

# Proposal Full View

## Applicant Information

Organization Name  \*

Tax ID **481273390**

Proposal Name Salton Sea Farms: ISAS Discovery Center \*

Proposal Objective Benefits to Salton Sea: The benefits which the ISAS Discovery Center Project will bring: • Employment creation • Industry diversification • Increased exports • Increased food security • Reduced water scarcity  
 Socio-Economic Benefits: • Biofuel production • Productive desert land utilization • Stemming rural-to-urban migration • Environmental enhancement • Increased foreign direct investment \*

## Budget

Other Contribution	<input type="text" value="\$0.00"/>	
Local Contribution	<input type="text" value="\$0.00"/>	
Federal Contribution	<input type="text" value="\$0.00"/>	
Inkind Contribution	<input type="text" value="\$0.00"/>	
Amount Requested	<input type="text" value="\$1,000,000.00"/>	*
Total Project Cost	<input type="text" value="\$1,000,000.00"/>	*

## Geographic Information

Latitude \* DD(+/-)  MM  SS

Longitude \* DD(+/-)  MM  SS

Longitude/Latitude Clarification 33° 30'17.86"N  
 116° 4'58.99"W

Location North West Shore of the Salton Sea

County Riverside \*

Ground Water Basin Coachella Valley-Indio

Hydrologic Region Colorado River

Watershed 181

## Legislative Information

Assembly District 80th Assembly District \*

Senate District  
US Congressional District

40th Senate District \*  
District 40 (CA) \*

## Project Information

Project Name

Salton Sea Farms: ISAS Dis

Implementing Organization	H2O Futures
Secondary Implementing Organization	So Others May Eat
Proposed Start Date	1/1/2013
Proposed End Date	4/1/2014
Project Scope	1.Seawater Rivers and Canals 2.Aquaculture Ponds 3.Agriculture Fields 4.Productive Wetlands 5.Salt Production 6.Research Lab

Project Description

Aquaculture: Ponds are situated in two banks running parallel to the coast. These unlined natural ponds will be comprised of shrimp cultivation, fin fish, sea cucumbers, other indigenous aquatic animal cultivation and macroalgae. Ponds will be supplied by Salton Sea water, controlled by gates and weirs which may be remotely operated and contain sensors for monitoring and documentation of water level, flow rate and operational times. Nutrient-rich drainage water from the ponds will be collected and delivered to higher elevation canals within the system that supply higher-elevation fields planted with Salicornia. This allows gravity-fed irrigation by flooding with nutrient-rich seawater effluent from the aquaculture production units. The seawater is filtered by the plants and flows downhill where it is collected in common drainage canals and delivered to mangroves and wetlands to be filtered again. Agriculture: Salt-tolerant *Salicornia bigelovii* provides the system's primary commercial crop. This plant is remarkable on several accounts. As a feed crop, it is highly nutritious and a delicious product for human consumption. The seed may be dried and used as a source of flour. The residual biomass of the crop may be dried and used as a feed source component for animals, including the shrimp and fin fish. This biomass may also be compressed and used to make fire logs or building materials such as particle board or straw bales for highly insulated building construction. It may also be pyrolysed, and the pyrolysis oil used for

	<p>electricity generation, or for further processing to make biodiesel and biojet fuel. Additionally, planting it builds soil to which it adds carbon while removing atmospheric carbon. Finally, the highest value Salicornia component (per ton of product) is the oil derived from crushing the seed. This oil may be used as a high grade vegetable oil or a high quality biofuel feedstock.</p>
<p>Project Objective</p>	<p>Benefits to Salton Sea: The benefits which the Red Sea Project will bring to Egypt are plentiful. Amongst other things, the Red Sea Project will lead to: • Employment creation • Industry diversification • Increased exports • Increased food security • Reduced water scarcity Socio-Economic Objectives: • Biofuel production • Productive desert land utilization • Stemming rural-to-urban migration • Environmental enhancement • Increased foreign direct investment</p>

**Project Benefits Information**

Project Benefit Type	Benefit Type	Measurement	Description
Primary	Land Restoration	7	create new habitat
Secondary	Water Restoration	7	Bio-filter salton sea water through plants and animals and return to sea with less saline and selenium content
Tertiary	Climate Change Impacts	0	we hope to prove that use of this technology around the world will be a major source of food, bio-fuel and

			carbon sequestration
Quaternary	Clean Air	1	through enrichment of sand and creation of high quality soil we can keep dust from blowing in the local area

Project Objective

**Budget**

Other Contribution	<input type="text" value="0"/>
Local Contribution	<input type="text" value="0"/>
Federal Contribution	<input type="text" value="0"/>
Inkind Contribution	<input type="text" value="0"/>
Amount Requested	<input type="text" value="1000000"/>
Total Project Cost	<input type="text" value="1000000"/>

**Geographic Information**

Latitude DD(+/-)	<input type="text" value="33"/>	MM	<input type="text" value="30"/>	SS	<input type="text" value="17"/>
Longitude DD(+/-)	<input type="text" value="116"/>	MM	<input type="text" value="4"/>	SS	<input type="text" value="58"/>
Longitude/Latitude Clarification	<input type="text" value="33°30"/>	Location	<input type="text" value="North West Shore"/>		

County Riverside Ground Water Basin Coachella Valley-Indio Hydrologic Region Colorado River WaterShed

**Legislative Information**

Assembly District	80th Assembly District
Senate District	40th Senate District
US Congressional District	District 40 (CA)

**Section : Project General Information Questions**

**Q1 - Project Type**

Select the project type from the dropdown list.

