Florida State University

2015 GAP Proposals Guide

Office of Research

A Guide to Participating in the FSU GAP Program

Welcome to the Florida State University Research Foundation GAP (Grant Assistance Program). GAP was established in 2006 by the FSU Research Foundation as a funding mechanism to help FSU researchers transfer their work from the laboratory into the commercial market. GAP is a competitive process that asks FSU researchers to document the current status of one of their projects and assess what further efforts and results it would take to make that project a possible commercial success. The winners of the GAP grant will be those researchers who can most clearly identify the commercial viability of a product, process or license that they believe will come from their efforts.

We have assembled a group of local business executives who sit as the GAP board. This group has a tremendous amount of expertise and experience in the area of business development. This group will judge the merits of each GAP proposal based on the perceived chance to develop a commercially viable product based on research. They will then award GAP funding based on those findings.

After the GAP competition is completed, each GAP winner will be assigned a team of local business leaders as mentors. This group will meet on a quarterly basis to provide insight and assistance to the GAP winners in the area of product development. We have found this to be a very rewarding process for both the FSU researchers and the mentors who can share their expertise.

In this document, you will find the required elements needed to complete a GAP nomination. As you will quickly see this is not the typical submission most researchers normally use to apply for a grant. The GAP process focuses not so much on the science of a discovery but more on the applicability of that discovery as a commercially viable entity. As you will also see the required elements needed to apply for a GAP award are very streamlined and should not require undue time and effort on the part of the FSU researcher.

One of the elements required for a GAP submission is the inclusion of letters of interest from commercial groups who have expressed interest the inventors' work. You probably have existing outside commercial groups with whom you have had contact pertaining to your work. This is a great place to find companies who might want to have a stake in future development efforts based on the work in your GAP proposals. If you need help in identifying possible commercial partners, please contact the FSU Office of Commercialization for ideas about who might fit this bill.

We have included a checklist of all of the necessary elements to comprise a completed GAP nomination. Also included is a schedule of events for this cycle of the GAP competition. Once the competition is completed, winners will be notified within a week and funding will be made available shortly thereafter. This will allow the winners to quickly make plans for the use of this funding, including the hiring commitment of Grad and Post Grad researchers.

To aid in your efforts in producing your GAP proposal, we have included for your review a complete GAP nomination package done for a "mythical" FSU research project called "*Fresh Water on Demand*." This project has no relation in fact to any known work being done at FSU. We included this document to serve as a model for new GAP nominations showing the areas that should be covered by a researcher completing a GAP proposal. We hope that this sample GAP proposal will help you in your efforts as you participate in the GAP process.

In addition, our staff has developed a technology review of the disclosure you the FSU researcher have made to our department. This was done in an effort to try and evaluate the competitive nature of your disclosure to other work being done in your area of expertise. Past GAP participants have found this information very useful as they proceeded with the GAP process.

Also included in the package is a listing of the Commercialization staff. We are here to help you during the GAP proposal process. Please do not hesitate to ask for our assistance as you build your GAP proposal submission.

GAP is a great investment by FSU for the future of research and development at our university. We look forward to this round of the competition and the many new and exciting opportunities it will bring.

Spring 2015 GAP – Competition Checklist

Required Elements of a GAP Nomination

1. A completed overview of the proposed project as described in the "*Fresh Water on Demand*" sample, including:

    a. Description of the problem to be solved
    b. Potential solution
    c. Novel technology
    d. Picture/diagram of the potential product
    e. Target market overview
    f. Letters of interest from potential commercial partners

2. Completion of the Work plan:
    a. Activities
    b. Failure points
    c. Costs

3. Inclusion of FSU Form # DSR 1 (http://www.research.fsu.edu/contractsgrants/forms.html)

4. PowerPoint Presentation (limited to 10 minutes)

5. Participate in a "practice" presentation

6. Present proposal to GAP committee

Spring 2015 GAP - Schedule of Events

- Declare intention to participate — Friday, February 21st, 2015
- Final GAP proposals due — Friday, April 17th, 2015
- Presentation reviews — Week of April 20th

(Each GAP participant will schedule a review of their PowerPoint presentation with the GAP staff)

- Final GAP Presentations — Thursday, May 7th, 2015
- Award Decision Announced — June 5th, 2015

The Florida State University Office of Commercialization Contacts

Program Contacts:

- **Larry Lynch** (850) 570-0560
  GAP Program Manager/
  Business Development Consultant
  llynch@foundation.fsu.edu

- **Tamika Martinez** (850) 644-9318
  Program and Administrative Operations Manager
  tmartinez@fsu.edu

Licensing/IP Management Contacts:

- **Brent Edington** (850) 645-5753
  Interim Executive Director
  bedington@fsu.edu

- **Abby Queale** (850) 645-9899
  Associate General Counsel
  aqueale@fsu.edu

- **Jack Sams** (850) 645-0048
  Director of Licensing
  jsams@fsu.edu

- **Eric McNair** (850) 644-3328
  Senior IP Manager
  emcnair@fsu.edu

Something to consider at the beginning of your GAP Proposal

GAP proposals are expected to contain opinion letters from outside firms that help establish that the FSU funded activity will remove some obstacles to commercial success.

If those opinions are solicited at the beginning of the application process, it is likely that the completed work plan will be different, and stronger, than it would have been if the outside review came only at the end of the process.

This year, we are asking proposers to take three steps that will make these outside reviews more useful to you and to us.

When you decide to participate, write a short description of the results that you hope to have achieved, here at FSU, at the end of the GAP funded year, and identify a long term commercial opportunity that would become more achievable if you succeed.

2. At the same time, write a letter to one or more third parties with a commercial interest in the field. Incorporate your summary proposal, and ask;
    a. Are we working on the most significant current barrier to progress in this field?
    b. If not, what do you believe that barrier to be?
    c. With that barrier removed, would you be likely to invest in further product development?
3. Send the letter out at the same time you tell us you plan to apply for GAP.

Attached is an example letter that might have been used by Dr. Alice Jones when she decided to apply for a GAP grant to establish feasibility for her fictitious portable water purifier.

Mr. Daniel Coleman
Vice President of Product Development
Coleman Company LLC (Fictitious)

Dear Mr. Coleman,

As you may remember, we met at a recent NSF commercialization review panel. My field of research at the National High Magnetic Field Laboratory involves the recovery of high value chemicals from process effluents; and I have invented a highly effective filter material that we call "Nylon X"

My research strongly suggests that it is possible and economical to produce an easily portable, hand powered water purification unit that can convert seawater to potable water.

