PARIMASE S.A.

Pacific Risk Management Services

Christopher Gale, CFO/EPM
President

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Quienes Somos
Who We Are

- A diverse collection of international consultants
- Focused on Remediation and Bio-Remediation Services
  - Industrial Waste Water and Petroleum Operations
- Provide consultation and project management
- Manufacture Oil Clear products in Ecuador for distribution to South America

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Que Ofrecemos
What We Do

Servicios

- *Medio Ambiente*
- *Protección Contra Incendios*
- *Seguridad*
- *Manejo de Emergencias*
- *Servicios de Manejo de Riesgos*

Services

- Environmental Management
- Remediation
- Bio Remediation
- Waste Water Treatment
- Sub-Surface Injection Treatment
- Heavy Metal Process Reductions
- Air Pollution

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Oil Clear Remediation

- Non-Toxic, Non-Ionic Surfactant, Non-Hazardous, 100% Biodegradable
- Used for organic oils ranging from hydrocarbons to vegetable/fish oil by-products
- Treatment is performed in-situ or ex-situ
  - Sub-Surface Treatment Injections
- Waste Water, Contaminated liquid or enhanced soil remediation/bio-remediation treatments
- Petroleum, Industrial, Maritime, Aviation or Commercial

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Oil Clear Capability

- Decreases water tension from 70 dyne to 30 dyne – Significant enhancement for oil/water solubility
- Significant increase in bio-availability of organic molecule for:
  - Bioremediation
  - Oxidation/Reduction
  - Physical Separation Treatment (Oil Recapture)
- Increased operation performance in waste water and soil treatment
  - Reduction in operational costs
  - Faster treatment process in either small or large applications
  - Approximately 95% reuse of treated and processed materials

Oil Clear Solubility

Coagulated Waste
Vegetable Oil

Heavy Crude Oil

In Water Solution

In Oil Clear Solution

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Surfactant Classifications

- Anionic: They have one or more negatively (–) charged groupings. They have very good detergent ability and are commonly used as laundry detergent.

- Cationic: They have one or more positively (+) charged groupings. They typically have poor detergency, but are well suited for use as germicides, fabric softeners, and emulsifiers.

- Amphoteric: They contain both anionic and cationic groupings (– & +) and have the characteristics of both anionic and cationic SAA. They work well at neutral pH and are found in products such as hair shampoo, skin cleaners, and carpet shampoo.

- Non-ionic: As their name implies, they have no ionic constituents or groupings. They are the largest single group of SAA and have a correspondingly wide range of chemical characteristics and application. Oil Clear surfactant mixtures, are non-ionic and have the unique ability to selectively desorb contamination (LNAPL, DNAPL's, PAH, PCB, DCE, TCE, PCE), etc.

- *Ionic Surfactants make up >99% of the surfactants used around the world.*

- *In this regard Oil Clear is very unique.*

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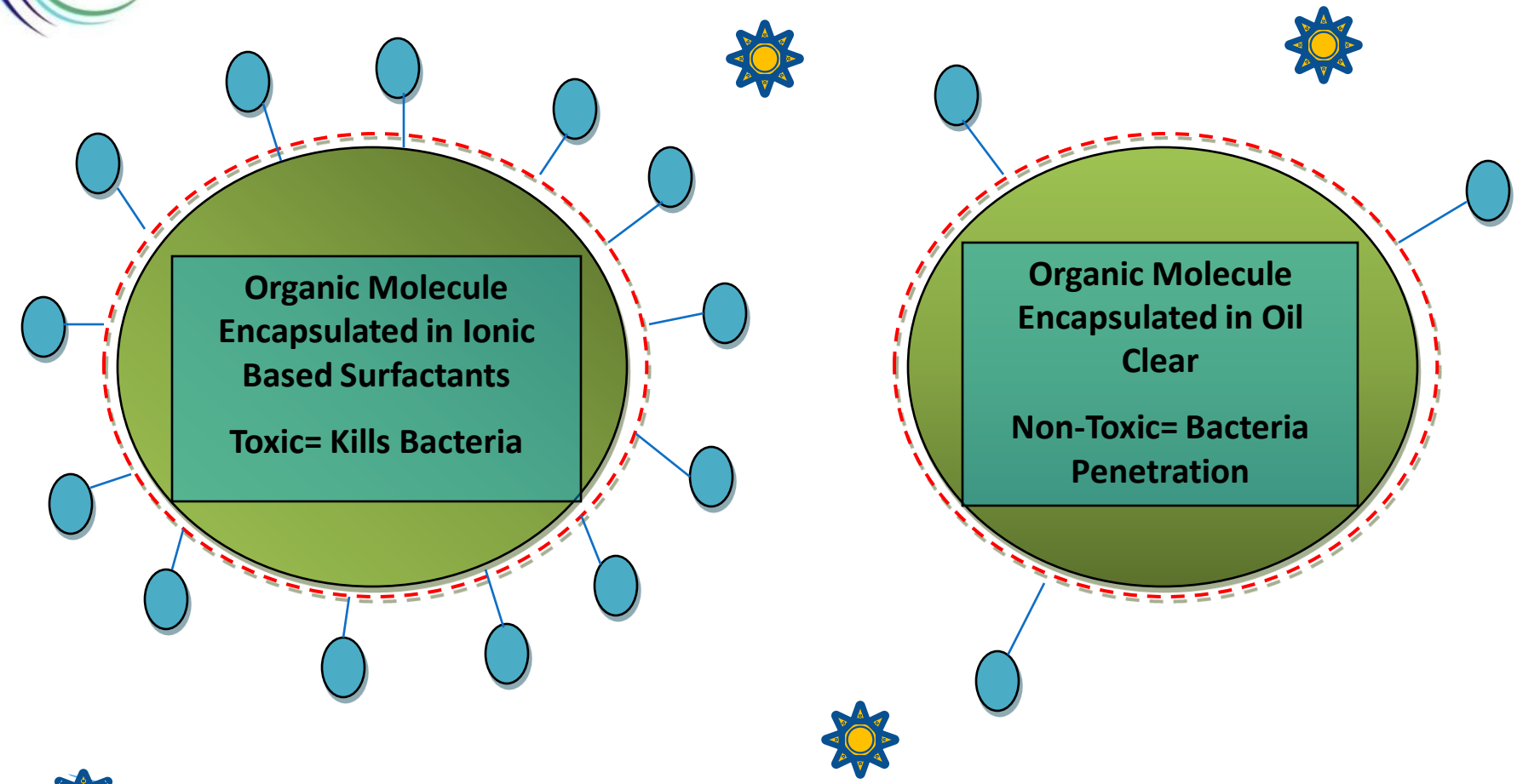
Bio-Availability Key



