OMAN GREEN AWARDS 2011

NOMINATION FORM

Instructions for completing the nomination form:

1. Please use a separate Nomination Form for each award category.
2. You may attach extra paper as necessary
3. In the event you attach photographs, Statistical Tables and Reports to support your nomination they should be clearly labeled and marked
4. Please note that it is mandatory to provide two independent referees for the Nomination to be considered.

Organization Details:

Organization Name	BAUER Nimr LLC
CR No.	1060641
Organization Type (Business/NGO/Gov)	BAUER Nimr LLC is an environmental service provider located in Muscat, Oman. The focus of the company lies in remediation of contaminated water and soil.
Website	www.bauerenvironment.com
Location /Address	P.O. Box 1186, P.C. 114 Al Mina, Muscat, Sultanate of Oman

Contact Detail:

Title	
Name	Alexander Dittmar
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Award Category The Green Innovation Award

Project Details:

Project Title Nimr Water Treatment Plant

Location of Project Located within the vicinity of PDO's oil and gas production facilities at Nimr.

One Line Description of Project Commercial scale produced water treatment using wetlands to reduce the environmental impact of oilfield operations.

Effectiveness

What were your goals? Successful treatment of produced water from oil fields using wetlands to degrade hydrocarbons and reduction of waste water quantity using an evaporation pond, thereby reducing the amount of contaminated water disposed using deep disposal wells.

How have you measured your success? Since 28th November 2010 "produced" water has been flowing from the nearby Nimr Oilfield into the largest reed bed treatment plant in the world with an area of 235 hectares (the Nimr Water Treatment Project). The plant is currently treating around 45,000 m^3 of contaminated water every single day, achieving a level of purification in excess of 99.5 percent by using a oil-water separation technique, constructed wetlands and evaporation ponds.

Innovation & Creativity

How were innovative methods, strategies or ideas applied? The innovative method utilized is the reed bed treatment for degradation of hydrocarbons in the water after the physical separation of oil and water by skimming. Natural bacteria in the soil, which cohabit with the reed plants, degrade the hydrocarbons without producing any hazardous by-products.

The reed bed treatment strategically provides for use of plants that are indiginous to Oman (and therefore capable of surviving the harsh environmental conditions at the site, also posing no threat to other

indigenous species). In addition, the facility is topographically designed to allow gravity to power the flow of water from one treatment area to another, a simple but very energy efficient method of operating. As a result, high energy consuming equipment is not required at the water treatment site.

Finally, another simple and non-energy consuming process, natural evaporation, is used to reduce the volume of water at the end of the process, reducing the environmental impact of the residual contaminated water.

Impact

How has the project/initiative/work motivated others to contribute to a greener Oman

The initial success of the facility in operations has generated interest within Petroleum Development Oman to increase the capacity and scale of the water treatment plant, and works are currently underway to begin a second phase of construction to double the capacity to treat up to 95,000 m3 water/day.

There are currently pilot plans in various stages of discussion to explore the use of this technology to treat other types of waste water, including sewage, by other companies, including hotel and construction companies.

Originality and Leadership

How has the nominee demonstrated vision, foresight and persistence?

BAUER Nimr has pioneered the translation of an existing research-scale technology for water treatment into a commercially useful scale method for decontamination of water. BAUER Nimr's vision was to bring this technology to commercial scale in order to reduce the amount of environmental pollutants generated during the oil production process. Multiple laboratory scale experiments were required to determine the optimal conditions for degradation of hydrocarbons by the reed bed soil bacteria, and BAUER Nimr developed techniques to replicate those conditions on a commercial scale at the site of the water treatment plant.

The methods and techniques were further customized to the environment of the Nimr oil fields and the requirements of PDO. It is important as well that BAUER Nimr's vision included the use of indigenous plants to minimize any unforeseen impact of the technology of the natural flora and fauna, and care was taken to both implement this vision and monitor the environmental impact of the plant on the local flora and fauna.
BAUER Nimr provided the full funding to build the Nimr Water Treatment Plant and in doing so invested itself heavily in the technology.

Continuity & Sustainability

How sustainable is the initiative carried out?

The water treatment plant is sustainable from two perspectives. The first is that indiginous species of reeds were used in building the plant, which can survive the harsh desert environment of the site with a minimum of upkeep. Secondly, a key parameter of the facility design included the use of the local topography to ensure gravity driven water flow, allowing the system to operate with minimum power requirements.

Compared to the standard technology for disposal of produced water, deep disposal wells, the wetland plant uses only 1/50 of the energy, which includes all infrastructure and facilities, which translates directly into a substantial reduction of Carbon emissions.

Explain how it will be effective in the long term

The Nimr Water Treatment Project is a facility to remediate residual waters from the Petroleum Development of Oman (PDO) oil wells in the Nimr Oil field. The project was designed to have an operational phase of 20 years or more. An initiative to expand the facilityto increase capacity up to 95,000 m3 water treatment per day is currently in process. In addition to the elimination of the need for deep disposal wells at the Nimr site, BAUER Nimr's vision is that the technology, now proven, can be customized and implemented at the sites of other oilfields belonging to PDO and potentially other petroleum companies. If the technology can be customized to other sites and becomes commercially attractive to international oil companies, the environmental impact of the reed bed system may be very significant on a global scale.

In order to increase the commercial attractiveness of the technology to PDO, additional efforts are underway to develop a salt works facility adjacent to the Nimr Water Treatment Plant in order to use the salt

produced in the water treatment process of a quality that it can be reused for other commercial purposes. In addition, preliminary efforts are underway to determine whether the reed bed biomass from the facility that would otherwise be considered as waste product can be developed for use as a bio-fuel.
Finally, BAUER Nimr is exploring the potential for the system to qualify under the Clean Development Mechanism (CDM) program of the United Nations to generate Certified Emission Reductions (CER), commonly known as carbon credits, which would increase the commercial value of the system.

Referee Details: (mandatory)

Referee 1:

Title

Name: *Paul Sharples*

Organization: Ministry of Environment & Climate Affairs

Position/Designation *Expert*

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Referee 11:

Title

Name: *Simon Wilson*

Organization: *Five Oceans Environmental Services LLC*

Position/Designation *Technical Director*

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REMARKS : _____

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