I've asked my University to fund a project for one year that will establish:

1. Filtration rates and filter media configuration for a range of contaminants and contaminant concentrations
2. The pressure required to achieve target throughput and purity
3. At least one mechanical assembly and hand powered pressure mechanism consistent with these goals.

If you were beginning this project in your own labs, and planned to spend no more than $100K would you have other or different initial goals and priorities?

If we are successful in meeting our goals, would you feel justified in using our technology to produce a Coleman product for your market?

Thank you for considering our questions. We believe there is a mutual benefit in our efforts.

Alice Jones, PhD.

Fresh Water on Demand

Initial Technical Review

Dr. Alice Jones

Florida State University

College of Engineering

TECHNOLOGY EVALUATION FORM

Case #	08-091
Invention Disclosure Date	July 15, 2008
Meeting with inventor date	July 25, 2008
Title	Fresh water on demand
Researchers (Departments)	Alice Jones, Department of Engineering

Invention Summary

The method developed and now patented (FSU Patent # 17809235) uses a synthetic fiber call Nylon-X that has some very interesting and unique characteristics. Its fibers are extremely dense and can be used to filter out microscopic particles from a liquid. The fibers also have the ability to conduct an electrical charge. This can be used to attract or deflect particles that have electrical charges associated with them. During work on the amino acid solutions an electrical charge was applied to the Nylon-X filter and the solutions were pumped under a small amount of pressure through it. This resulted in a remarkably high purity solution. Nylon-X was even able to convert a saline solution into pure water. We feel that with the decreased availability of fresh water, our Nylon-X will help to provide us with more fresh water given its ability to purify water.

Notes from Meeting with Inventor

Dr. Jones provided a demonstration of the prototype, which worked as described. She also brought some additional written materials.

Background Assessment		
Technology remains confidential	Yes	Disclosure date: N/A
No prior claims to the technology (funding?)	None.	
Is researcher a champion and able to commit time, effort and money if needed?	Yes – Dr. Jones is willing to commit several hours per week and some personal money if needed.	
Identifiable and significant benefits	As potable fresh water becomes increasingly scarce, the need for water desalination and purification increases. Current technologies have not provided a portable desalination product, which could be used in emergency and recreational settings.	
Has concept been proven? How, where, when	Yes, the concept has been proven in Dr. Alice Jones' lab in May, 2008.	

Relevant Patents

Patent or Patent	*Patent Title*	*Date*	*Relevance*	*Assignee*
6558537	Portable hydration system	Issued May 6, 2003	A portable hydration system comprising water disinfection, filtration and pump features. The system comprises an electrolytic oxidant generating cell which utilizes a salt to create oxidants for disinfecting liquids such as water.	Miox Corporation

5685980	Minaturized handheld desalinatio n field unit	Published Nov. 1, 1997	A water purification unit including a water inlet having a filter adapted to remove undissolved contaminants from a raw water source. The water inlet is coupled to a water reservoir including a semi-permeable membrane adapted to remove dissolved contaminants from raw water source. The unit further includes a pressure source positioned within the water reservoir, wherein the pressure source forces raw water through the semi- permeable membrane. In addition, the unit is provided with a purified water container in fluid communication with the water reservoir adapted to receive the permeate water, wherein the purified water container is coupled to an oxidizing agent source.	None

Relevant Products Currently Available

Product Name	***Manufacture***	***Relevance***	***Web site/Phone #***
Portable Water Microfilter	TAIGA	This and other similar filters use carbon filtering and are designed for recreational use	http:l/www. taigaworks. ca/html/outdoor-gear/Water-Filters/ 1-866-777-8111

SteriPEN Journey LCD Handheld UV Water Purifier	SteriPEN	UV light destroys DNA and thereby prevents microbes from reproducing. Germicidal UV light – between about 240nm and 290nm – acts on thymine, one of the four base nucleotides in DNA. When a germicidal UV photon is absorbed by a thymine molecule that is adjacent to another thymine within the DNA strand, a covalent bond or dymer, between the molecules is created. This thymine dymer prevents enzymes from "reading" the DNA and copying it. Without the ability to replicate DNA, the microbe cannot reproduce and is rendered harmless.	http://www.betterhealthinnovations.com/SteriPEN_Portable_Journey_LCD_UV_Water_Purifier_p/hp-jy-rp.htm
TR Series Seawater Desalination System	Toray	The TR Series* desalination system is built upon the reverse osmosis membrane method, in which organic matter and ions in a solvent are separated by means of a membrane. A product of Toray's engineering expertise attained through many years of commitment in the field of high-polymer chemistry, the ROMEMBRA* membrane serves to sift out chlorines, organic matter and, the smallest solute of all, ions, to turn seawater into high-quality potable water.	http://www.seawater-desalination .jp/english/tsds_a001.html
Casanova's Water Equipment	Katadyn	Eliminates bacteria, protozoa, cysts, algae, spores, sediments; viruses in combination with particles greater than 0.2 microns	http://www.casanovasadventures.com/catalog/water/p300. htm#_Portable_Drinking-Water_Water_Filtration_Systems Fax: (267) 783-6065

Market Assessment	
Identifiable and marketable need	As potable fresh water becomes increasingly scarce, the need for water desalination and purification increases. Current technologies have not provided a portable desalination product, which could be used in emergency and recreational settings.
Market size and growth	*Study: Water Desalination Worldwide for Sea Water and Brackish Water 2006-2010-2015,* found that "The market for water desalination has witnessed a significant upturn during the last years. Driven by the increasing world population and the diminishing freshwater sources, a result of global warming, desertation and environment destruction, many countries in the world have constructed or are constructing water desalination plants for water supply. Meanwhile the technological innovations have been largely raising the energy efficiency of the desalination process and reducing the running costs, which are always the key concern for the large-scale water desalination. Especially, the innovations in energy utilization, such as solar energy and terrestrial heat, the advances of nanotechnology and molecular technologies have been elevating the outcome efficiency so largely that the desalination is really becoming a realistic solution for the water shortage in many parts of the world. The market volume has been soaring from $ 2.5 bn in 2002 to $ 3.8 bn in 2005 with a growth rate over 15% per annum. These figures are only plant and equipment but not the whole value chain. The market figures for the whole market, you will find in the study. It is predicted that this fast development is going to last and even accelerate for at least the next ten years. The market worldwide is to reach nearly $ 30 bn up to 2015. Dramatic increase is expected in Asia mainly China, in new technologies and small systems applications. Divided by regions, Middle East still takes over 50% of the market share, followed by Asia-Pacific, where economic boom, urbanization, population growth and environment deterioration make the municipalities and industrials eager to search for new water sources. These two regions are going to remain the leading forces for the global markets. America and Europe share about 10% of the market respectively. The construction there is mainly for the purpose of reducing the use of groundwater or adding alternative water sources."[1]

[1] http://www.hkc22.com/waterdesal ination.html

Prospective licensee(s) identified	JOE Technologies, Ltd – a joint venture between Israel Chemicals Limited and Delek Group Ltd. – submitted letter of support General Electric Co. (GE) - as part of its WaterExplorer Project, GE is committed to improving the world's drinking water - submitted letter of support Coleman Company, LLC - submitted letter of support American Red Cross - submitted letter of support

Summary

The Water on Demand technology appears novel and to fulfill an unmet need. Water filtration is a growing field, with new technologies rapidly emerging to satisfy increasing demand. Although many patents exist in the water filtration space, none appear to cover the Nylon X charged fiber filtration method. The currently available products do not address the desalination issue with such a portable and rapid solution as the Nylon X technology. Because of these factors combined with an existing working prototype and relationships with several potential licensing partners, we rate this technology as having a high degree of commercialization potential.

