosystem/watershed health throughout the planning horizon	X	May be a stretch, solar power = less fossil fuels = less air pollution = less air pollution in the watershed and therefore being transferred to the streams/ivers (will assist in addressing climate change...significant?, not likely)
Improve Regional Flood Management (FM)		
1. Improve regional flood management by addressing preparedness, response, and post flood actions throughout the planning horizon	X	
2. Reduce the effects of poor quality runoff throughout the planning horizon		
3. Identify and promote innovative flood management projects to protect vulnerable areas	X	
4. Plan new developments to minimize flood impacts from this point forward	X	



KERN IRWMP

Integrated Regional Water Management Plan

Project Submittal Form

To the extent possible this form should be electronically filled out and e-mailed to:

KernIRWMP@kcwa.com.

Part 1. Lead Implementing Agency/Organizational Information

Please provide the following information regarding the project sponsor and proposed project.

Implementing Agency/ Organization / Individual:

Kern County Water Agency

Agency / Organization / Individual Address:

PO Box 58
Bakersfield, CA 93302-0058

Possible Partnering Agencies:

Name:

Martin Varga

Title:

Engineering and Groundwater Services Manager

Telephone:

(661) 634-1448

Fax:

Email:

mvarga@kcwa.com

Website:

Project Name:

Well-head Arsenic treatment

Either the latitude/longitude or a location description is required. To determine the latitude/longitude, use the closest address or intersection. If the project is linear, use the furthest upstream latitude/longitude.

Project Latitude:

Project Longitude:

Location Description:	various locations where there is need
------------------------------	---------------------------------------

Regional Grouping: Identify the Regional Grouping your *agency* is located in, and the Regional Grouping your *project* is located in.

<input type="checkbox"/> Agency <input type="checkbox"/> Project	Greater Bakersfield
<input type="checkbox"/> Agency <input checked="" type="checkbox"/> Project	Kern County
<input checked="" type="checkbox"/> Agency <input type="checkbox"/> Project	Kern County Water Agency
<input type="checkbox"/> Agency <input type="checkbox"/> Project	Kern Fan
<input type="checkbox"/> Agency <input type="checkbox"/> Project	Kern River Valley
<input type="checkbox"/> Agency <input type="checkbox"/> Project	Mountains/Foothills
<input type="checkbox"/> Agency <input type="checkbox"/> Project	North County
<input type="checkbox"/> Agency <input type="checkbox"/> Project	South County
<input type="checkbox"/> Agency <input type="checkbox"/> Project	West Side

Project Cooperating Agency(ies)/Organization(s)/Individual(s):

•
•
•
•

Project Status (e.g., new, ongoing, expansion, new phase):

new

Part 2. Project Need

It is important to understand the need(s) or issue(s) that the proposed project will address and the benefits that it will provide. Information provided in this section defines the need(s) or issue(s) that the proposed project will address and will help to catalog existing need(s) or issue(s) in the Tulare Lake Basin Portion of Kern County Region.

Please provide a 1-2 paragraph description of the need(s) or problem(s) that the project will address. As applicable, discuss the water supply need, operational efficiency need, water quality need, or resource stewardship need (e.g. ecosystem restoration, floodplain management) need. Discuss critical impacts that will occur if the proposal is not implemented.

There are many locations across California where the groundwater contains naturally high concentrations of arsenic. Many public water supply systems across the United States obtained their water supply from groundwater that had met the old 50 ug/L arsenic standard but exceeded the new 10 ug/L MCL. These utilities searched for either an alternative supply or an inexpensive treatment method to remove the arsenic from their water. In California, an estimated 38% of water-supply wells were put out of compliance by the new regulation. A viable arsenic treatment technology could remove the primary obstacle to using the local groundwater, and thus reduce reliance on imported surface water.

Part 3. Project Description

A general description of the proposed project is needed. This section will provide information associated with the project concept, general project information, and readiness to proceed. It is recognized that much of the requested information may not be available for projects that are at a conceptual level of project development. We appreciate and need your ideas.

Please provide a 1-2 paragraph description of the project including the general project concept, what will be constructed/implemented, how the constructed project will function, and treatment methods, as appropriate.

<p>Arsenic treatment technology would be used utilizing pressure filtration with ferric chloride added as a coagulant to the water before it enters a set of parallel pressure filters containing conventional sand and anthracite. This would include 6 pressure filter vessels, each one 12-ft in diameter. The media depth housed in each filter vessel would be 50 inches deep and contain 20 inches of sand and 30 inches of anthracite. The ferric chloride dose would be between 12 and 20 mg/L, depending on water quality analysis results. The plant would be 5-10.5 MGD in capacity, and it would cost about \$8-\$10 million for all engineering and construction.</p>
--

If applicable, list surface water bodies and groundwater basins associated with the proposed project:

<ul style="list-style-type: none">• San Joaquin Valley Groundwater Basin, Sub-basin Kern County
<ul style="list-style-type: none">•
<ul style="list-style-type: none">•
<ul style="list-style-type: none">•

Please identify up to three available documents which contain information specific to the proposed project:

