

| PERF Proposed Projects | | | | | | | |
|------------------------|--|--|--|-----------------------------------|-----------------|-----------------|---|
| Number | Project Name | Status (Idea, Pre-Proposal, Proposal, On-Going, Completed) | Brief Description | Type of Project (funded, sharing) | Company Leading | Contact | Others Interested/Involved |
| 2010-07 | Understanding Biodiesel in TPH | Pre-proposal | Presentation during the 2010 remediation workshop | Funded | Chevron | D. Kong | BP, TestAmerica, Shell, ExxonMobil, Petrobras, TOTAL |
| 2010-06 | Air Emissions Cooperative | Pre-proposal | Emissions inventory, gap analysis, data sharing, wastewater treatment emissions (API), PM 2.5, method development, | Funded (contractor) | BP | Dave Fashimpaur | Repsol, Total, Saudi Aramco, Chevron, Statoil, ExxonMobil |
| 2010-05 | Sensor System for Detection and Prediction of Floating Roof Failure in Petroleum Storage Tanks | Pre-proposal | To increase the safety of floating-roof tanks, the project aims to develop and test a wireless sensor system that can be installed permanently on the floating roof of an open top AST to alert the tank operator when accident warning signs are detected. This system will be comprised of intelligent distributed sensors that will simultaneously report data from various points on a roof thereby creating an overall representation of the structure and its behaviour. Because the sensor will be operating on a remote, constantly moving structure, the device will communicate wirelessly and be capable of long-term autonomous operation. | Funded | TBD | TBD | Total, Chevron, ExxonMobil, Saudi Aramco, ConocoPhillips, PetroCanada / Suncor, Husky Energy, Syscor Controls |
| 2010-03 | Drilling waste best practices/guidance" - World Bank High Level guidance, OSPAR, lenders | | Following PERF meeting which took place in London on April, 2010, (15) PERF members and consultants have shown interest in participating in the proposed PERF project 2010-03 "Drilling waste best practice/guidance". The objective of the project is to develop comprehensive guidelines, available to all international drilling operators, for the management of Drilling and Workover wastes. These guidelines should build upon existing guidance documents from API, UNEP, etc. A power point presentation describing the project idea, type, objective and scope was prepared and emailed to potential project members. After consolidating all of the members' comments, a conference call was conducted on September 20th, 2010. The level of interest and the type of contribution whether cost, information or hybrid were discussed through several emails. A second conference call will follow once the type of contribution of all interested companies is determined. | | SaudiAramco | Ramzi Hejazi | BP, TWMA, Tullow Oil, ExxonMobil, Chevron, ERM, M-I SWACO, Advantek international, Tullow Oil, Repsol, URS, Petrobras, Acorn International, Xodus Group |