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Surfactant Enhanced Soil Washing of Oil and Gas Wastes Tank Bottom Sludge, Drilling Cuttings, Oil Sands and Impacted Soils With Associated Oil Recovery Opportunity Wastes
North and South American Case Studies

Presenter
George (Bud) Ivey
, B.Sc., CES, CESA, P. Chem.
President and Senior Remediation Specialist
Ivey International Inc.

17th International Petroleum & BioFuels Environmental Conference
San Antonio TX
August 30 to September 2, 2010

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Soil Washing

Surfactant enhanced soil washing (SESW) remediation, is a remediation process that combines the use of specialized surfactant formulations with physical washing (i.e., soil washing) of oil contaminated solid wastes within a three phase system (i.e. soils, water and contaminants).

Traditionally, soil washing used heated water only with limited effectiveness due to sorption limiting the '*physical availability*' of contaminants.


STOCKPILER

This presentation will introduce you to surfactant enhanced soil washing (SESW) of higher molecular mass contaminants associated with up stream and down stream oil and gas contaminants.

The#1 Limiting Factor To Solids Remediation!

SESW can achieve four (4) principle objectives:

- reduce the volume of water required for soil washing;
- allow for potential recovery of liberated PHC;
- generate a clean solids meeting regulatory objectives;
- provide a clean rapid and cost effective alternative to conventional soil washing.

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FACT

>95 % of Organic Petroleum Hydrocarbon Contaminants Are Absorbed or Adsorbed (Sorbed) To Particles In Soil, Sediments, Bedrock, Drilling Wastes, and Solid Waste

.

Contaminant Sorption Limits The `*Bio- Availability*` of Contaminants For All Forms of Remediation!

.

Sorption Is The #1 Reason Why Many In-situ and Ex-situ Remediation Project Are Slow, Costly and/or Fail!

Generally speaking, the lower the water solubility of a contaminant the greater it tends to sorb to the soil, sediments, and bedrock, drilling mud, sludge, frac-sand, colloidal solids, and negatively affects contaminant 'availability'
for remediation.

Hence, sorbed contaminants are less '*bio-available*' for
in-situ or ex-situ P&T, Soil Washing, Bioremediation, Chemical Oxidation/Reduction.

Oil sorption hinders primary and/or secondary oil recovery in oil fields all around the world…