Research

## Q2 - Project Description

**Briefly summarize the proposed project (4,000 characters limit). Include the following information: project goals and objectives, project location, proposed work to be funded, proposed approach (overview of techniques and methods), anticipated timeframe, and anticipated benefits.**

6.2 The ISAS? Discovery Center Project (6 ha = 15 acres): The ISAS? IDC has an anticipated investment cost of US \$1.0 Million As explained above, the expenditure of these funds will not be a short term proposition, with all project infrastructure and staff eventually being incorporated into The ISAS Launch project and eventually Phase I and Phase II of the Salton Sea Farms Project. This project will create 50 jobs. 20 direct employment opportunities and 30 indirect employment opportunities.

ISAS? is unlike traditional biofuel and food production systems, both of which require significant freshwater resources and arable land. Rather, an ISAS? is a completely closed loop, fully integrated system that combines untreated seawater with arid, desert lands to facilitate the practice of aquaculture and agriculture, yielding biofuels, food and other products. Simply put, a series of manmade seawater rivers and canals are used for aquaculture operations, the effluent from which is then used as a natural fertilizer for halophyte-based (i.e. naturally salt tolerant plants such as Salicornia and mangroves) agriculture operations. Collectively, these interdependent aquaculture and agriculture operations yield biofuels (liquid and solid), vegetable oil, seafood (shrimp, fish and sea cucumbers) and a host of coproducts including biomass, protein meal, animal feed and salt.

## Q3 - Applicant Contact Information

**Provide contact information (name, organization, phone number, and address) for the individual who would be the primary contact regarding the grant proposal.**

H20 Futures Ned Daugherty, Principal 2845 Nimitz Blvd. Suite i San Diego, CA. 92106  
ndaugherty@h20futures.net 619.225.2337

## Q4 - Project Team Qualifications

**Identify and describe your project team, including any partnerships with nonprofit groups, citizens' groups, non-governmental organizations, and public or governmental agencies.**

**Identify the proposed Project Manager/Principal Investigator (PM/PI) and key staff as well as the corresponding roles of team members. Provide a brief biographical summary for the PM/PI and each of the key staff members. An organization chart and copies of resumes can be entered in subsequent fields.**

Non-profit Partnership: So Others May Eat So Others May Eat is a not for profit agency a 501(C)(3) in the State Of California that provides food and advocacy for the homeless and disabled in the coastal communities in the county of San Diego. Our goal is to help the homeless obtain housing and other services with dignity and respect. Other partnerships include: The Seawater Foundation: Founded in 1977 as a nonprofit organization in an attempt to alleviate some of the world?s most complex ecological problems through a unique approach which draws seawater inland, irrigating otherwise barren coastal desert regions and turning them green. The Seawater Foundation has spent several decades in research and basic implementation of seawater agriculture and aquaculture technologies and the development of ISAS?. It continues to pursue new research along the same fronts, and to use

seawater to plant forests of mangroves and other appropriate halophytes for carbon sequestration. It has always been the belief of the Seawater Foundation and its supporters that for environmental efforts to make a difference, they must also be economic successes. And for business to flourish in the 21st century, they must take planetary environmental enhancement as part of their "bottom line". New Nile Co: NNC is a start-up company intended to develop and operate ISAS projects throughout the world, commencing with the Red Sea Project in Egypt (presently under development). NNC's promoters are a consortium of for-profit and non-profit organizations: Energy Allied International, The Seawater Foundation and Global Seawater, Inc. collectively; they include agriculturalists, aquaculturists, hydrologists, economists, analysts, accountants, physicists, engineers, architects, landscapists and lawyers. Spanning nine cities, five countries and four continents, this extraordinary group of professionals, each with a unique skill-set, complement one another and make possible the realization of New Nile Co.

## Q5 - Related Experience

**Describe your experience with completing this type of project or similar projects within the scheduled timeframe and within the allowable budget. Provide a description of recently completed or ongoing projects that support your team's ability to perform the proposed work.**

Edwin F. Daugherty, Licensed Architect, Registered Landscape Architect Mr. Daugherty is President and CEO of H2O FUTURES, an international design consulting firm. He has over 30 years of professional experience in environmental planning and design, His particular expertise is applied seawater-related landscape technologies and natural, on-site waste water treatment systems. Mr. Daugherty serves as a lecturer in design and landscape architecture and has been a featured speaker at symposia and technical conferences. Norm Allenby, LLB, Onsite Water Treatment Mr. Allenby is President of Onsite Water Treatment, Inc. Since the mid nineties he has been involved with ecologically designed systems for the on-site treatment of wastewater from individual homes, commercial facilities and subdivisions. The technologies, addressing the shortcomings of centralized treatment, save energy, nutrients and water. Mr. Allenby is a retired trial lawyer and presently a part-time mediator in San Diego, California. He is a graduate of Yale University and the University of Denver College of Law. Tershia d'Elgin, Director of Projects Ms. d'Elgin is a watershed advocate, habitat-restoration project manager, and author. She has distinguished herself as a fundraiser and community organizer, specializing in water conservation and water quality improvements. Her expertise includes political outreach, resource and health agency interaction, stewarding projects through permitting, and marketing. D'Elgin's numerable recognitions include two U.S. Congressional awards. Hany Elwany, Ph.D., Engineer, Oceanographer and Coastal Engineer Dr. Elwany's firm, Coastal Environments, has extensive experience with near-shore oceanography, coastal processes, coastal engineering, and estuarine dynamics. His global projects include in-depth studies for Venice, Italy, and for Nile Delta erosion since construction of the Aswan Dam. He was principal investigator for San Onofre's physical oceanographic program, one of the largest environmental studies ever conducted on the U.S. West Coast. Dr. Elwany is a professor at Scripps Institution of Oceanography. Barney P. Popkin, Cal/PG & REA, CHMM, EuroGeol, ex-BRAC contractor, Hydrologist Mr. Popkin has worked on water, wastewater, solid and hazardous waste, and environmental projects throughout the U.S. and worldwide. A former USGS Hydrologist, he is a California Registered Environmental Assessor and Geologist. Mr. Popkin completed PhD course work in Soil and Water Science (University of Arizona), and an MS in Hydrology (University of Arizona), BA in Geology (New York University), and certificates (honors) in Solid Waste, Hazardous Waste, and Business Management (University of California, Berkeley). Chris Stransky, M.S., AMEC Earth & Environmental, Water and Sediment Quality Assessment Mr. Stransky has extensive project management, field collection, testing, analysis, and reporting experience for environmental programs of every size. He is versed in all