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| 2010-02 | "Cl- in Cuttings, Drill and Base Fluids" - | Pre-proposal | Future API committee formed - potential for PERF help to fill in gaps of what API will do and what we need to know. E.g. How to do the mud testing for chlorides in cuttings from drill fluids, based fluids <ul style="list-style-type: none"> • NADF – w/out salt – evaluation of, Cl free cuttings • Any update exist of 1995 API manual? • Eco testing of powder from TCC or other process itself | | ExxonMobil Development Co | Brent Estes | Halliburton, Petrobras, Chevron, TWMA, Performance Fluid Mgmt, M-I SWACO, Repsol |
| 2010-01 | Road Map for testing new cuttings treating technology performance | Pre-proposal | TCC Hammermill, Liquid Gas Extraction (LGE),etc, size footprint, age of infrastructure, env.impact <ul style="list-style-type: none"> - LGE - On-site treatment technologies - How are these units used at sites - onshore/offshore | | Halliburton | Tim Harvey | Petrobras, Transocean, Tullow Oil, ExxonMobil, Chevron, TWMA, Tullow Oil, Performance Fluid Management, Statoil, M-I SWACO, Saudi Aramco, Repsol, Shell, Xodus Group |
| 2009-06 | Hg project : Developing Best Practices/ Guidance document for Sampling and Analyzing Hg in all media, technology evaluation for removing metals from wastewater - Se,Hg, Base scientific review of fate and transport of Hg at a refinery | Pre-proposal | better understanding of behavior in refinery stream, slugs of Hg, look upstream | | Chevron or ExxonMobil | Thomas Hoelen or Chad Shockley | Veolia water, Saudi Aramco, Chevron, Shell, Syncrude, TNO, BP, urs, Shell, Vito, Questoir, Argonne, Clemson University, University of Saskatchewan |
| 2009-05 | Research on Treatment Technologies for Water Use and Beneficial Reuse/Sharing of Refinery Water Reuse Projects & Applications | Pre-proposal | compilation of lessons learned, costs / checklist, best practices development, beneficial use water "quality" for various processes in the target industry, water quality monitoring (QA/QC) and how to control (analytical), what are the effects of using different water quality? "Fit for purpose/use", water quality library, incl discharge limits) | Sharing | Chevron or ExxonMobil | Veronica Blackwell or Jill Kerr | TNO, Veolia Water, BP, URS, Argonne, Chevron, Repsol, University of Houston, Saudi Aramco, Shell, DHV BV, Vito, Questor, Clemson University, University of Saskatchewan |
| 2009-04 | Sheening associated with Contaminated Sediments | Pre-proposal | Understanding sheening associated with petroleum contaminated sediments | TBD | Chevron | Will Galla | ExxonMobil, Anchor QEA, U/Texas, BP, TestAmerica, Project Navigator |

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| 2009-03 | Constructed and restored wetland and phytoremediation | Proposal | Sharing of best practices and lessons learned | Sharing | Chevron | Jim MEYERS | ExxonMobil, BP, Test America, Project Navigator, Chevron, |
| 2009-01 | Performance Evaluation of In-situ Chemical Oxidation of Petroleum Impacts in Groundwater | Active | Use of Chemical Oxidation (ChemOx) at the Interface Between Permeability Contrasts in Aquifers to Reduce Contaminant Emissions to Groundwater from Hydrocarbon Residuals in Lower-Permeability Zones | Sharing & Funded | ExxonMobil | Scott Bushroe or Chad Shockley | Chevron, Shell, BP, Exxon, Aramco, URS, GES, and AquiferSolutions |
| 2008-02 | Novel Technologies for Sensing BTEX | Proposal | There is a huge potential to reduce future groundwater monitoring analytical costs and improve site characterization by deployment and remote monitoring of sensitive, inexpensive, selective chemical sensors. Currently such chemical sensors are not commercially available. | Funded | ExxonMobil | Chad Shockley | None |
| 2008-01 | Next Generation Optical Sensors for Gas & Vapor Detection | Proposal | To develop cost-effective colourimetric gas sensors tailored for particular industrial applications. Specifically, to develop sensor compounds that change colour upon exposure to specific gases. targets analytes may be: 1,3-butadiene, HF, H2SO4, HCl, SO2, NOx, CO, CO2, O2, H2S, NH3, benzene. | Funded | BP | Dave Fashimpaur | QUESTOR, ExxonMobil, Chevron, PetroBras, RepsolYPF, Shell, Total |
| 2007-07 | EU Refinery Assessment | Proposal | Perform an assessment on refinery wastewater effluent substances that are the focus of EU legislation (i.e Water Framework Directive (WFD) & European Pollutant Release & Transfer Register (EPRTR)). The objective of this project is to build a comprehensive database of effluent quality to inform the petroleum industry and provide benchmarking opportunities. The project will use results and guidance of a CONCAWE project studying effluent sampling techniques and analytical test methods of these targeted substances. This project will aim to identify substances of regulatory concern that are non-detectable in refinery effluents as well as those detected which may be of future study. | | ExxonMobil | Frank Kerze | BP |
| 2007-05 | Membrane Bioreactor Demonstration | On-going | Evaluation of membrane bioreactor (MBR) technology as a competitive alternative to conventional activated sludge systems. Includes complete pilot scale testing of MBR at refinery. | TBD | ExxonMobil | Ryan Couture | Chevron, BP, Total Others... |