WASTE Oil Lake Dump in Argentina

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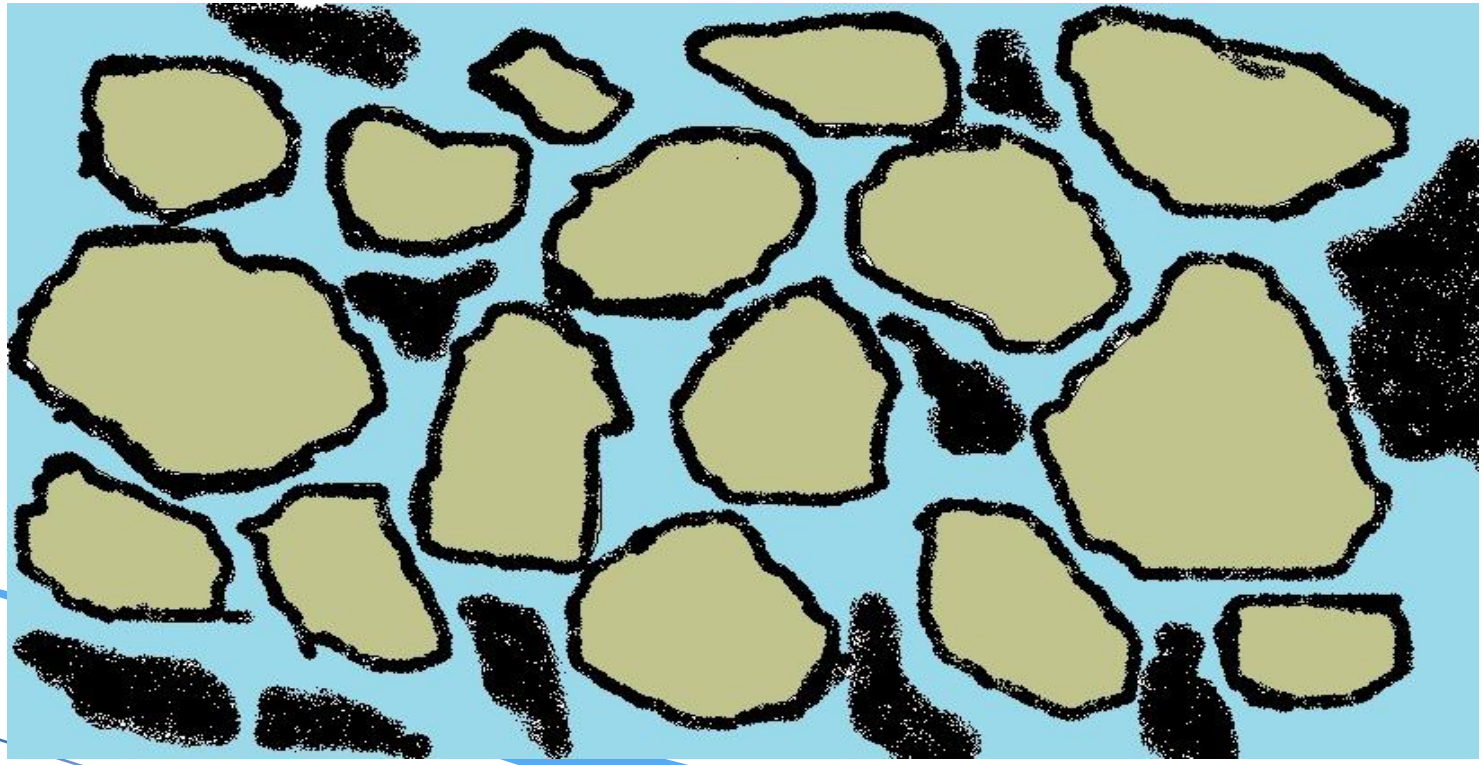
Sorption

Sorption (i.e. absorption or adsorption) of Contamination in Soil, Sediment, or Groundwater Matrix

Soil & Groundwater Remediation Must Address This To Be Successful.



Particulate | Water | Oil

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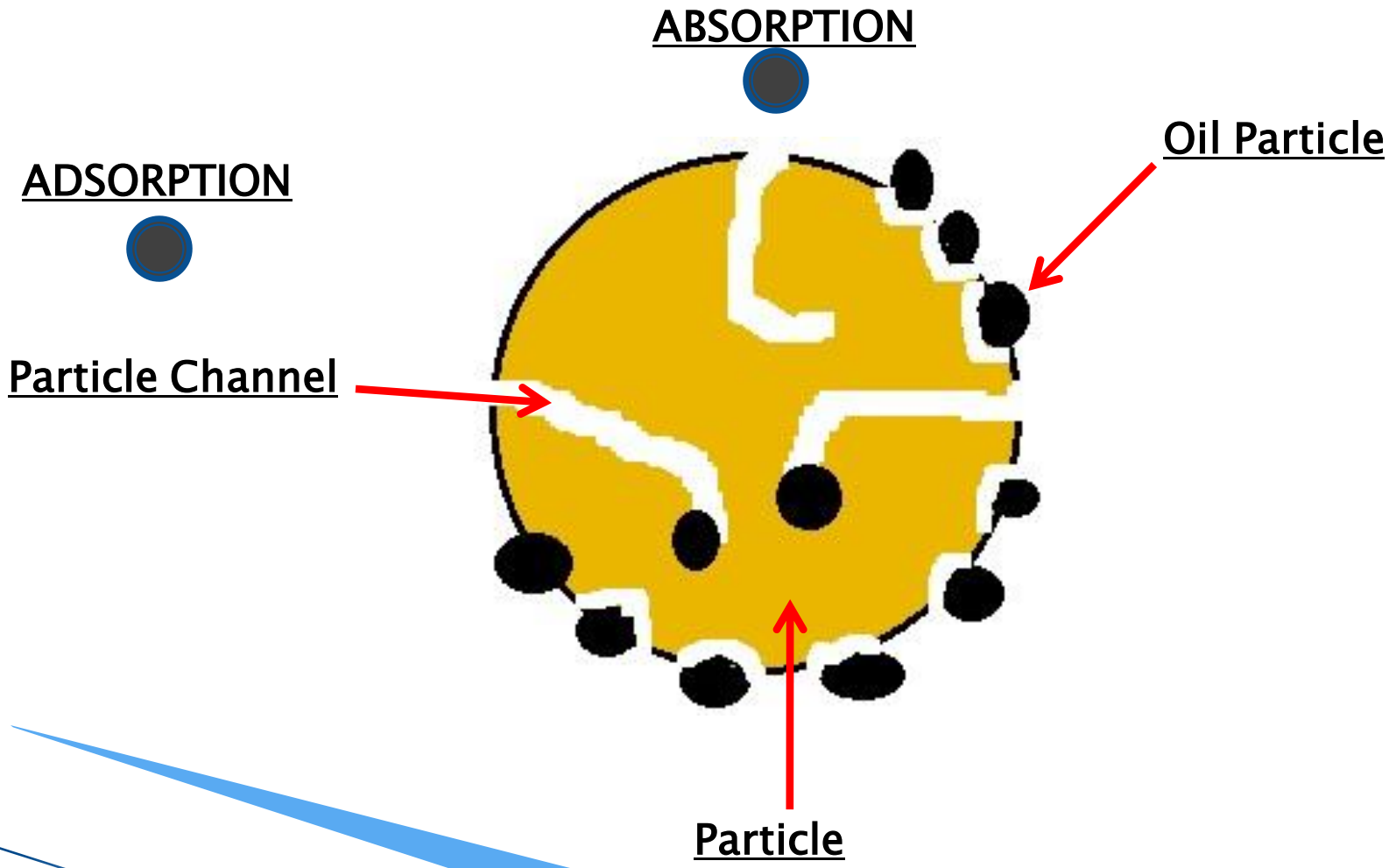
Absorption –VS– Adsorption