aspects of performing and interpreting chemical and toxicological tests under regulatory and research institution guidelines. Mr. Stransky holds his M.S. in Marine Ecology from San Diego State University. Jason Benjamin Smith, Visual Communications Mr. Smith is a visual communications specialist working at the intersection of culture and ecology. With a diverse skill set in resource conservation and international studies, he has been involved in sustainable development and socially responsible travel in over 30 countries. As a photographer and multimedia producer, Mr. Smith works with corporate and nonprofit partners to promote and implement environmental education, stewardship and economic restoration.

## Section : Habitat Creation And Enhancement Project

Project Specific - Habitat Creation And Enhancement Project

### Q6 - Project Type

**Is your Project a Habitat Creation and Enhancement type of project? If it is go to question #2 of this section. If not, go to the appropriate project type section to complete your application.**

- 1)  Yes  
 2)  No

### Q7 - Project Goals and Objectives

**State the habitat restoration goals and objectives of the proposed project. These should be simple, objective statements about what the proposed project seeks to accomplish over the near and long term. The objectives should be measureable and consistent with the Program goals identified in the guidelines. Include a description of performance metrics that could be used to measure the effectiveness in achieving the stated goals and objectives.**

Benefits to Salton Sea: ? Employment creation ? Industry diversification ? Increased exports ? Increased food security ? Reduced water scarcity Socio-Economic Benefits: ? Biofuel production ? Productive desert land utilization ? Stemming rural-to-urban migration ? Environmental enhancement ? Increased foreign direct investment

### Q8 - Proposed Habitat Creation or Enhancement

**Describe the habitat proposed for creation or enhancement. Include a description of the anticipated features and characteristics of the created or enhanced habitat (such as acreage, water depth, salinity, vegetation cover) upon completion of project construction as well as the characteristics of the habitat when fully established. Indicate the timeframe for achieving full establishment of the habitat.**

Productive Wetlands--At the lower reaches of the Site, ecologically productive wetlands receive the nutrient- rich drainage from the Salicornia fields, and serve as a biological / mechanical filter for the seawater prior to seeping back to the underlying seawater wedge.

### Q9 - Current Site Conditions

**Describe the current conditions at the site proposed for habitat creation or enhancement and the immediate vicinity. Include information on land ownership and characteristics such as land use, topography, soils and sediments, vegetation, wildlife usage, drainage patterns, contaminants, and any other features pertinent to the proposed project. The description should be sufficient to demonstrate that the site is suitable for the proposed project. Indicate whether the site is occupied by State- or federally listed species or species of special concern. Attach a location map and any photos or figures that illustrate the current condition of the site on the “Site Map and Photos” section of the application under the tab labeled “General Information and Attachments.”**

The proposed site is adjacent to the Travertine Point Development on the Sea's banks, but can be replicated at various points around the Sea. Current land use is underutilized and underdeveloped, resulting in unproductive brownfields. The topography gradually slopes towards the Sea, allowing agricultural runoff of nutrients and contaminants into the Sea. Our system will utilize Sea water as a resource, filtering it as well as other runoff, mitigating contamination and creating cleaner habitat for birds and fish.

#### **Q10 - Proposed Approach**

**Generally describe the approach for implementation of the proposed work. Include information on grading, water conveyance, planting, invasive plant removal, erosion control methods, and other key features of the proposed work. Indicate whether the proposed techniques have been successfully implemented at the Salton Sea or in a similar environment. Demonstrate that the best available science has been incorporated into the design. Attach design drawings and other graphical information related to the design on the “Design Drawings and Figures” section of the application under the tab labeled “General Information and Attachments.”**

**Also attach a Work Plan, Budget, and Schedule as described on the “General Information and Attachments” tab of this application.**

Nutrient-rich seawater from the adjacent Salton Sea is captured and employed in two ways. Firstly, it is brought directly onto the IDC site through a seawater river that meanders from a shoreline inlet and, secondly, naturally filtered underground seawater is pumped to the site surface from an on-shore well. The direct, unfiltered seawater is used for aquaculture production. The mechanically and biologically subsurface filtered seawater from seawater wells, designed to specific standards, is used in research and limited production areas (e.g. hatchery phases, etc.). It is the nutrient laden waste water from these uses that provides irrigation for the Salicornia plantings. The water is brought to the farm plots from the aquaculture in two seawater rivers located at the higher end of the fields. The fields are then flood irrigated and the resulting drainage water collected in a mangrove-lined drainage river that flows to the wetland. Seawater is temporarily retained here, before evaporating, percolating back underground into the seawater wedge, or prior to going to salt crystallization ponds.