Completed Sample GAP Proposal

Fresh Water on Demand

GAP Proposal

Dr. Alice Jones

College of Engineering

Florida State University

November 7, 2008

Florida State University

DSR Form 1
(01/04/2007)

Division of Sponsored Research

PROPOSAL TRANSMITTAL FORM

See Instructions at http://www.research.fsu.edu/contractsgrants/forms.html ACCESS #:

PROPOSAL IDENTIFIERS:	OMNI PROPOSAL ID, V1: %	OMNI PROPOSAL ID, F1: %
1. SELECT ADMINISTERING BUSINESS UNIT:	FSU01 ☐ FSU	FSRF1 ☒ FSU Research Foundation
2. SPONSOR DEADLINE:	Date: 11/7/09 Time: Time Zone:	Requested Pick-up Date:
3. DEADLINE DATE TYPE: ☒ Electronic Submission	☐ Postmark	☐ Receipt:
4. Response to Solicitation #:	Solicitation URL:	
5. If SRS or FSURF has questions about this proposal, whom should we contact? Fill in contact information below:		
NAME: Dr. Alice Jones	PHONE:	EMAIL:
6. SPONSOR: FSU Research Foundation		OMNI Sponsor ID #
7. If Federal pass-through funding, enter name of Federal agency where funds originated:		
8. TITLE: Freshwater On Demand		

9. INVESTIGATOR INFORMATION

REPORTING CREDIT: This data is used for reporting purposes only. Allocate credit using **whole** numbers. Each investigator must receive a minimum of 1% credit. Sum of all allocations must equal 100%.

Allocation of credit for indirect cost distribution must be entered on the second page under the Department Information section.

ROLE	NAME	OMNI EMPLID	DEPT NAME	REPORTING % (Minimum of 1%)
PI	Alice Jones	0	ENG	100 %
Co-PI				%
Co-PI				%
Co-PI				%
Co-PI				%

10. APPROVALS

Each signer below certifies that:

- He/she has reviewed this proposal and approves of this activity;
- Cost sharing funds, if required, will be made available when the project is funded;
- Office, laboratory, or any other space including non-animal space or space for animals, if appropriate, particularly associated with this project is available; and
- He/she has read and understood FSU's Investigator Financial Disclosure policy and FSU's Conflict of Interest policy and all required disclosures have been made.

SIGNATURE	DATE	SIGNATURE	DATE
PI ⇨			
Co-PI ⇨		Co-PI ⇨	
Co-PI ⇨		Co-PI ⇨	

Chairs and Deans need only sign once, even if multiple investigators involved from a department or college.

SIGNATURE	DATE	SIGNATURE	DATE
CHAIR ⇨		DEAN ⇨	
CHAIR ⇨		DEAN ⇨	
CHAIR ⇨		DEAN ⇨	
CHAIR ⇨		DEAN ⇨	
CHAIR ⇨		DEAN ⇨	

DEPARTMENT INFORMATION

11. PROJECT ADMINISTRATION Identify the DeptID to use on Project budget chartfield if awarded.

Dept Name: **Engineering**	DEPTID: **0**

12. INDIRECT COST DISTRIBUTION: This data is used for distribution of indirect costs (F&A). Allocate credit using whole numbers. Sum of all allocations must equal 100%.

Dept Name: **Engineering**	Credit DeptID: **10090**	Distribution: **100%**
Dept Name:	Credit DeptID:	Distribution: %
Dept Name:	Credit DeptID:	Distribution: %
Dept Name:	Credit DeptID:	Distribution: %
Dept Name:	Credit DeptID:	Distribution: %

PROPOSAL INFORMATION

13. PROPOSAL TYPE: ☒ New ☐ Continuation ☐ Renewal ☐ Supplement ☐ Revision ☐ Transfer

14. PROJECT DATES:	**15. PROJECT LOCATION**	**16. F&A INFORMATION**
Begin: **1/1/2009**	☒ On-Campus ☐ Off-Campus ☐ Magnet Lab	Rate **0.00** % Base:
End: **1/1/2010**	If Off-Campus, enter performance site: ____	F&A Waiver Code: ☐ None ☐ Mandatory ☐ Voluntary

17. PROJECT PURPOSE: ☒ Research _____ ☐ Other Sponsored Activity_____ ☐ Instruction_____.

PROPOSED COSTS

18. Total Requested from Sponsor	$ **50,000.00**	Attach detailed budgets for all proposed costs.	
19. Total FSU Cost Sharing	$	☐ Voluntary ☐ Required by Sponsor	Attach Cost Sharing Commitment Form.
20. Total Third-Party Match	$	Attach written commitment from contributor's authorized signer.	

MISCELLANEOUS INFORMATION

21. Non-Faculty Support Identify the total number of the following personnel supported by this grant (numbers should be based on Headcount, not FTE):

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Total # Undergraduate Students:					
Total # Graduate Students:	**1.75**				
Total # Postdoctoral Associates:					
Total # Non-Students/ Non-Ranked Faculty :					

22. KEYWORDS (Enter as many as desired but at least one is required)

View Proposal Keywords at **http://www.research.fsu.edu/contractsgrants/documents/keywords.xls**. If desired keyword is not on list, you may enter suggested additions.