Generally Speaking

Contaminant Sorption Is Inversely Proportional To Contaminant Availability Remediation

Hence

Hydrocarbon Sorption Potentials

F4 > F3 > F2 > F1
(Bunker-C > Motor Oil > Diesel > Gasoline)

Hydrocarbon Physical Availability For Remediation
F1 > F2 > F3 > F4

Hydrocarbon Remediation Rates
F1 > F2 > F3 > F4

SESW can make all fractions available!

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FACT

Contaminant Sorption Limits the '*Physical Availability*' of Many Hydrophobic Contaminants For In-situ and Ex-situ Remediation!

Contaminants Must Be 'Bio-Available' For All Forms of Remediation To Be Effective!

Remember the Conventional Surfactant Demo

Heavy Waste Dump Soil /Liquids

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FACT

Sorption Is The #1 Reason Why Many In-situ and Ex-situ Remediation Projects Are Slow, Costly and/or Fail

Hydrocarbon Sorption Potentials

F4 > F3 > F2 > F1

Hence soil washing of mid to heavy petroleum hydrocarbons with water will not be effective…so lets lean why Ivey-sol non-ionic surfacts enhace soil washing!

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To better understand soil, sediment, drill cutting, frac-sand, and solid waste remediation, one needs to revisit their understanding of *water*…and it's role in contaminant *sorption*…

This understanding of water holds a key for the successful clean-up of contaminated soil, sediments, and groundwater…

and how Non-Ionic *Surfactants can be a valuable tool in your Remediation Tool Box!*

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Availability of Contamination

Contaminant 'availability' is quickly becoming a new driving force for the evaluation of in-situ and ex-situ remediation options for air, soil and groundwater remediation.

Examples:

'Bio-Availability'	***Bioremediation***
'Chemical Availability'	***Oxidation/Reduction***
'Physical-Availability'	***P&T, Soil Washing, Oil Recovery…***

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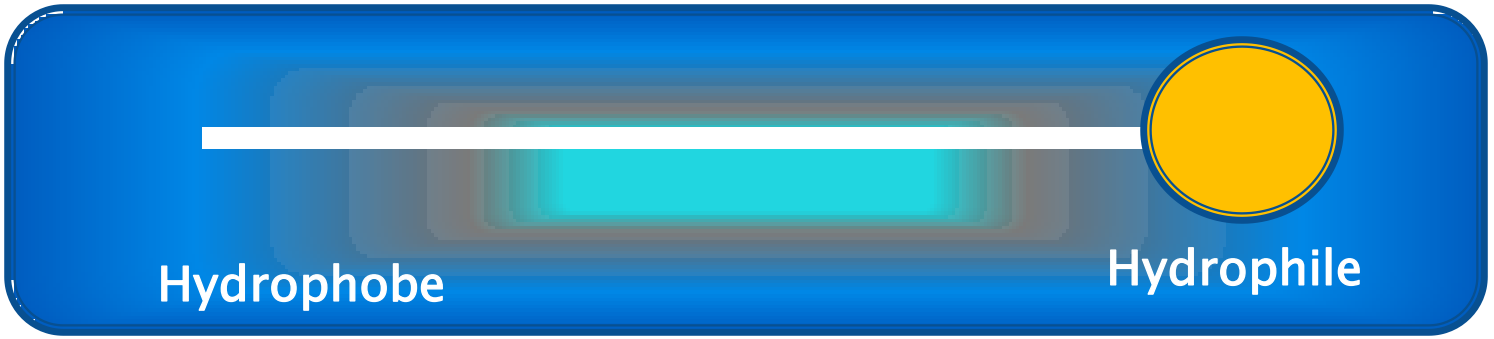
Fine Grain Soils Red Deer Alberta Clay

Soil & Surface Area

- 1 cubic inch of gravel = 30-40 cm^2 area (+/-)
- 1 cubic inch of sand = 300-950 cm^2 area (+/-)
- **1 cubic inch of fine clay = Foot Ball Field Area!!!**

The finer the soil matrix, the more surface area for contaminants to absorb/adsorb onto, and the harder for water to penetrate...Ivey-sol Oil Clear can overcome these limitations...