#### **Q11 - Project Benefits**

**Describe the anticipated benefits to be provided by the proposed project and explain how the project would further the goals of the Program. Indicate the species that the habitat is intended to support and describe the relative contribution the project would make in supporting the priority fish and wildlife described in the guidelines. If applicable, describe how the proposed project would benefit adjacent habitat or provide connectivity among existing habitats. Also, describe future actions, if any, needed beyond the scope of this project to fully address the overall project goals.**

Project which may be summarized as follows: 1. Proof of applicability of ISASTM technology at the Site- Both potential investors and the Egyptian government at large require a physical assurance that ISASTM technologies are applicable not just to Egypt, but in particular to the selected site. The ISASTM Launch Project achieves this objective and will encourage investors to proceed with an investment in Phase I of the Project. 2. Proof of design concept for the Project- The ISASTM Launch Project is designed as a "miniature" or "compact" version of Phase I of the Project. The purpose is to prove the design concept at this location (as it has been proven in other locations) and substantiate the design rationale to satisfy all concerned parties that the Project's design is both functional and environmentally sound. 3. Direct employment creation for over 300 individuals- The vast majority of staff for the ISASTM Launch Project will be locally sourced from the cities of Indio and Imperial Valley. This means increased employment opportunities, both direct and indirect, for the local residents. 4. Development of a grass roots support campaign with the local communities to support the Project- As a commercial scale agro-industrial project, the Project will be subject to public review and must receive formal endorsement through a town hall meeting, failing which the project will face great difficulty in proceeding. The ISASTM Launch Project will enable the local communities to witness first-hand the great potential socio-economic benefits that an ISASTM project will bring to the communities, thus minimizing future risk associated with endorsement procedures. 5. Training and development for existing and new staff- The ISASTM Launch Project will provide much-needed opportunities to train and develop local staff in the myriad of activities associated with an ISASTM project. This initial, "seed" workforce will constitute the future trainers, managers and developers of the vast workforce required for the Project. 6. Field trials for aquatic species and halophytic varieties- The ISASTM Launch Project will be an invaluable testing facility for the range of species that will be produced by the larger Project, thus ensuring maximized production potential immediately upon commissioning of Phase I. 7. Systems testing and refinement of technical features of the Salton Sea Farms Project- An ISASTM project is a fully integrated, complex "living" structure- a replicated ecosystem. As such, the Salton Sea Farms Project will have a wide array of infrastructure components, all of which will be required to work in harmony with one another to ensure optimized production levels. The ISASTM Launch Project will provide the requisite opportunity to optimize the various technical aspects of the project, thus minimizing operational risk to Phase I of the Salton Sea Farms Project.

#### **Q12 - Operations and Maintenance (O&M)**

**Generally describe how the project would be operated and maintained over time. Include a description of periodic maintenance activities that would be required, an estimate of projected costs, and a description of the frequency and timing of activities such as water management, vegetation management, sediment removal, and other O&M activities relevant to the proposed project. Indicate who would perform long-term maintenance and describe how the O&M would be funded.**

**The applicant will be expected to prepare a detailed O&M Plan for the project, which should be included as a task component of the Work Plan and Budget.**

The IDC will be operated by local staff. The intent is to transfer knowledge in a systematic, methodical and comprehensive manner so that eventually the IDC may be operated wholly locally, thus minimizing costs and maximizing local employment potential for the facility.

#### **Q13 - Monitoring and Adaptive Management**

**Generally identify the areas of scientific uncertainty associated with the project and describe the plan to adaptively manage the habitat to achieve the project goals and objectives. Describe the monitoring that would be conducted to measure performance and inform adaptive management adjustments in the future.**

**The applicant will be expected to prepare a detailed Monitoring and Adaptive Management Plan for the project, which should be included as a task component of the Work Plan and Budget. The plan will be for a minimum of 5 years. Monitoring reports are to be submitted annually to DFG. Funding for implementation of the first 2 years of monitoring under the plan can be included in the applicant's budget. Indicate the funding source for the monitoring and adaptive management beyond the initial 2 years.**

The anticipated uncertainties of the project concern the amounts of selenium that our proprietary strain of *Salicornia* will be able to filter at increasingly larger scales. Monitoring will be conducted by our team (with experience implementing similar projects in both Eritrea, Africa and Baja California, Mexico) as well as locally-trained staff.

#### **Q14 - Phasing**

**Indicate whether and how the proposed work might be phased or reduced if the project is funded at a reduced level. Explain how project benefits and total cost of the project would be affected if portions were deferred to later years. Also, describe the extent to which the proposed habitat could be expanded in the future and the cost effectiveness of those additions.**

**If the proposed work is a continuation of previously completed work, describe the extent to which the continued success of the prior work is dependent upon the proposed work. If the previous work was funded by a State agency, list the project name and year the grant was awarded.**

The ISAS IDC has an anticipated investment cost of US \$1.0 Million. As explained above, the expenditure of these funds will not be a short term proposition, with all project infrastructure and staff eventually being incorporated into The ISAS Launch project and eventually Phase I and Phase II of the Salton Sea Farms Project. This project will create 50 jobs. 20 direct employment opportunities and 30 indirect employment opportunities. The ISAS? Launch Project (200 ha = 500acres): The ISAS?