CERTIFICATIONS

Check any of the following special circumstances that apply to this project and include attachments when applicable:

23. Vertebrate Animals	Protocol #	Attach ASU Form ☐	☐ Yes
24. Human Subjects			☐ Yes
25. DNA/RNA Use			☐ Yes

26. Radioactive Materials	☐ Yes
27. Hazardous Chemicals	☐ Yes
28. Select Agents	☐ Yes
29. Marine Lab (SRS will send a copy of proposal to the Director of the FSUCML.)	☐ Yes
30. Compressed Air Diving (ADP) (SRS will send a copy of proposal to the Chair of the Dive Control Board and the ADP Coordinator.)	☐ Yes
31. Faculty Overload	☐ Yes
32. Dual Compensation	☐ Yes
33. Workshops/Conferences	☐ Yes
34. If 33 is Yes, will fees be collected?	☐ Yes
35. If 34 is Yes, is the dept collecting the fees a Certified Cash Handling Site?	☐ Yes
36. If 33 is Yes, will Continuing Education Units (CEU's) be issued?	☐ Yes
37. Subcontracts and/or consultants are needed to conduct this project.	☐ Yes
38. Income, other than payments from the sponsor, will be generated as a result of this project.	☐ Yes
39. This project is a continuation or renewal of a previous or current project. Enter Project ID:	☐ Yes
40. Additional resources such as animal or non-animal space, equipment, utility service, etc., are needed to conduct this project in addition to what is currently available to you or is budgeted for this in the proposal. If yes, complete the following: Resource Requested: _____ Estimated Cost of Resource: _____ Authorized signature of source of additional resources:	☐ Yes

Conflicts of Interest:

41. Does any investigator (PI, Co-PI, or other key personnel) working on this project have a conflict of interest, whether financial or otherwise, direct or indirect, as defined in FSU's Faculty Handbook Section 7.47.2.II, Financial Disclosure Policy; FSU's Faculty Handbook Section 7.45, Conflict of Interest; or Florida Statutes Chapter 112, Code of Ethics for Public Officers and Employees?	☐ Yes ☐ No
42. If the answer to 41 is yes, has the interest been disclosed to the appropriate Dean or Vice President according to the regulations identified above?	☐ Yes ☐ No

43. MATRICULATION and/or TUITION FEE WAIVERS: (CHECK ONLY ONE)

☐ **WAIVER 1** Charge the project all matriculation fees for graduate assistants and out-of-state tuition for Eng majors paid from project funds.	☐ **WAIVER 2*** The College/School Waiver Allocation will cover all tuition of students paid or supported by this proposed project. Specify DeptID:	☐ **WAIVER 3*** An alternate source will cover all tuition of students paid or supported by this project. DeptID:_____ Fund: ___ Project ID: _____	☐ **WAIVER 4** This Contract/Grant will pay the matriculation fee for graduate assistants only, even if engineering majors are involved in this project.

*If WAIVER 2 or WAIVER 3 is selected above, explain why the Contract/Grant will not be charged AND obtain authorizing signature below: _____

Authorizing Signature for College/School or Alternate Source:_____

OMNI GRANTS SECURITY ROLES

44. Post-Award Project Team. The PI and Co-PI's are automatically added to the Team. If the Co-PI needs to approve expenditures, add his/her name here with the SP Manager role. Dept Reps have no expenditure authority. SP Managers have authority to approve all non-travel expenditures.

NAME	OMNI EMPLID	ROLE
		☐ Dept Rep ☐ SP Manager
		☐ Dept Rep ☐ SP Manager
		☐ Dept Rep ☐ SP Manager
		☐ Dept Rep ☐ SP Manager
		☐ Dept Rep ☐ SP Manager

45. Post-Award Travel Approver. One Project Manager is allowed to approve travel. The PI is the default travel approver. If an alternate travel approver is desired, enter information below.

NAME:	OMNI EMPLID:

FOR SRS INTERNAL USE ONLY	CFDA #	NSF Report Code:
APPROVED FOR VPR: Initials/Date		DSR Form 1 (01/04/2007)

Fresh Water on Demand

THE PROBLEM

It has been said by many that water will be the new oil. As the population of the world continues to grow the demand for fresh clean water will grow as well. This demand will come at a time when the supply of quality fresh water will be under increased decline due to many factors. The first will be from the increase in usage for irrigation needed for agriculture. The second factor that will affect supply will be from the effects of climate change. As the earth continues to warm the amount of fresh water at the earth's surface will continue to shrink. The third and potentially largest factor on fresh water supply continues to be the increase in the pollution level being introduced into the supply. Over the past hundred years the world's supply of unpolluted surface fresh water has been reduced by more than 50%. All in all, the supply picture for usable fresh water in the future is not a pretty one.
Many have predicted that the lack of available water will lead to famine, social and political unrest and even to possible war. So it is clear that any scientific breakthroughs that will increase freshwater availability will be embraced by society.

POTENTIAL SOLUTION

In our lab we have developed and now patented (FSU Patent Application # 17809235) a synthetic fiber call *Nylon-X that* has some very interesting and unique characteristics. Its fibers are extremely dense and can be used to filter out most if not all microscopic particles from a liquid. The fibers also have the ability to conduct an electrical charge. This can be used to attract or deflect particles that also have electrical charges associated with them. During our work on the amino acid solutions we did an experiment where we applied an electrical charge to a small patch of Nylon-X and used it as a filter. We then pumped an amino acid solution under a small amount of pressure through it. The results were quite remarkable as the purity, which resulted, was extremely high. We then tested the Nylon-X filter with salt water and found the resulting liquid to be pure freshwater. We feel that with the decreased availability of fresh water, our Nylon-X could help to provide us with more fresh water given its ability to purify water.

Novel Technology

Our lab at Florida State has been doing research in the filtration of liquids. Mainly our work has been directed at being able to remove impurities in different chemical compounds that exist in a liquid state thus making those compounds more effective. We have developed many different methods of filtration including using electromagnetic fields, the use of new manmade synthetic fibers and the use of temperature and pressure. In our most recent work we have been using a combination of these forces to try and increase the purity level of amino acids that exist in a saline solution for the bioengineering field.

As part of our process we routinely clean the entire filtration system with pure water, effectively putting water in place of the solution (in this case the amino acid solution) and run it through the process. We expect the final product in this cleaning exercise to be pure fresh water. One of our research assistants was performing this cleaning procedure when he noticed he had mistakenly substituted a saline solution (essentially seawater) for the pure

water that is required for the cleaning process. Just for research sake he looked to see what the resulting liquid solution would be. To our complete surprise we discovered that it was pure water! Our system was able to take seawater and only using our filter, a very small electric charge and a small amount of pressure we were able to make pure water. We were very excited about these results and the possible commercialization opportunities that might exist for products using this technology.

THE MARKET

FSU's technology has the potential to become a major factor in the world-wide water desalination market. Potable water is a scare commodity in many developing countries. Increasing population and environmental pollution is making clean water scare in developed nations as well. An inexpensive, compact device such as that being developed in our lab could gain a significant share of this billion dollar market.