Surfactant Chemical Structure



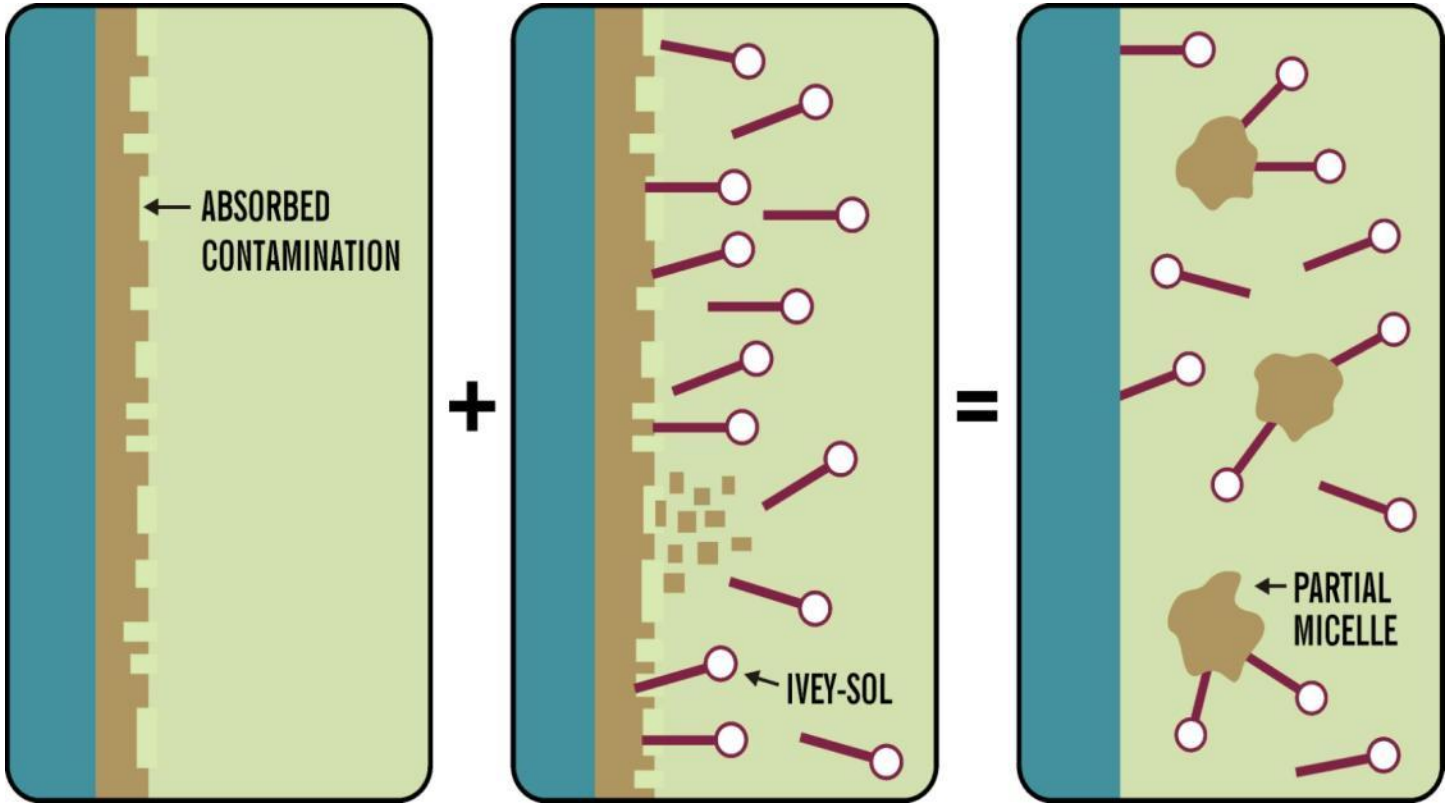
Hydrophilic (water loving) and Hydrophobic (water hating oil-liking) Groupings Allow For Surface Interaction With Many Contaminants

Ivey-sol Oil Clear Surfactants Can Lower The Surface Tension of Water From 72 Dynes to <30 dynes

This increases the wetting ability of the water (makes water clusters smaller) when present.

The Ivey-sol® surfactant application is possible in finer grain soils to improving Water Permeability (K) to aid increasing contaminant availability for remediation.

MECHANISM



Ivey-sol Interaction With Oil On A Surface With Partial Micelle Encapsulated of Oil Droplet (Ivey-sol is Effective Below The CMC)