Launch Project has an anticipated investment cost of US \$10.0 Million. As explained above, the expenditure of these funds will not be a short term proposition, with all project infrastructure and staff eventually being incorporated into Phase I of the Red Sea Project. This project will create 500 jobs. 200 direct employment opportunities and 300 indirect employment opportunities. If project is funded in phases we would create smaller versions of the same systems. We can make it work on a one acre prototype scale but it will put less residents to work, create less habitat and have less impact on the area at large.

#### **Q15 - Availability of Water**

**If the proposed project requires water, describe the water requirements (volume and quality) and identify the source(s). Explain the reliability of the water source and describe how the proposed habitat would be influenced by a temporary reduction or interruption of water supply or changes in water quality. Identify the sources of funding for the water supply.**

Salton Sea Water will be our source.

#### **Q16 - Adjacent Property Impacts**

**Describe how the proposed project might affect adjacent property and landowners. Disclose any known concerns or opposition to the project or land access issues.**

Increase land value and potential sale value. Air quality improvement is also a benefit to neighbors.

### **Q17 - Sustainability and Climate Change**

**Describe the resilience of the proposed habitat to changing conditions, such as higher average temperatures, decrease in the surface elevation of the Salton Sea, and increased salinity in the Salton Sea. Indicate the period of time that the proposed habitat would be functional.**

Sustainability: In the design of the IDC, exceptionally careful analysis is given to the natural features of the site and its context, including among others, topography, hydrology, geology, ecology, climate and social / cultural characteristics. The result of these extensive studies is a design that optimizes all of the key components of an ISASTM project, providing the highest standards of scientific method while meeting or exceeding the ultimate environmental and cultural standards of responsibility.

Climate Challenges: In the twenty-first century, The Salton Sea is faced with an incredible array of challenges which, if not addressed, will create unnecessary and avoidable risks across the ecological and economic spectrum. Fresh water scarcity, food shortages, arable land depletion, staggering unemployment, population explosion and urban congestion are but a few of these challenges. On the global stage, there are equally grand challenges such as global warming, sea level rise and the production of sustainable biofuels.

## **Section : Water Quality Improvement Project**

### Water Quality Improvement Project

### **Q6 - Project Type**

**Is your project a Water Quality Improvement type of project? If it is go to question #2 of this section. If not, go to the appropriate project type section to complete your application.**

- 1)  Yes
- 2)  No

### **Q7 - Project Goals and Objectives**

**State the goals and objectives of the proposed project. These should be simple, objective statements about what the proposed project seeks to accomplish over the near and long term. The goals should be measurable and consistent with the Program goals identified in the guidelines. Include a description of performance metrics that could be used to measure the effectiveness in achieving the stated goals and objectives.**

n/a

### **Q8 - Proposed Water Quality Improvements**

**Describe the proposed water quality improvement project, including physical features of the project, the source and quality of the water to be improved, the water quality issue to be addressed (for example, selenium, nutrients), the anticipated level of improvement, the location of any proposed facilities, the anticipated volume of water with improved quality, the anticipated use of improved water, the amounts and disposition of contaminants removed, and other relevant characteristics of the proposed project. Indicate the timeframe for the project to become fully functional.**

n/a

#### **Q9 - Current Site Conditions**

**If the project requires the construction or installation of facilities, describe the current conditions at the location(s) where the facilities would be installed. Include information on characteristics such as land use, topography, soils, vegetation, wildlife usage, drainage patterns, contaminants, and any other features pertinent to the proposed project location. If the proposed project involves changes in land use practices in the watershed, describe the characteristics of the area affected. Indicate whether the site is occupied by State- or federally listed species or species of special concern.**

**Attach a location map and any photos or figures that illustrate the current condition of the site or area on the “Site Map and Photos” section of the application under the tab labeled “General Information and Attachments.”**

n/a

#### **Q10 - Proposed Approach**

**Generally describe the approach for implementation of the proposed work. As relevant, include information on construction, water conveyance, planting, and other key features of the proposed work. Indicate whether the proposed techniques have been successfully implemented at the Salton Sea or in a similar environment. Demonstrate that the best available science has been incorporated into the approach.**

**If relevant, attach design drawings and other graphical information related to the design on the “Design Drawings and Figures” section of the application under the tab labeled “General Information and Attachments.”**

**Also attach a Work Plan, Budget, and Schedule as described on the “General Information and Attachment” tab of this application.**

n/a

#### **Q11 - Project Benefits**

**Describe the anticipated benefits to be provided by the proposed project and explain how the project would further the goals of the Program. Identify the species or habitats that would benefit from the water quality improvement and describe the relative contribution the project would make in supporting the priority fish and wildlife described in the guidelines.**

n/a

#### **Q12 - Operations and Maintenance (O&M)**

**Generally describe how the project would be operated and maintained over time. Include a description of periodic maintenance activities that would be required, an estimate of projected costs, and a description of the frequency and timing of activities such as water management, vegetation management, sediment removal, and other O&M activities relevant to the proposed project. Indicate who would perform long-term maintenance and describe how the O&M would be funded.**

**The applicant will be expected to prepare a detailed O&M Plan for the project, which should be included as a task component of the Work Plan and Budget.**

n/a

### **Q13 - Monitoring and Adaptive Management**

**Generally identify the areas of scientific uncertainty associated with the project and describe the plan to adaptively manage the project to help ensure that the project goals and objectives are achieved. Describe the monitoring that would be conducted to measure performance and inform adaptive management adjustments in the future.**