The report, *Study: Water Desalination Worldwide for Sea Water and Brackish Water 2006-2010-2015 found* that 'The market for water desalination has witnessed a significant upturn during the last years. Driven by the increasing world population and the diminishing freshwater sources, a result of global warming, desertation and environment destruction, many countries in the world have constructed or are constructing water desalination plants for water supply. Meanwhile the technological innovations have been largely raising the energy efficiency of the desalination process and reducing the running costs, which are always the key concern for the large-scale water desalination. Especially, the innovations in energy utilization, such as solar energy and terrestrial heat, the advances of nanotechnology and molecular technologies have been elevating the outcome efficiency so largely that the desalination is really becoming a realistic solution for the water shortage in many parts of the world. The market volume has been soaring from $ 2.5 bn in 2002 to $ 3.8 bn in 2005 with a growth rate over 15% per annum. These figures are only plant and equipment but not the whole value chain. The market figures for the whole market, you will find in the study. It is predicted that this fast development is going to last and even accelerate for at least the next ten years. The market worldwide is to reach nearly $ 30 bn up to 2015. Dramatic increase is expected in Asia mainly China, in new technologies and small systems applications.

Divided by regions, the Middle East still takes over 50% of the market share, followed by Asia-Pacific, where economic boom, urbanization, population growth and environment deterioration make the municipalities and industrials eager to search for new water sources. These two regions are going to remain the leading forces for the global markets. America and Europe share about 10% of the market respectively. The construction there is mainly for the purpose of reducing the use of groundwater or adding alternative water sources."[1] The market for on-demand fresh water in small quantities will continue to grow as well. This growth will come from several areas. Recreational use will include the camping and boating industry which today utilizes chemical water purification as the chief method for making potable water out of non-potable water. A second major market will be the ability to provide an inexpensive and mobile water purification method for drinking and cooking water in the

[1] http://www.hkc22.com/waterdesal ination.htm l

third-world countries that don't currently have access to clean water sources provided in mass.

POTENTIAL COMMERCIALIZATION PARTNERS

IDE Technologies, Ltd is a joint venture between Israel Chemicals Limited and Delek Group Ltd. IDE has a $100 million contract to build a desalination plant in Australia, with construction to begin this year.

In 2005, the company, along with Veolia Environment and Dankner-Ellem, built the world's largest desalination plant in Ashkelon, Israel, capable of delivering up to 6% of Israel's water needs. In 2006, less than a year after initial production, it won Desalination Plant of the Year at the Global Water Awards.[2]

Additionally, General Electric Co. (GE) has expressed interest in this technology. As part of its WaterExplorer Project, GE is committed to improving the world's drinking water. We have provided GE management with our research materials and received positive feedback. We anticipate that GE

Furthermore, Coleman Company, LLC and the American Red Cross have expressed interest in using this technology. All of these companies have submitted letters of support for this technology.

PROPOSED USE OF **GAP** FUNDING

We propose to construct a working prototype of a one gallon "fresh water on demand" device utilizing the "Nylon X" technology described above. This effort will take approximately one year to complete. We have constructed an implementation plan attached to this document that details the proposed funding requirements to complete this development. We have broken the implementation plan into four phases. Each phase contains a verifiable objective. This objective is basically a critical point in each phase that if we don't successfully reach, the rest of the project cannot be achieved. Once we have successfully completed the entire prototype effort we will be at point where we can go forward to seek a commercial partner who can help us bring this technology into the market as a viable product.

[2] http://www.greenchipstocks.com/articles/desalination-companies-stocks/ 195

Fresh Water on Demand

Professional Biography

Dr. Alice Jones

College of Engineering

Florida State University

November 7, 2008

Dr. Alice Jones is currently an associate professor in the College of Engineering at the Florida State University. Dr. Jones earned her doctoral degree in 1999 from the University of Texas at Austin in the Materials Science and Engineering Department. She came to FSU in 2003 from the College of Engineering at the Georgia Institute of Technology where she worked as a post-doc with Dr. Herman Smith. Dr. Smith is a world renowned expert in filtration systems and has many patents to his credit. Her postdoctoral work focused on materials science and the development of different kinds of porous membranes. During her time at Georgia Tech Dr. Jones conducted research into a new filtration device using a variation of a nylon fiber system. When Dr. Jones arrived at FSU she continued her work on the nylon product and was awarded a patent in 2005 for Nylon X. Dr. Jones currently runs her lab on the FSU campus and has multiple contracts with clients such as the Department of Defense, The Florida Fish and Wildlife Agency, The Nature Conservancy and several for profit companies doing research in the liquid purification area.

Dr. Jones has several patents to her credit dealing with filtration systems and has been published in many of the journals that deal with the subject. Below are a few of the publications Dr. Jones has published in her career:

I. Jones,A, Xu Y, Wong-Staal F. Identification and purification of cellular proteins that specifically interact with the RNA constitutive transport elements from retrovirus D. Virology 1997 228:333-339.
2. Jones,A, Gaietta GM, Fischer WH, Ellisman MH, Wong-Staal F. A cellular cofactor for the constitutive transport element of type D retrovirus. Science 1997 276:1412-1415.
3. Reddy TR, Jones, A, Li X, Wong-Staal F. Functional interaction of the HTLV-1 transactivator Tax with activating transcription factor-4 (ATF4). Oncogene 1997 14:2785-2792.
4. Li J,* Jones,A,* Mullen TM, Westberg C, Reddy TR, Rose DW, Wong-Staal F. A role for RNA helicase A in post-transcriptional regulation of HIV type I.Proc Natl Acad Sci USA 1999 96:709-714.
5. Jones,A, McDonald D, Middlesworth T, Hope TJ, Wong-Staal F. The carboxyl terminus of RNA helicase A contains a bidirectional nuclear transport domain. Mol Cell Biol 1999 19:3540-3450.
6. Reddy TR, Xu W, Mau JK, Goodwin CD, Suhasini M, Jones,A, Frimpong K, Rose DW, Wong-Staal F. Inhibition of HIV replication by dominant negative mutants of Sam68, a functional homolog of HIV-I Rev. Nature Med 1999 5:635--042.
7. Jones,A, Kuhen KL, Wong-Staal F. Lentivirus replication and regulation. Annu Rev Genet 1999 33:133-170.
8. Westberg C, Yang JP, Jones,A, Reddy TR, Wong-Staal F. A novel shuttle protein binds to RNA helicase A and activates the retroviral constitutive transpm1element. J Biol Chem 2000 275:21396-21401.
9. Jones,A, Wong-Staal F. Specific interaction between RNA helicase A and Tap, two cellular proteins that bind to the constitutive transport element of type D retrovirus. J Biol Chem 2000 275:32694-32700.
I0. Reddy TR,* Jones,A,* Xu W, Wong-Staal F. Sam68, RNA helicase A and Tap cooperate in the post-transcriptional regulation of human immunodeficiency virus and type D retroviral mRNA. Oncogene 2000 19:3570-3575.
11. Yang JP, Jones,A, Reddy TR, Wong-Staal F. Mapping the functional domains of HAP95, a protein that binds RNA helicase A and activates the constitutive transport element of type D retroviruses. J Biol Chem 2001 276:30694-30600.
12. Kuwabara T, Warashina M, Sano M, Jones,A, Wong-Staal F, Munekata E, Taira K. Recognition of engineered tRNAs with an extended 3' end by Exportin-t (Xpo-t) and transport of tRNA-attached ribozymes to the cytoplasm in somatic cells. Biomacromolecules 2001 2:1229-1242.