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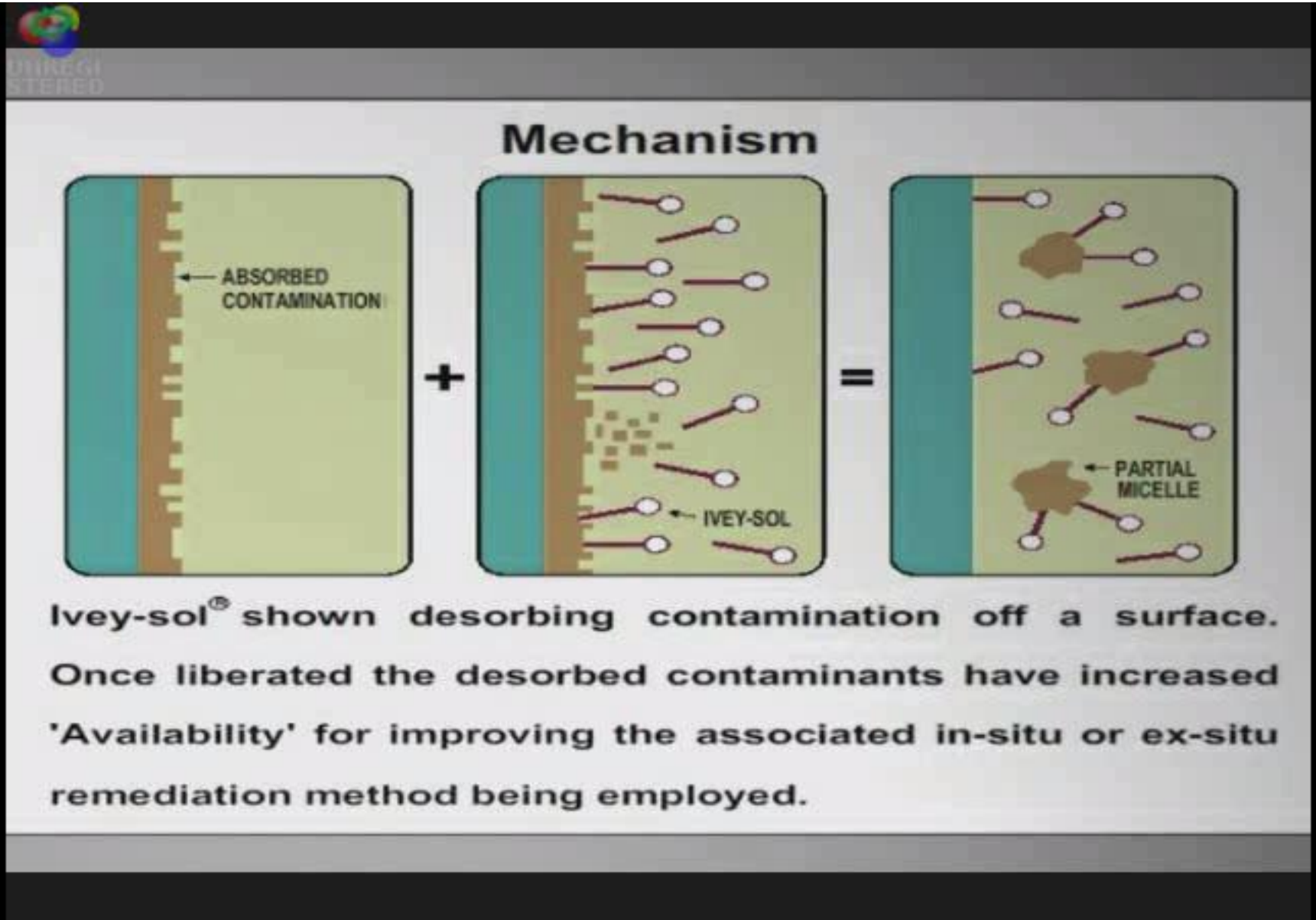
Oil Clear Video



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APPLICATION RANGE

LNAPL

Full LNAPL (F1,F2, F3, and F4) Range Including: BTEX, Gasoline, Diesel, Motor-Oil, Bunker-C, MTBE, PAH's, etc.

DNAPL

25 Fold (+) Increase In Solubility & Recovery Rate. This includes Compounds Like: PCE, PCB, TCE, TCA, CTC, TCM, PCP, & Various other Cl/Br Solvents

Heavy Metals

Transition metals, including organo-metalic complexes, and radio-active metals associated with NORMS.

Fuel-oil – Bunker-C – Gasoline Dissolved In Water With Ivey-sol

Ex-situ Examples


STOCKPILER

Soil Washing


Refinery Site > 2000 Tons Soil of Mid to
heavy-end hydrocarbon contamination

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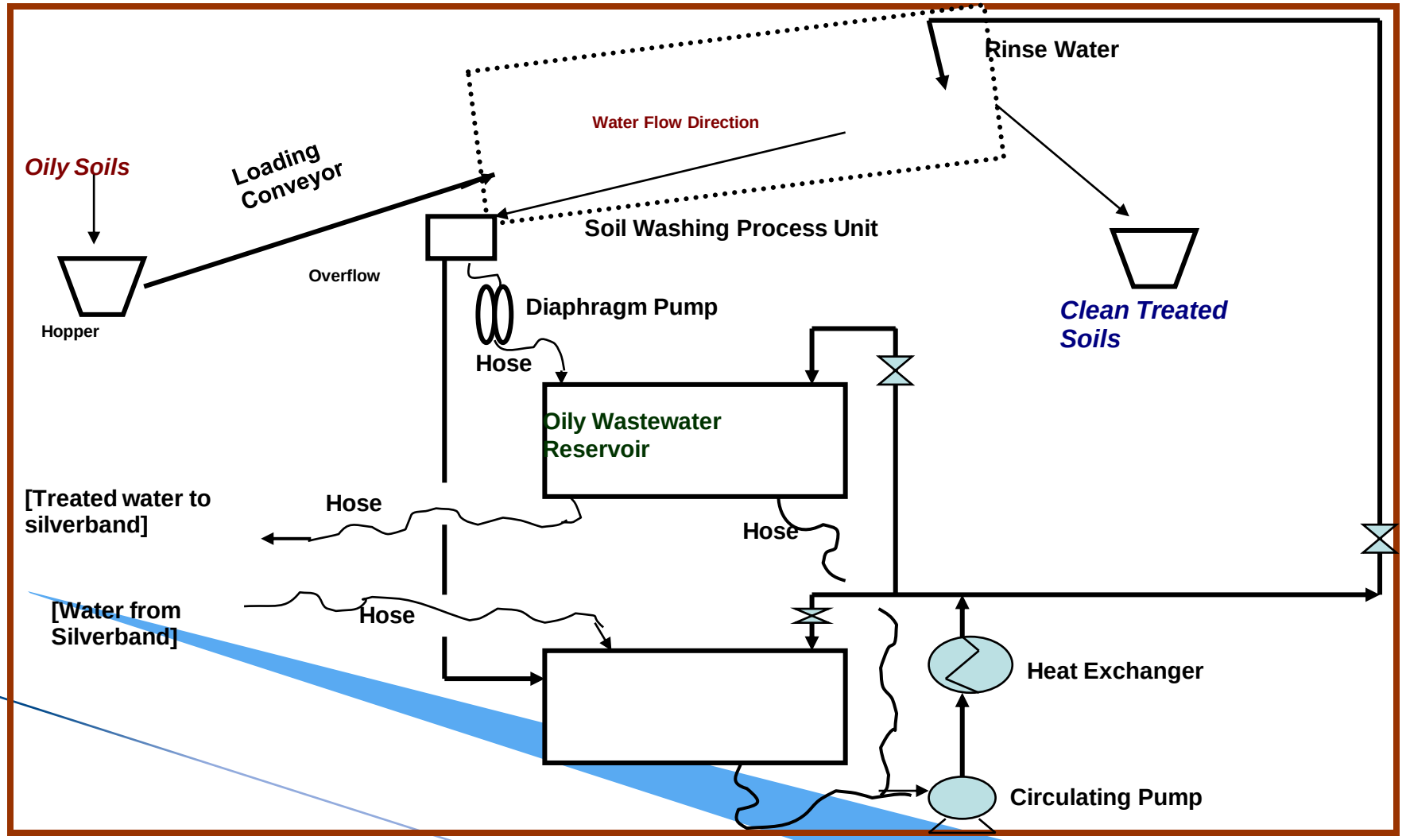
SER Ex-situ Soil Washing System



