EVALUATION OF BIOLOGICAL FORMULATIONS FOR INDUSTRIAL WASTESTREAMS TREATMENT

India
June 6 - 30, 1994

Prepared for:

US - ASIA ENVIRONMENTAL PARTNERSHIP

WORLD ENVIRONMENT CENTER

DISCLAIMER

This project was sponsored by the U.S. Agency for International Development (USAID) through the World Environment Center's (WEC) Cooperative Agreement in support of the U.S.-Asia Environmental Partnership (US-AEP). The opinions expressed herein are the professional opinions of the author and do not represent the official position of the Government of the United States of America or the World Environment Center.

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I. EXECUTIVE SUMMARY

U.S. Biotech Inc. of Teterboro, New Jersey produces advanced bacterial formulations for the treatment of wastewater. The formulations operate on the principal of "bio-augmentation" in which large amounts of naturally occurring bacteria are introduced into a closed or partially closed system for the purpose of cleaning polluted water. Premier Ziba ltd. of India was interested in learning about this technology and sought assistance through the United States Agency for International Development (USAID) Trade in Environmental Services and Technologies (TEST) program. Mr. Jeff Hallett, manager of the TEST program facilitated an Environmental Business Exchange (EBE) with the World Environment Center (WEC) for Premier Ziba to travel to the U.S. during the week of June 20, 1994 and meet with U.S. Biotech Inc.

This EBE between Premier Ziba and U.S. Biotech Inc. was intended to promote discussion of bio-augmentation technologies and their application to wastewater treatment problems in India,lead to signing of a formal distribution agreement, and allow the principles to develop a marketing plan for India with a focus on pilot demonstration sites. U.S. Biotech provided a series of technical briefings on their products including applications from other overseas clients. A formal distribution agreement was signed by Fred Santaite Sr., President of U.S. Biotech Inc., and Govind Srivastava, Managing Director of Premier Ziba Ltd. Premier Ziba provided technical details from three industrial sites including a distillery, tannery, and a sewage treatment facility all of which had agreed to be a test site.

Both parties agreed to exchange additional data to calculate the costs of demonstrating the effectiveness of the formulations over a 60 day pilot program at each of the facilities. Premier Ziba believes this course of action will be the best method of attracting and maintaining industrial customers. The outstanding issues and action items are reflected below:

- Premier Ziba will continue to pursue and obtain the mandatory regulatory clearances to import U.S. Biotech products into the Indian market. Certification is expected in September of 1994.

- Premier Ziba will also pursue methods of reducing tariffs on product import. Relief should be provided based on the friendly environmental impact of the products.

- Premier Ziba, U.S. Biotech Inc., and Commonwealth Trading Partners Inc. will continue to pursue U.S. government financing vehicles to implement pilot demonstration projects.

- Premier Ziba will meet with ICICI in Bombay regarding financial mechanisms to implement late stage manufacturing capability in India.

Commonwealth Trading Partners (CTP) is an export consulting firm based in Herndon, Virginia and specializes in export regulations as well as joint ventures involving technology transfer. Premier Ziba has hired CTP to pursue U.S. government financing mechanisms including grants and loans for demonstrating U.S. Biotech Inc. products in India. In the near future Premier Ziba and CTP will be seeking funding for the pilot demonstration programs at specific industrial sites arranged by Premier Ziba.

Funding for this project was provided through a Cooperative Agreement between the World Environment Center and the United States-Asia Environmental Partnership (US-AEP).

II. INTRODUCTION

The purpose of this Environmental Business Exchange (EBE) was to introduce Premier Ziba to U.S. Biotech bio-augmentation formulations, sign a distribution agreement, and develop a joint strategy for penetrating the Indian market. As bio-augmentation techniques are a relatively new technology for treating wastewater treatment problems in India, the most expeditious method of introducing this technology to private parties in India involved the business exchange program.