**The applicant will be expected to prepare a detailed Monitoring and Adaptive Management Plan for the project, which should be included as a task component of the Work Plan and Budget. Monitoring reports are to be submitted annually to DFG. Funding for implementation of the first two years of monitoring under the plan can be included in the applicant's budget. Indicate the funding source for the monitoring and adaptive management beyond the initial two years.**

n/a

### **Q14 - Phasing**

**Indicate whether and how the proposed work might be phased or reduced if the project is funded at a reduced level. Explain how project benefits and total cost of the project would be affected if portions were deferred to later years. Describe the extent to which the proposed project could be expanded in the future and the cost effectiveness of those additions.**

**If the proposed work is a continuation of previously completed work, describe the extent to which the continued success of the prior work is dependent upon the proposed work. If the previous work was funded by a State agency, list the project name and year the grant was awarded.**

n/a

### **Q15 - Availability of Water**

**Describe the water requirements (volume and quality) and identify the source(s). Explain the reliability of the water source and describe how the proposed project would be influenced by a temporary reduction or interruption of water supply or changes in water quality.**

n/a

### **Q16 - Adjacent Property Impacts**

**Describe how the proposed project might affect adjacent property and landowners. Disclose any known concerns or opposition to the project or land access issues.**

n/a

**Q17 - Sustainability and Climate Change**

**Describe the sustainability of the proposed project and its resilience to change.**

n/a

**Section : Research Project**

Research Project

**Q6 - Project Type**

**Is your project a Research type of project? If it is go to question #2 of this section. If not, go to the appropriate project type section to complete your application.**

1)  Yes

2)  No

**Q7 - Research Goals and Objectives**

**State the goals and objectives of the proposed research project.**

Goals/Objectives: This project addresses the rehabilitation of the Salton Sea and necessary corresponding infrastructures and ancillary programs. From its inception the project will model and test the utilization of the Sea's brackish waters as an agricultural resource in a closed water loop.

Decreasing fresh water supplies can be conserved while new farm typologies address Sea water salinity and selenium levels to rehabilitate existing bird and fish habitats. Further, at the future-envisioned large scale, new industrial agricultural and energy opportunities are created in the region.

**Q8 - Proposed Research**

**Describe the proposed research, the scientific basis, and the questions that the research would investigate. Include any conceptual models that may help clarify the areas of uncertainty. Attach any relevant conceptual models on the "Design Drawings and Figures" section under the "General Information and Attachments" tab.**

The IDC will evolve throughout the course of its operation to address environmental, social and ISAS? operational needs as they arise. However, at the outset, the IDC will launch and operate three primary programs: ISAS? Outreach The ISAS? Outreach initiative will serve multiple critical functions. It will use the IDC as a demonstration facility for government representatives, investors, lenders, grantors, the press, members of the public and other interested parties to witness firsthand the feasibility and full range of opportunities created through an Integrated Seawater Agriculture System. Specifically, the R&D will focus on three primary areas of study: Aquatic Animals: The identification, assessment and rearing of seawater aquatic species suitable for ISAS? production in the Salton Sea region based upon, amongst other things, nutritional attributes and market value. Halophytes: The identification, assessment and cultivation of halophytic species (i.e. naturally salt tolerant plants) for food, fuel and aesthetic beauty (i.e. seawater landscaping) with a view to (a) enhancing palatability, (b) oil yield and (c) the identification and domestication of halophytes for seawater landscaping. System Optimization: The review, assessment and improvement of the various components of which ISAS? is comprised to optimize production yields and sustainability. ISAS? Training & Education: The ISAS? Training & Education initiative will provide faculty, students, Salton Sea Farms staff, IDC staff and other

interested parties with practical training and education with respect to all things ISAS? with the specific mandate of proliferating seawater agricultural methods and ISAS? processes throughout the region. 1.3 IDC Revenue Streams: Although the IDC capital expenditures will be funded exclusively through grants, donations and the like, the IDC annual operating expenditures will be funded through a combination of both grants and donations as well as IDC generated revenues. The IDC Garden will house both a small caf? and gift shop, both of which will generate revenue to off set the IDC annual operating expenditures.

#### **Q9 - Relevance to Program Goals**

**Describe how the proposed research directly relates to the successful creation and maintenance of habitat at the Salton Sea in the near term. Within the context of previous attempts to collect similar information, describe how the proposed research would fill a data gap or provide new information useful to improving existing and future habitat values.**

From its inception the project will model and test the utilization of the Sea?s brackish waters as an agricultural resource in a closed water loop. Decreasing fresh water supplies can be conserved while new farm typologies address Sea water salinity and selenium levels using biofiltration to rehabilitate existing bird and fish habitats.

#### **Q10 - Research Methods**

**Describe the approach and design of the proposed research. Include the initial hypotheses to be tested, anticipated experimental methods, and likely statistical analyses. For research conducted in the field, indicate the locations where work would occur.**

**Attach maps and other graphical information related to the research on the “Design Drawings and Figures” section of the application under the tab labeled “General Information and Attachments.”**

**Also, attach a Work Plan, Budget, and Schedule as described on the “General Information and Attachment” tab of this application.**

Salton Sea Farms will combine the Salton Sea?s abundant resources of desert land, seawater and labor to address many of these national and global challenges through the development and operation of the Salton Sea?s first commercial scale Integrated Seawater Agriculture System (?ISAS?) along the Sea coastline. The pre-cursor to the full-scale ISAS Launch Project is a smaller-scale initial phase project (the ?ISAS Discovery Center?) which will prove and demonstrate the feasible application of ISAS technologies at the selected site. The hypothesis to be tested asks whether this technology might provide water filtration/conservation and carbon sequestration to improve habitat at the Salton Sea while also introducing new agricultural typologies to provide food, energy and jobs to the region.