Fresh Water on Demand

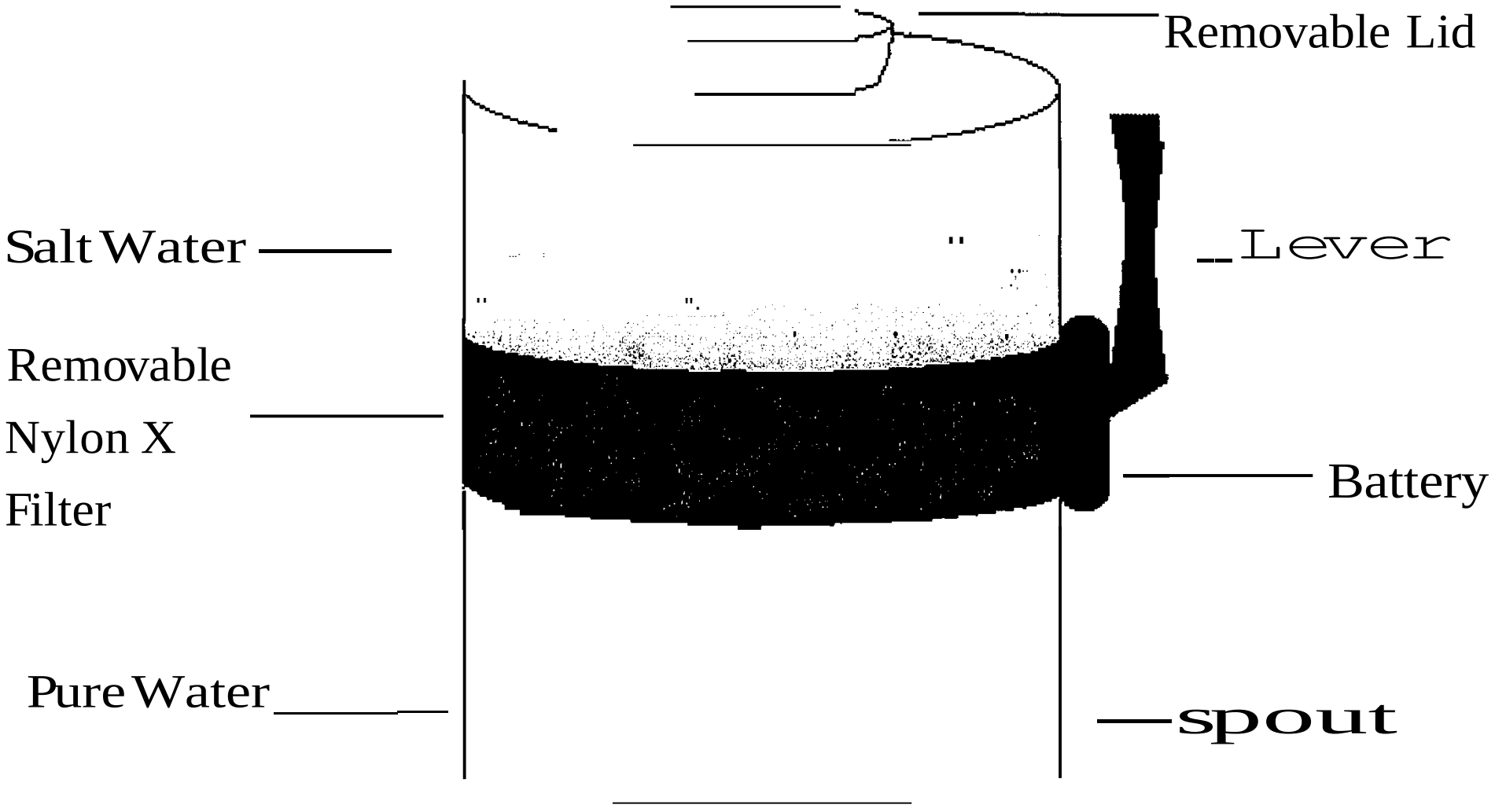
Pictures and Diagrams of Potential Product

Dr. Alice Jones

College of Engineering

Florida State University

November 7, 2008


Removable Lid
Salt Water
Lever
Removable
Nylon X
Filter
Battery
Pure Water
spout

Fresh Water on Demand

Cost and Activities Plan

Dr. Alice Jones

College of Engineering

Florida State University

November 7, 2008

Phased Implementation Plan

Phase 1

Timetable: January 1- March 30
Objective: To design and build a cylinder that can handle a pressure load equal to 4 times atmospheric pressure. This cylinder would hold I gallon of saltwater as well.
Required funding for Phase 1: $11,750
Failure point: Cylinder unable to maintain 4 atmospheres of pressure
If successful, proceed to Phase 2, if not, end of project.

Phase 2

Timetable: April I-June 30
Objective: To design and build a removable Nylon X filter that will be used in the cylinder built in Phase 1. The filter must be able to successfully filter I gallon of saltwater into freshwater.
Required funding for phase 2: $14,750
Failure point: The filter clogs or fails under 4 atmospheres of pressure.
If successful, proceed to Phase 3, if not, end of project.

Phase 3

Timetable: July I-September 30
Objective: To design and implement a small power supply that will attach to the Nylon X filter built in phase 2. This power supply will need to be battery driven and able to last over 30 gallons of purification.
Required funding for Phase 3: $11,750
Failure point: The power connection or duration does not meet basic needs.
If successful, proceed to Phase 4, if not, end of project.

Phase 4

Timetable: October I-December 31
Objective Final field-testing of completed prototype. The unit will be subjected to different elements (heat, humidity etc.) to ensure its successful use in these elements.
Required funding for phase 4: $11,750
If successful, move to find construction partner.