Meetings between U.S. Biotech Inc. and Premier Ziba took place on June 20, and 21, 1994. In attendance were Mr. Fred Santiate Sr, President of U.S. Biotech Inc., Fred Santaite Jr., Vice President of U.S. Biotech Inc., Richard Holmes, Director of New Markets for U.S. Biotech Inc., Mr. Govind Srivastava, Managing Director of Premier Ziba Inc., Mr. Lankshmun Srivastava, Premier Ziba Environmental Division, Mr. Shashank. Diesh, Chief Scientist of Premier Ziba, and Mr. Thomas Fergus, President of Commonwealth Trading Partners and consultant to Premier Ziba.

III. WASTE MINIMIZATION TECHNIQUES

U.S. Biotech Inc. has four major product families, each of which manufactures multiple products based on a specific bacterial strain or mixture of bacterial strains. For industrial wastewater treatment including treatment of targeted distillery and tannery wastestreams, Premier Ziba would use the IND 1000 C formulation which is a mixture of bacterial strains specifically formulated to cope with difficult compounds and chemicals present in wastewater effluent. IND 1000C contains bacterial strains which actually digest difficult and non-biodegradable compounds such as detergents, paper, oil, grease, hydrocarbons, and phenols.

The following measurable technical results would also be reflected at any of the 3 pilot test sites, in the first 30 to 60 days of treatment, based on proper application:

- reduced BODs (Biological Oxygen Demand) from effluents
- reduced CODs (Chemical Oxygen Demand) from effluents
- total nitrogen content reduced

The following environmental and costs benefits would be realized:

- reduced amount of contaminants generated
- reduced sludge volume generated
- reduce odor
- reduced chemical use

IV. FINDINGS

The ownership of both U.S. Biotech and Premier Ziba is private. Based on information provided to CTP during the course of the meetings, U.S. Biotech indicated they employed over 100 people and had sales in excess of US$7 million in 1993.

Premier Ziba Ltd. is a professional services company with a background in battery manufacturing in association with Union Carbide and Gould Inc. dating from the early 1970s. Premier Ziba is familiar with appropriate handling of toxic chemicals based on their battery manufacturing experience, therefore, Premier Ziba personnel have used and properly disposed of heavy metal cadmium. The company's role in the partnership with U.S. Biotech Inc. will be that of the sole distributor and representative of U.S. Biotech in India. Premier Ziba will import the product into the country and have field employees actively demonstrating and training industrial customers on the proper methods and techniques for use of the formulations. As a result of this arrangement, Premier Ziba hopes to have a strong industrial client base within two and one half years after receiving the appropriate import clearances from the Indian Ministry of Biotechnology.

The potential environmental issues involved in the set-up of pilot wastewater treatment sites are the specific pollutants at the pilot sites and the appropriate formulation to treat them. A technical remark made during the discussions pointed out that chromium is used in the tannery for softening leather. This heavy metal is toxic to the bacteria, although in appropriate proportions, the formulations could absorb enough chromium to treat the wastewater effectively. Premier Ziba and U.S. Biotech are planning to exchange specific technical information to address these points. To show immediate success, the pilot sites were prioritized based on their ease of cleanup in the following order:Distillery, Sewage Treatment Facility and Tannery.

V. COST AND PAYBACK INFORMATION

The cost and payback information is dependent on a successful pilot demonstration at the distillery, sewage treatment plant, or tannery. As technical information is still being exchanged to calculate the quantity of product required to successfully attack the existing site problems, no quantitative data is available at this time.

Premier Ziba learned about a State Department OES grant opportunity from Sanders International and applied using CTP Inc. in early June 1994. All parties involved believe financing for demonstration is required for effective market entry by Premier Ziba. An excerpt from that proposal provides some guidance on how the OES or other funding would be used.