<ul style="list-style-type: none">•
<ul style="list-style-type: none">•
<ul style="list-style-type: none">•

Is the proposed project an element or phase of a regional or larger program?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
If yes, please identify the program	_____	
Design life of the Project		
Proposed Construction/Implementation Start Date:	_____	
Proposed Construction/Implementation Completion Date	_____	
Ready for Construction Bid	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> NA

Item	Status (e.g., not initiated, in process, complete)	Date
Conceptual Plans	<u>In process</u>	(mm/dd/yyyy)
Land Acquisition/ Easements	<u>Not initiated</u>	(mm/dd/yyyy)
Preliminary Plans	<u>In process</u>	(mm/dd/yyyy)
CEQA/NEPA	<u>Not initiated</u>	(mm/dd/yyyy)
Permits	<u>Not initiated</u>	(mm/dd/yyyy)
Construction Drawings	<u>Not initiated</u>	(mm/dd/yyyy)

For projects that do not include construction, please briefly describe the project readiness-to proceed.

Part 4. Project Benefits

Please provide a 1-2 paragraph description of the benefit(s) that the project will address. Information provided will be used in the assessment of project benefits.

<p>Utilizing arsenic treatment options would increase water supply, potentially making Kern County less reliant on imported surface water.</p>
--

Please describe the dominant existing land use type for the proposed project location.

Existing or new water wells, any land use type
--

Please describe the dominant existing land use type for areas upstream and downstream of the proposed project location
Upstream:
Downstream:

Does the project address any known environmental justice issues?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Sure

Is the project located within or adjacent to a disadvantaged community?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Sure

Does the project include disadvantaged community participation?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Sure
If yes, please identify the group or organization: _____

Please provide the following project benefit information for all applicable components of the proposed project. Benefit categories include things such as water quality / flood management, water supply, and resource stewardship. PLEASE ATTEMPT TO SUPPLY ALL INFORMATION RELEVANT TO YOUR PROJECT. THIS INFORMATION WILL BE USED TO ANALYZE AND ASSESS PROJECT FOR FUTURE FUNDING.

WATER QUALITY BENEFITS / FLOOD MANAGEMENT BENEFITS

Water Quality Benefit Information	
Treatment technologies	<u>Pressure filtration with ferric chloride added as a coagulant to the water before it enters a set of parallel pressure filters containing conventional sand and anthracite</u>
Design operational treatment capacity (million gallons/day)	<u>5-10.5 MGD capacity</u>
Targeted Contaminants (Check all that apply):	
<input type="checkbox"/> Chloride <input type="checkbox"/> Nitrogen Compounds <input type="checkbox"/> Coliform Bacteria <input checked="" type="checkbox"/> Other (describe): <u>Arsenic</u>	
Flood Management Benefit Information	
Maximum volume of temporary storage of storm runoff (acre-feet)	_____
Maximum increased conveyance capacity (cubic feet/second)	_____
Estimated area benefiting from flood damage reduction (acres)	_____
Estimated level of flood protection resulting from project implementation	_____
Estimated annual value of flood damage reduction provided by project (\$/year)	_____
Acreage required for project implementation	_____

WATER SUPPLY BENEFITS

Project information provided will help to quantify water supply benefits from enhanced local water supply or reduced potable water demand.

Enhanced Water Supply or Demand Reduction Benefit Information			
Source of Increased Supply or Demand Reduction			
<input checked="" type="checkbox"/> Groundwater	<input checked="" type="checkbox"/> Groundwater treatment	<input type="checkbox"/> Increased surface water storage	
<input type="checkbox"/> Recycled water	<input type="checkbox"/> Conservation/ water use efficiency	<input type="checkbox"/> Ocean desalination	
<input type="checkbox"/> Transfer	<input type="checkbox"/> Other (describe): _____		
Type of enhanced supply or demand reduction: _____			
Annual Yield of Supply (acre-feet): <u>5600</u>			
Availability by Water-Year Type (acre-feet per year):			
Average Year	<u>5600</u>		
Dry Year	<u>5600</u>		
Wet Year	<u>5600</u>		
Availability by Season (check all that apply):			
<input checked="" type="checkbox"/> Summer	<input checked="" type="checkbox"/> Fall	<input checked="" type="checkbox"/> Spring	<input checked="" type="checkbox"/> Winter
Does the project have the potential to displace demands on the Bay/Delta/Estuary?			
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Sure	

For projects that include detention and groundwater recharge, please complete the following:

How many acres of land drain into this detention basin? (acres)	_____
Detention Basin area (acres)	_____
Detention basin max. operational depth (ft.)	_____
% of basin covered by wetlands	_____
Soil type	_____
If other than infiltration, identify method (e.g., injection) and recharge (acre-feet/year)	_____
Estimated basin annual inflow (acre-feet/year)	_____
Estimated basin annual outflow (acre-feet/year)	_____

RESOURCE STEWARDSHIP BENEFITS

Project information provided will help to quantify the benefits associated with projects related to resource stewardship and land management.