#### **Q11 - Timeframe**

**Indicate how soon after project initiation the proposed research could provide managers with preliminary interpretations of data that may lead to insight into creation and management of habitats.**

Six months after completion of the Salton Sea Farms ISAS Discovery Center, the Launch Project technology can be tested. The ISAS? Launch Project has an anticipated investment cost of US \$10.0 Million per 500 acres (providing some 500 jobs). As explained above, the expenditure of these funds will not be a short term proposition, with all project infrastructure and staff eventually being incorporated into Phase I of the Project. The ISAS Launch Project?and ultimately Phases I and II of the Salton Sea Farms Project?is planned and designed to have a coordinated array of synergistic

production and processing components. These multiple units are developed in a phased approach, with each designed to be scalable as operations expand. Understanding ISAS: ISASTM is unlike traditional biofuel (which can displace food products) and food production systems that utilize freshwater and arable land. Rather, an ISASTM is a completely closed loop, fully integrated system that combines untreated seawater with arid, desert lands to facilitate the practice of aquaculture and agriculture, yielding biofuels, food and other products. Simply put, a series of manmade seawater rivers and canals are used for aquaculture operations, the effluent from which is then used as a natural fertilizer for halophyte-based (i.e. naturally salt tolerant plants such as Salicornia and mangroves) agriculture operations. Collectively, these interdependent aquaculture and agriculture operations yield biofuels (liquid and solid), vegetable oil, seafood (shrimp, fish and sea cucumbers) and a host of co-products including biomass, protein meal, animal feed and salt. The technologies underlying ISASTM have been proven to be sustainable for over thirty years in Mexico and are supported by leading scientific authorities including Dr. Nina Fedoroff, President of the American Association for the Advancement of Science (former US Secretary of State's Science & Technology Adviser) and Dr. Mohamed El Raey, one of Egypt's most renowned environmental physicists. Moreover, ISASTM has been demonstrated effectively in the east African nation of Eritrea.

### Q12 - Phasing

**Indicate whether and how the proposed work might be phased or reduced if the project is funded at a reduced level. Explain how project benefits and total cost of the project would be affected if portions were deferred to later years.**

The work can be completed in phases but full economic returns will be realized at larger scales.

### Q13 - Benefits of the Research

**Describe the anticipated benefits to be provided by the proposed research and explain how the results would further the goals of the Program. Indicate the species that would ultimately benefit from the work and describe the relative contribution the project could make in supporting the priority fish and wildlife described in the guidelines.**

Migratory birds and endangered fish species will benefit from reduced salinity and selenium levels. Biofiltration systems will provide the action by which filtration occurs, with minimal disruption to native and migratory species.

## Section : Adaptive Management Experimentation Project

### Adaptive Management Experimentation Project

### Q6 - Project Type

**Is your project an Adaptive Management Experimentation type of project? If it is go to question #2 of this section. If not, go to the appropriate project type section to complete your application.**

- 1)  Yes
- 2)  No

### Q7 - Adaptive Management Goals

**State the goals and objectives of the proposed adaptive management experiment. These should be simple, objective statements about what the proposed work seeks to accomplish over the near and long term. The goals should be measureable and consistent with the Program goals identified in the guidelines. Include a description of performance metrics that would be used to measure the effectiveness in achieving the stated goals and objectives.**

n/a

#### **Q8 - Proposed Experiment**

**Describe the proposed adaptive management experiment. Include a description of the habitat or management practices that would be manipulated for the purposes of the experiment and the timeframe over which the experiment would be conducted. Describe the rationale for the proposed experiment, including the scientific basis and any conceptual models that help clarify the areas of uncertainty.**

**Attach any relevant conceptual models on the “Design Drawings and Figures” section under the “General Information and Attachments” tab. Indicate the timeframe for the project to become fully functional.**

n/a

#### **Q9 - Current Site Conditions and Management**

**Identify the owners and land managers of the site where the proposed work would be conducted. Describe the current conditions at the site proposed for the experiment, including information on the physical characteristics pertinent to the proposed project. Describe how the site is managed, with particular attention to management actions that may be modified as a result of the experiment. Indicate whether the site is occupied by State- or federally listed species or species of special concern.**

**Attach a location map and any photos or figures that illustrate the current condition of the site on the “Site Map and Photos” section of the application under the tab labeled “General Information and Attachments.”**

n/a

#### **Q10 - Proposed Approach**

**Describe the approach for implementation of the proposed work. Include information on the study design, monitoring requirements, and a description of how management would be adapted as a result of project outcomes. Also, describe the extent of any additional activities at the site needed to accommodate the experiment, such as earthwork, installation of water conveyance structures, planting, invasive plant removal, erosion control, and other key actions of the proposed work. Indicate whether the proposed techniques have been successfully implemented at the Salton Sea or in a similar environment.**

**Attach design drawings and other graphical information related to the experiment on the “Design Drawings and Figures” section of the application under the tab labeled “General Information and Attachments.”**