COSTS: The entire grant will be used only for project implementation and will not be used for any travel between the U.S. and India. A breakdown of the costs is as follows:

$25,000.00	Initial stock at research price of U.S. Biotech Inc. JAD 969P and INC 1000
$5,000.00	International transportation and insurance of stock (U.S. to Delhi) and local transportation to pilot sites from Premier Ziba Ltd. warehouse.
$15,000.00	Repackaging, labor, and operational cost for two 60 day pilot sites.
$4,000.00	Independent sample testing and reporting by Biotech Consortium Ltd.
$1,000.00	Project summary and report
$50,000.00	TOTAL

LEVERAGE: The collaborative efforts of Premier Ziba and U.S. Biotech Inc. have been reviewed by Sanders International for consideration under the USAID Trade in Environmental Services and Technology (TEST) Program for India. U.S. Biotech Inc. and Premier Ziba are discussing the technology transfer aspects of manufacturing some of the formulations in India with local ingredients within the next 18 months. The U.S. Biotech Inc. bio-augmentation technology is new, but holds promise as an environmentally friendly method of treating a number of wastewater problems in India. A joint venture to do final stage manufacturing for industrial applications in Delhi as well as repackaging for the consumer market will be recommended to USAID for funding

under the TEST program. However, before reaching that phase of the project, funding for meaningful market entry is required. Both parties feel a grant from OES for these pilot projects would provide the required boost this U.S. product needs for sustained market access and growth.

BROADER GOALS: Premier Ziba's own research indicates the market for waste water treatment materials is $30,000,000 in India. The OES grant will enhance U.S. exports and open a market U.S. Biotech Inc. would not have otherwise pursued in the near term. U.S. Biotech Inc. feels their strength is in the industrial waste water treatment and fish hatchery markets of which India presents an enormous opportunity. As the market in India expands, U.S. Biotech foresees the likelihood of expanding it's production capacity by installing a number of additional fermentation tanks.

VI. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The parties concluded that the U.S. Biotech products were well suited to the Indian market place and success could be easily demonstrated at one or more of the pilot demonstration sites selected by Premier Ziba. The two specific obstacles that remain involve the mandatory and regulatory clearances required by the Indian government to import the product and financing for the pilot demonstration sites.

The issue of clearance by the Indian government should be resolved by mid September as Premier Ziba has employed a consulting firm (Biotech Consortium Ltd.) familiar with the process within the Department of Biotechnology. The Indian Department of Biotechnology has already contacted U.S. Biotech Inc. directly for data on its products and will soon be requesting samples for analysis at Indian federal laboratories.

The simplest and most direct method of obtaining revenue from industrial clients in India requires successful demonstration. As both companies are small, neither can afford independently or jointly to fund a pilot demonstration study at one or more of the selected sites. U.S. Biotech Inc. is prepared to provide the material at R&D cost and Premier Ziba is prepared to provide the personnel to implement the study. However, the major cost is not the purchase and transportation of an initial stock of product, but rather the cost of independent sample analysis to be done by a third party. Premier Ziba has requested CTP Inc. investigate grant or conditional loan programs from the U.S. Government (i.e. State OES, EPA TIES, etc.) to pursue these pilot demonstration projects.

RECOMMENDATIONS

At this point, funding for pilot demonstration sites is the key to moving this business relationship forward. As such the following major action items were developed at the conclusion of the June 21, 1994 meeting:

- Obtain mandatory and regulatory clearances (Premier Ziba Sept. 1994)
- Obtain funding for pilot site demonstrations (All Summer Fall 1994)
- Implement field demonstrations (Premier Ziba Jan 1995)
- Build industrial customer base (Premier Ziba Spring 1995)
- Approach ICICI for TEST Funding and implement late stage manufacturing function at Premier Ziba manufacturing facility (Premier Ziba / ICICI September, 1994 implementation Fall 1995).

Premier Ziba hopes to continue the collaboration and data exchange with U.S. Biotech Inc. in order to bring bio-augmentation technology to India for environmental cleanup.

APPENDICES

Appendix A

ITINERARY

Monday June 20, 1994

8:00 AM Premier Ziba Party departs from Washington for Newark

11:00 AM U.S. Biotech arrives at Sheraton Conference room.
Fred Santiate Sr, President U.S. Biotech Inc.
Richard Holmes, Director New Markets U.S. Biotech Inc.
Govind Srivastava, Managing Director Premier Ziba Ltd.
L. Srivastava, Environmental Division, Premier Ziba Ltd.
S. Diesh, Chief Scientist, Premier Ziba Ltd.
Tom Fergus, President CTP Inc.