Non-treatment wetland area (acres)	_____
Treatment wetland area (acres)	_____
Riparian habitat area (acres)	_____
Non-developed open space area (acres)	_____
Multiple use/ recreation area (acres) – additionally, select the type of multiple use / recreation and associated acres by type:	
Single Sport Athletics	_____
Multiple Sport Athletics Acres	_____
Other Recreation Acres	_____
Pedestrian Trail Acres	_____
Equestrian Trail Acres	_____
Other Passive Activity	_____
Other Acres (describe)	_____
Description	_____
Total Project area (acres)	_____

Part 5. Project Cost Estimate

Project cost information is needed to assist in comparing benefits and cost. Additionally, knowledge of the project type and cost will assist in identifying funding sources for potential projects.

Please indicate the estimated costs of project implementation and associated funding source(s). These costs should include land purchase/easement, planning/design/engineering, construction/implementation, environmental compliance, administration, and contingency.

<p>Approximate Total Cost <i>(If project costs are variable, please include lower and upper range estimates.)</i></p>	<p>\$8,000,000 to \$10,000,000</p>
<p>Funding Source <i>(If multiple sources, list each source and the percent or amount funded by each)</i></p>	
<p>Funding Certainty & Longevity</p>	
<p>Operations & Maintenance Cost <i>(per year)</i></p>	
<p>Operations & Maintenance Funding Source(s) <i>(i.e., annual budget, grant, etc. If multiple sources, list each source and the percent or amount funded by each.)</i></p>	
<p>Operations & Maintenance Funding Certainty <i>(i.e., already included in organization's budget, contingent upon grant, etc.)</i></p>	

Part 6. Regional Objectives

Indicate below whether the project meets any of the Kern IRWMP regional objectives. Where necessary/appropriate, please provide a brief explanation as to how the Project meets the regional objective.

Kern IRWMP Objectives	Does the project meet the objective?		Comments/Explanation
	Yes	No	
Increase Water Supply (WS)			
1. Through cooperation and collaboration with other regions restore water supplies to levels that will mitigate for water lost from the region and eliminate overdraft		X	
2. Pursue and implement cost effective water use efficiency programs		X	
3. Increase water storage capacity in the region by increasing recharge acreage and expanding groundwater banking programs before all prime recharge land has been developed		X	
4. Integrate management of water banking facilities to maximize conjunctive use over the planning horizon		X	
5. Increase/augment water supplies to meet region demands	X		
Improve Operational Efficiency (OE)			
1. Increase transfers and exchanges flexibility over the planning horizon	X		Potentially
2. Create tools to re-regulate water supplies within the region, including storage, storm flows, and operational flows over the planning horizon		X	
3. Increase distribution efficiencies and reduce energy usage over the planning horizon		X	
4. Increase the use of alternate energy sources (e.g. solar)		X	
5. Replace aging infrastructure to reduce system water losses, improve operational efficiencies, and reduce service interruptions		X	
6. Increase the use of recycled water for direct reuse within the Kern Region		X	
7. Optimize local management of water resources to improve water supply reliability over the planning horizon	X		

8. Increase pool of qualified candidates to operate water and wastewater systems	X	Would require water operators to run, more jobs for qualified personnel
Improve Water Quality (WQ)		
1. Monitor and/or manage headwaters/areas of origin, natural streams, and recharge areas to prevent or mitigate contamination	X	Directly mitigate arsenic contamination
2. Identify and preserve prime recharge areas in the Kern fan area and other areas	X	
3. Improve water quality for disadvantaged communities and the watershed over the planning horizon	X	Potentially
4. Continue to provide drinking water that meets or exceeds water quality standards; and support efforts to attain appropriate standards throughout the planning horizon	X	
5. Maximize the use of lesser quality water for appropriate uses (landscaping, certain ag crops, “aesthetic” projects) throughout the planning horizon	X	Potentially
6. Coordinate and enhance aquatic pest control efforts from this point forward	X	
Promote Land Use Planning and Resource Stewardship (LU)		
1. Promote stewardship of the Kern River by applying appropriate measures in various reaches of the river from this point forward	X	
2. Encourage the removal of non-native invasive plant species that affect water quality, reliability, and operations	X	
3. Identify and promote the regeneration and restoration of native riparian habitat	X	
4. Coordinate agricultural and urban water suppliers to more effectively address land use planning issues from this point forward	X	
5. Improve the linkage between land use planning and water supply in the region throughout the planning horizon	X	
6. Increase educational opportunities to improve public awareness of water supply, conservation, and water quality issues throughout the planning horizon	X	Great PR/Educational
7. Improve and coordinate integrated land use planning to support stewardship of environmental resources, such as the Kern River and Kern Fan, and integrate with habitat conservation plans and other ongoing planning efforts from this point forward	X	

8. Preserve and improve ecosystem/watershed health throughout the planning horizon	X	
Improve Regional Flood Management (FM)		
1. Improve regional flood management by addressing preparedness, response, and post flood actions throughout the planning horizon	X	
2. Reduce the effects of poor quality runoff throughout the planning horizon	X	
3. Identify and promote innovative flood management projects to protect vulnerable areas	X	
4. Plan new developments to minimize flood impacts from this point forward	X	