**Also attach a Work Plan, Budget, and Schedule as described on the “General Information and Attachment” tab of this application.**

n/a

**Q11 - Project Benefits**

**Describe the anticipated benefits to be provided by the proposed project and explain how the project would further the goals of the Program.**

n/a

**Q13 - Phasing**

**Indicate whether and how the proposed work might be phased or reduced if the project is funded at a reduced level. Explain how project benefits and total cost of the project would be affected if portions were deferred to later years.**

n/a

**Q13 - Availability of Water**

**If the proposed project requires additional water, describe the water requirements (volume and quality) and identify the source(s). Explain the reliability of the water source and describe how the proposed project would be influenced by a temporary reduction or interruption of water supply or changes in water quality.**

n/a

**Q14 - Adjacent Property Impacts**

**Describe how the proposed project might affect adjacent property and landowners. Disclose any known concerns or opposition to the project or land access issues.**

n/a

**Section : Attachments Section****Attachments Section****A1 - Authorizing Resolution**

**Attach a scanned copy of a signed resolution or equivalent document from the applicant's governing board or officer authorizing the submittal of this application.**

Last Uploaded Attachments: H20 Flowchart.pdf

**A2 - Applicant Team Organization: Chart**

**Attach an organization chart indicating key staff and their roles relative to the proposed work.**

Last Uploaded Attachments: H20 Flowchart.pdf

**A3 - Resumes/CVs**

**Attach resumes/CVs for the PM/PI and key staff proposed for the project. You can combine all the CVs in one document as long as the individuals are identified.**

Last Uploaded Attachments: H20 Flowchart.pdf

### **A3 - Continued**

**Upload additional CVs and Resumes here if needed.**

Last Uploaded Attachments: H20 Flowchart.pdf

### **A3 - Continued**

**Upload additional CVs and Resumes here if needed.**

Last Uploaded Attachments: H20 Flowchart.pdf

### **A4 - Work Plan**

**Attach a work plan with a task-by-task description of how the proposed work would be conducted and identify the deliverables for each task. The work plan must also identify which costs are being directly funded by the Program.**

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### **A4 - Continued**

**Upload here any additional documents describing the work plan if needed.**

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### **A4 - Continued**

**Upload here any additional documents describing the work plan if needed.**

Last Uploaded Attachments: IDC Proposal - July 2011 - highres-41.jpg

### **A4 - Continued**

**Upload here any additional documents describing the work plan if needed.**

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### **A5 - Budget**

**Attach a budget for the requested funding showing the breakdown of estimated costs of the proposed work by task, including a list of equipment to be purchased as part of the project. The budget should also indicate the total cost of the project and the source of additional funding, if any, including any cash contributions, in-kind services, volunteer effort, maintenance and operation costs, and other grant funding. Please differentiate the grant request from the total project budget and demonstrate how the grant award would be tracked separately. Also, describe the basis for the cost estimates and the methods used to calculate them.**

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**A5 - Continued**

**Upload any additional documents describing the Budget if needed.**

Last Uploaded Attachments: IDC Proposal - July 2011 - highres-43.jpg

**A5 - Continued**

**Upload any additional documents describing the Budget if needed.**

Last Uploaded Attachments: IDC Proposal - July 2011 - highres-43.jpg

**A5 - Continued**

**Upload any additional documents describing the Budget if needed.**

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**A6 - Schedule**

**Attach a schedule for completing the proposed work by task, and indicate significant milestones. This can be submitted in Microsoft Word, Excel, or Project file formats.**

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**A6 - Continued**

**Upload here any additional documents describing the Schedule if needed.**

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**A6 - Continued**

**Upload here any additional documents describing the Schedule if needed.**

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**A6 - Continued**

**Upload here any additional documents describing the Schedule if needed.**

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**A7 - Site Maps and Photos**

**Attach a location map indicating the proposed project and vicinity, and any photos and diagrams that would help illustrate the current condition of the proposed site. Please include a legal description of the project site, if available.**

Last Uploaded Attachments: 3\_Salton Sea Farms\_IDC.jpg

**A7 - Continued**

**Upload any supplemental maps or photos related to the project if needed.**

Last Uploaded Attachments: 0\_salton sea book\_Page\_20.jpg

**A7 - Continued**

**Upload any supplemental maps or photos related to the project if needed.**

Last Uploaded Attachments: 0\_salton sea book\_Page\_16.jpg

**A7 - Continued**

**Upload any maps or photos related to the project if needed.**

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**A8 - Design Drawings and Figures**

**Attach design drawings that depict the proposed habitat creation or enhancement as well as any diagrams or figures that would help illustrate project features and assist in the review of the proposal.**

Last Uploaded Attachments: 0\_salton sea book\_Page\_09.jpg

**A8 - Continued**

**Upload here any supplemental drawings and figures related to the project if needed.**

Last Uploaded Attachments: 15\_rendering c.jpg

**A8 - Continued**

**Upload here any supplemental drawings and figures related to the project if needed.**

Last Uploaded Attachments: 2\_Salton Sea Farms \_launch site.jpg

**A8 - Continued**

**Upload here any supplemental drawings and figures related to the project if needed.**

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**A9 - Letters of Support**

**Attach any letters or other evidence from local entities indicating support for the proposed project.**

Last Uploaded Attachments: H2O Futures support letter.pdf

**A9 - Continued**

**Upload any letters of support you may have received.**

Last Uploaded Attachments: IVEDC Letter of Support.pdf,120910\_NAG\_SaltonSea.pdf,Letter of

support SDSU.pdf

**A10 - Operation and Maintenance Plan**

**Upload your Operation and Maintenance plan if needed.**

Last Uploaded Attachments: IDC Proposal - July 2011 - highres-47.jpg

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