Fresh Water on Demand

Supporting Letters of Interest

Dr. Alice Jones

College of Engineering

Florida State University

November 7, 2008

The Outdoor Company - (Mythical)

March 15, 2007

Alice Jones, Ph.D.
Director, High-Performance Materials Institute (HPMI)
National High Magnetic Field Laboratory
1115 West Call Street
Tallahassee, FL 32306

Dr. Jones,

This is our letter of support for your GAP Proposal to the Florida State University Research Foundation.

The Coleman Company, LLC is firmly committed to supporting your efforts in creating a new water purification device. We believe that your efforts in developing a new filter made out of Nylon-x will prove to be invaluable to our outdoor customers. Coleman is very interested in the prototype you are developing and its progress.

Coleman Company, LLC has almost 100 years' experience with producing and supplying their customers with outdoor products. These products are designed to enhance people's outdoor experiences, as well as give them some of the conveniences of home. We feel that this technology will allow our customers the surety that the water they will be using is clean and doesn't contain any impurities.

Based on the opportunities this new product will provide for our company, we are willing to enter into an agreement with the Florida State University Research Foundation once the prototype has been proven.

We look forward to being of service to you in your endeavors to commercialize this product.

Sincerely,
Daniel Coleman
Vice President of Product Development

(Mythical)

March 15, 2007

Alice Jones, Ph.D.
Director, High-Performance Materials Institute [HPMI)
National High Magnetic Field Laboratory
1115 West Call Street
Tallahassee, FL 32306

Dr. Jones,

This is a letter showing that GE is very interested in the product you are developing using the revolutionary filter made out of Nylon-X.

GE is currently working on helping to solve the water scarcity problem with our WaterExplorer project. We are currently establishing efforts for homes and businesses to practice more conservative water usage, as well as helping to install desalination plants around the world so that we can use the oceans to our advantage. Furthermore, we have developed technologies that will help turn wastewater into a renewable resource. We feel that the filter made with Nylon-x will help us to further these efforts in solving the water scarcity problems of the world.

We are committed to furthering water purification techniques, thus we are interested in your technology. We want to fully show our support of your work with this letter because we feel that your progress will prove to be an asset to our company.

Based on the success of this technology, we would be willing to enter an agreement with the Florida State University Research Foundation. We look forward to working with you, Dr. Jones, in the future.

Sincerely,
Jeff R. Garwood
President and CEO of GE Water & Process Technologies

American
Red Cross
(Mythical)

March 15, 2007

Alice Jones, Ph.D.
Director, High-Performance Materials Institute (HPMI) National High Magnetic Field Laboratory
1115 West Call Street
Tallahassee, FL 32306

Dr. Jones,

This letter is to show our support for Dr. Jones' work in developing a water purification device using a filter made out of Nylon-X.

The Red Cross is completely in support of Dr. Jones efforts in developing a handheld device for water purification. We would find this immensely useful for our disaster relief personnel because clean water is difficult to come by in a third world country, let alone after a natural disaster. Moreover, we would also be able to supply them to the people in third world countries who so desperately need them. This technology would help us to aid much of the world with its clean water problems.

The Red Cross has over l00 years of experience as the nation's premier emergency response organization. As part of a worldwide movement that offers neutral humanitarian care to the victims of war, the American Red Cross distinguishes itself by also aiding victims of devastating natural disasters. Over the years, the organization has expanded its services, always with the aim of preventing and relieving suffering.

Based on the success of this technology we feel that it will help us in our endeavors, and we would be willing to enter into an agreement with the Florida State University Research Foundation.

Sincerely,
Betsy Ross
President of the American Red Cross

Dr. Alice Jones,

I enjoyed meeting you and discussing your research at the International Water Technology Conference last year.

IDE has a continuing interest in the Nylon-X materials under development in your lab. The possibility of furthering our understanding of water desalination and purification is important.

It does appear that there is the possibility of producing an improved method of procuring potable water through this study. This is a process that is of the highest interest to IDE.

The prospect of using the fundamental understanding that this program will develop together with the development of a cost-effective product, which you indicate is now a possibility represents an important step forward in the difficult business of providing clean water.

Please keep us informed of your progress. I look forward to hearing that you have been successful in obtaining additional support and hope to further our collaboration in the future.

IDE Management (Mythical)