Baseline

Mineral Oil & Grease 40,580 ppm

Alberta Canada Oil Refinery Site (>5000 Tons)

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Contaminated soil with a baseline concentration of 40,000 ppm (4%). Ex-situ Ivey-sol Soil Washing SER Process achieved applicable soil remediation site objectives.
Project data set provided below showing pre and post soil washing remediation results
with time based sample analysis.

Soil Parameter	Base Line	5 Minutes	7 minutes	Reductions
CCME F1 C6-10	72 ppm	< 1 ppm	< 1ppm	100%
CCME F1 BTEX	71 ppm	< 1 ppm	< 1ppm	100%
CCME F2 C10-16	417 ppm	35 ppm	21 ppm	95%
CCME F3 C16-34	13, 600 ppm	1,600 ppm	826 ppm	94%
CCME F4 C34-50	5,060 ppm	512 ppm	259 ppm	95%
CCME F4 C34-50+	13,000 ppm	571 ppm	290 ppm	98%

Note: *CCME = Canadian Council of Ministers for the Environment. From CCME Soil and Water Clean-up Guideline Parameters.*

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Pre and Post Ivey-sol Treatment, Vancouver BC Effective Removal of Heavy-end Hydrocarbons.

Contaminated Soil Tumbler Chamber – Contaminated Soil in Background

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Ex-Situ Soil Treatment Sydney Australia

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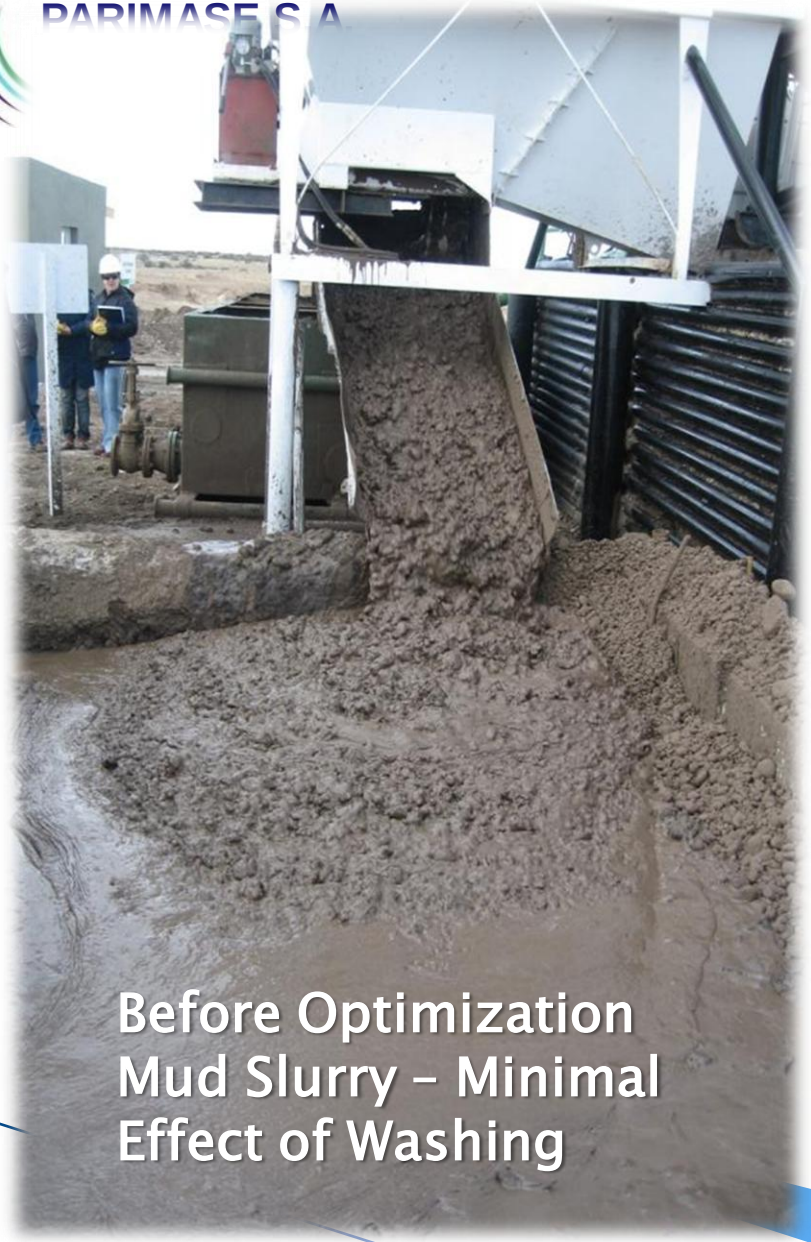
Client Soil Washing Treatment System