Corporate profiles:
U.S. Biotech (R. Holmes)
Premier Ziba (G. Srivastava)
CTP (T. Fergus)

1:30 PM U.S. Biotech: Products Introduction

2:30 PM U.S. Biotech :International Marketing Strategies and Goals

3:30 PM Premier Ziba: India Market Outlook, Strategies, Goals.

4:30 PM CTP: U.S. Government Funding Options and Outlook

5:15 PM Formal Distribution Agreement and Licensing Signing
G. Srivastava
F. Santiate

5:30 PM Summary. Adjourn for Dinner.

Tuesday June 21, 1994

9:00 AM Technical Application of the Formulations.

9:30 AM Aeration Methods

10:00 AM Qualitative and Quantitative Testing Mechanisms and Techniques

11:00 AM Implementing Maintenance and Training Programs for Industrial Customers in India.

11:30 AM Discussion on local manufacturing options

1:15 PM Guerrilla Marketing Tactics (R. Holmes). How to generate rapid revenue stream to expand customer base.

Wednesday June 22, 1994

10:00 AM Premier Ziba Party meets with Environmental Protection Agency
Mark Kasman, International Activities West Tower Suite 800
401 M St SW Washington D.C. Waterfront Metro Stop
202 260-8199 x 0424 or 8466

Grant Program due by September 1, 1994 for fiscal 1995

1:30 PM Premier Ziba Party meets with U.S. EXIM BANK
McPhearson Square Metro Stop
Office of Business Development
Mr. Jerry Solomon or Arthur Pilser
202-566-8981

4:00 PM Premier Ziba Party meets with U.S. Agency for International Development
Ms. Ngoc Le, Asia Specialist, Center for Trade and Investment Services
Foggy Bottom Metro Stop
State Department Annex 2 202 663-2660

Thursday June 23, 1994

10:00 AM Premier Ziba Party meets with U.S. State Department Bureau for Oceans and International Environmental and Scientific Affairs Room 7831, 2201 C St NW. Foggy Bottom Metro.
Mr. Mike McCabe regarding Grant proposal.

2:00 PM Premier Ziba Party meets with Mr. Jeff Hallett and Ms. Emily Harwit of Sanders International, 1616 P Street Suite 410 N.W. 202 939-3480
TEST Program discussion and business plan presentation to ICICI.
Trip Report requirements

Appendix B

CONTACT INFORMATION

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WEC/US-AEP

Environmental Business Exchange (EBE) Trip Reports

Febuary 22, 1995

Trip Reports as per Cooperative Agreement (CA) AEP-0015-A-00-2055-00 in Support of the U.S.-Asia Environmental Partnership

EBE ID#	EBE DATES	TITLE OF TRIP REPORT
INDI-1I	11/7-23/93	Oil Absorbent Demonstration
INDI-1K	12/6-29/93	Review of Incinerator Operations, Indian Thermal and Cyno Clean
INDI-2	4/23 - 5/6/94	Review of Pollution Prevention Control Technology in the Textile Industry
INDI-5	4/30 - 5/10/94	Clean Coal Technology Evaluation
INDI-1P (1&2)	5/94-8/94	Clean Technology for Paper Mills - Esvin - Parts 1&2
INDI-1R	6/18-30/94	Evaluation of Biological Formulations for Industrial Wastestreams Treatment (Premier Ziba)
INDI-1Q	6/18-7/1/94	Indian Boilers Manufacturers' Association Trade Mission
PHIL-8	9/27-10/6/94	Technical Assistance on H2S Gas Abatement Systems (PNOC)
HONG-1	10/23-11/9/94	Coleman Energy and Environmental Systems Technology Transfer
KORE-1	12/9-22/93	Fuel Gas Desulfurization Technology Assessment (KEPCO)
INDI-1L	1/17-2/23/94	Corporate Environmental Mission (IT Corporation Exchange)
INDI-4	3/11-30/94	Evaluation of CS_2 Recovery in Rayon Mills