Fresh Water on Demand

PowerPoint Presentation Slides

Dr. Alice Jones

College of Engineering

Florida State University

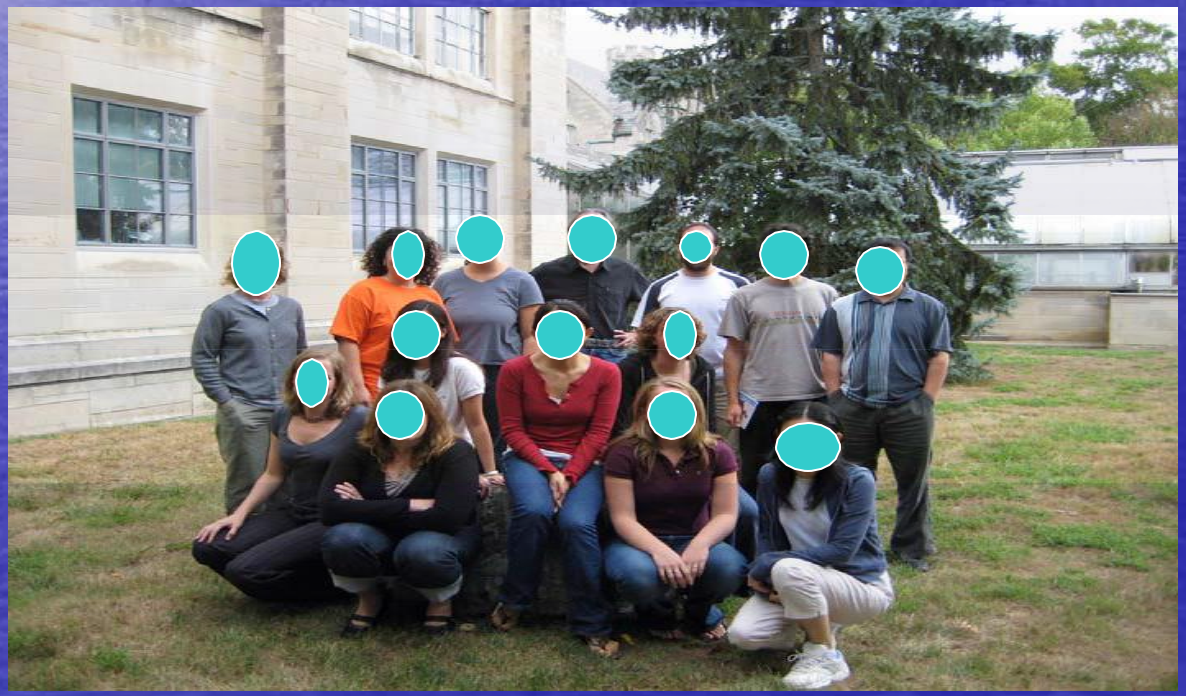
November 7, 2008

Water on Demand

Dr. Alice Jones

The Jones Lab

Focus on developing high density synthetic fiber technology



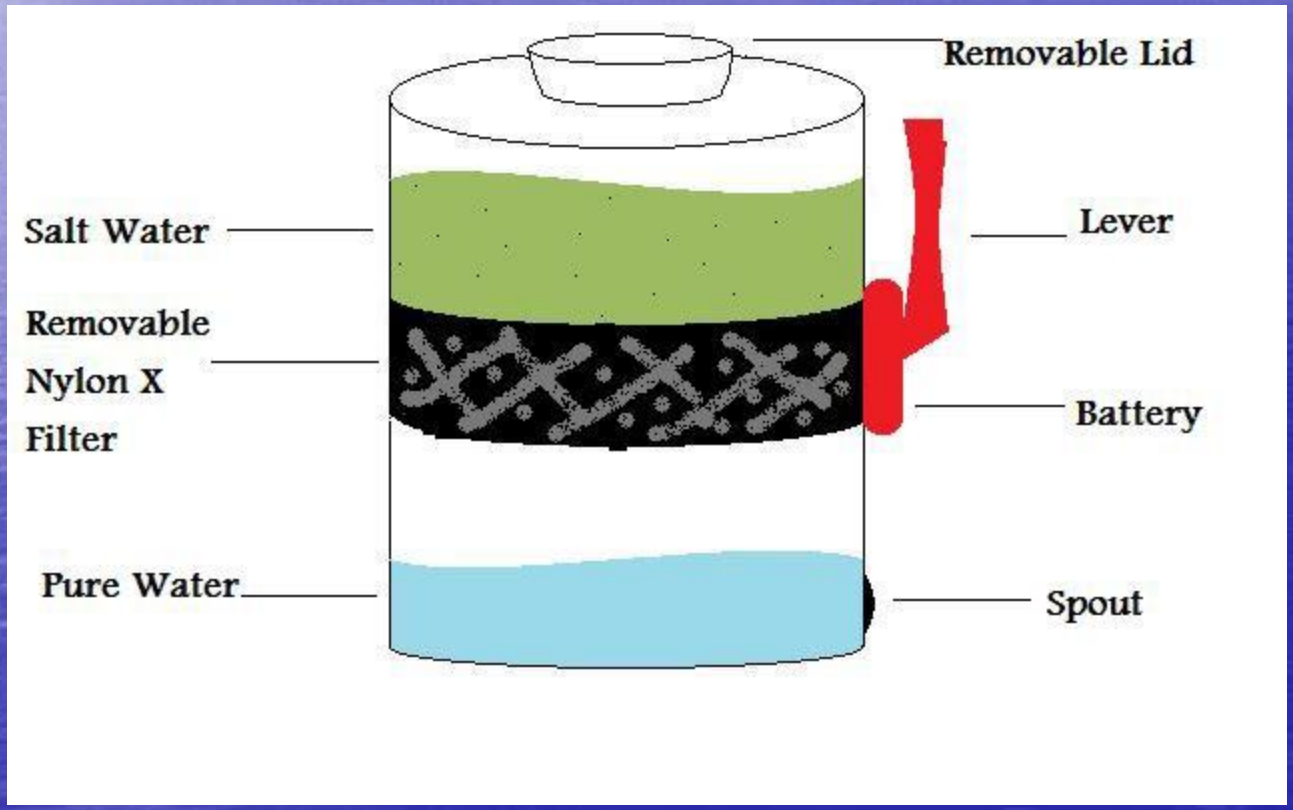
The World Needs Potable Water

- Over the past 100 years, the world's potable water supply has decreased by 50%
- As the Earth continues to warm, the amount of fresh water decreases

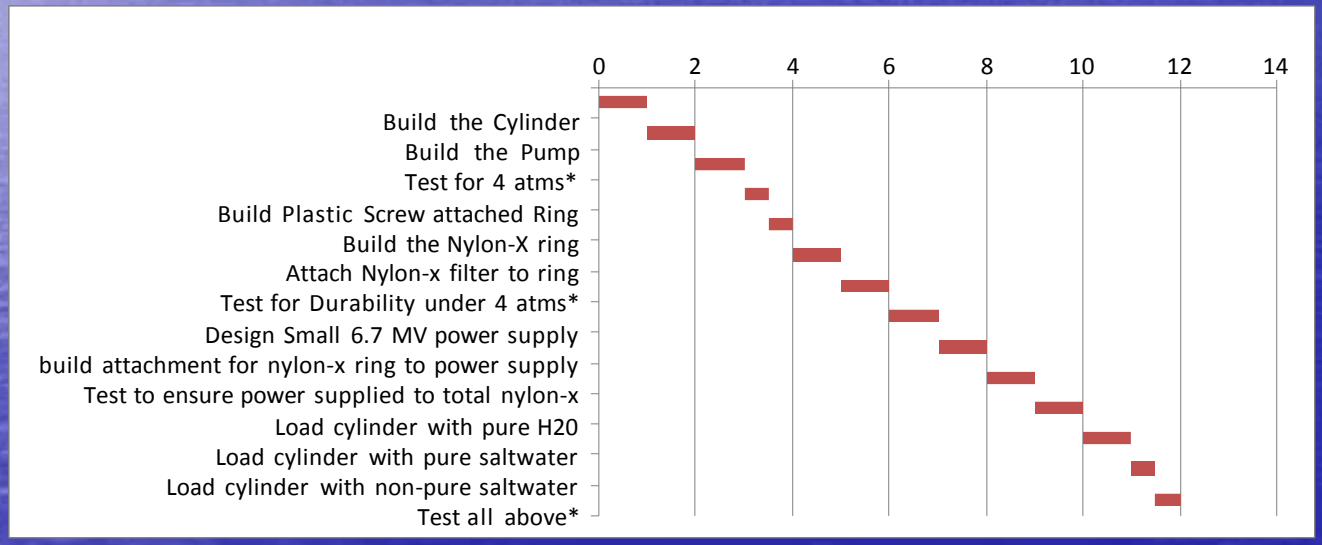
Nylon-X

- Synthetic fiber with unique filtering power
- Electrical charge capability
- Tested and proven to remove 100% or salt from seawater
- Florida State University Patent Filed

Nylon X
Portable Water Filtration Device



Business Plan



Market Information

- The worldwide water desalination market volume soared from $2.5 billion in 2002 to $3.8 billion in 2005
- 15% increase per year expected over the next ten years