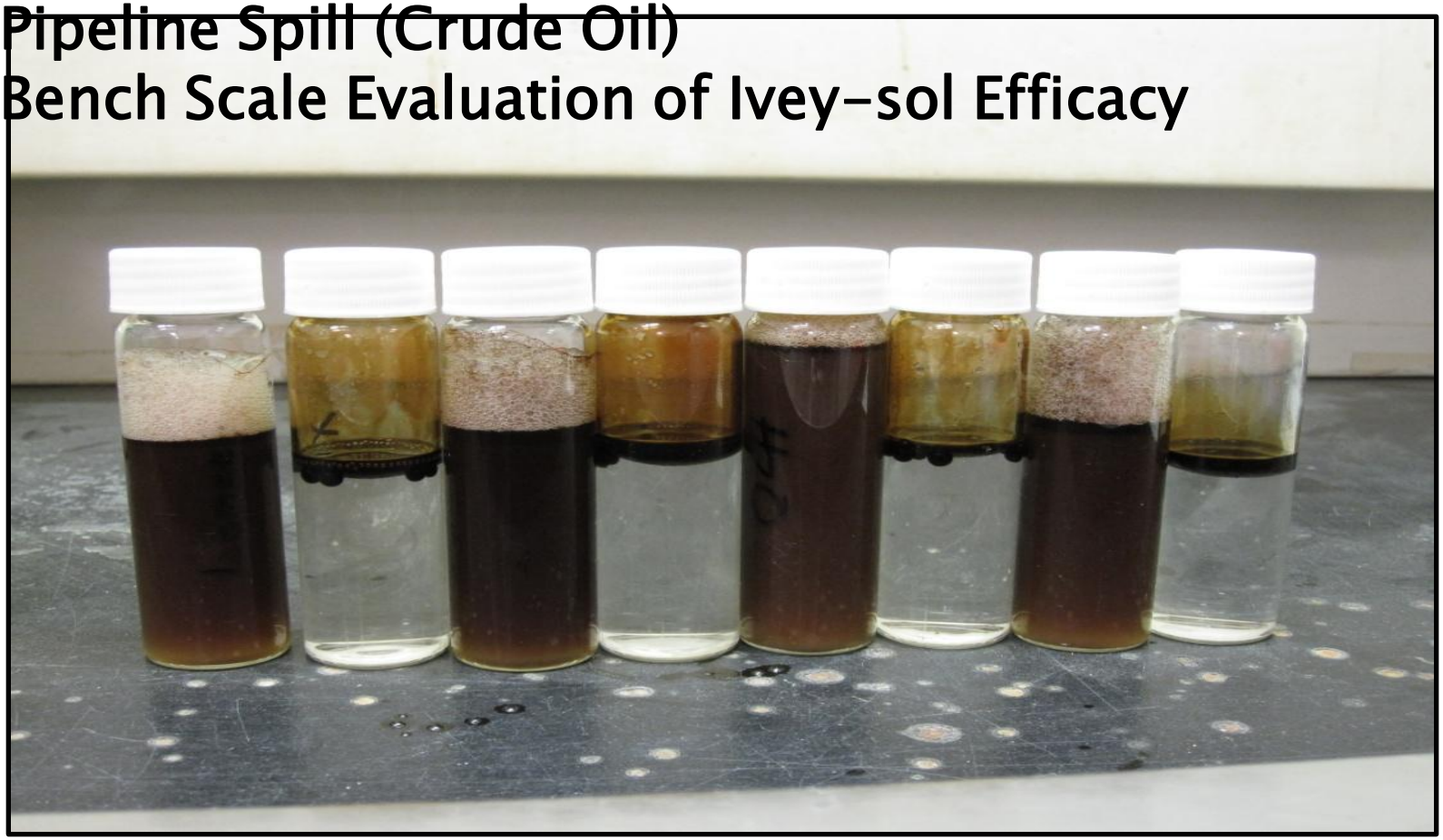
Before Optimization
Mud Slurry – Minimal Effect of Washing

After Optimization

After Optimization

Solubility Factor

Pipeline Spill (Crude Oil)
Bench Scale Evaluation of Ivey-sol Efficacy



Fraction	Baseline	Post Ivey-sol	% Increase
EPH (C10-C19)	16.1 ppm	422 ppm	2,621.12%
EPH (C19-C32)	13.0 ppm	229 ppm	1,761.54%

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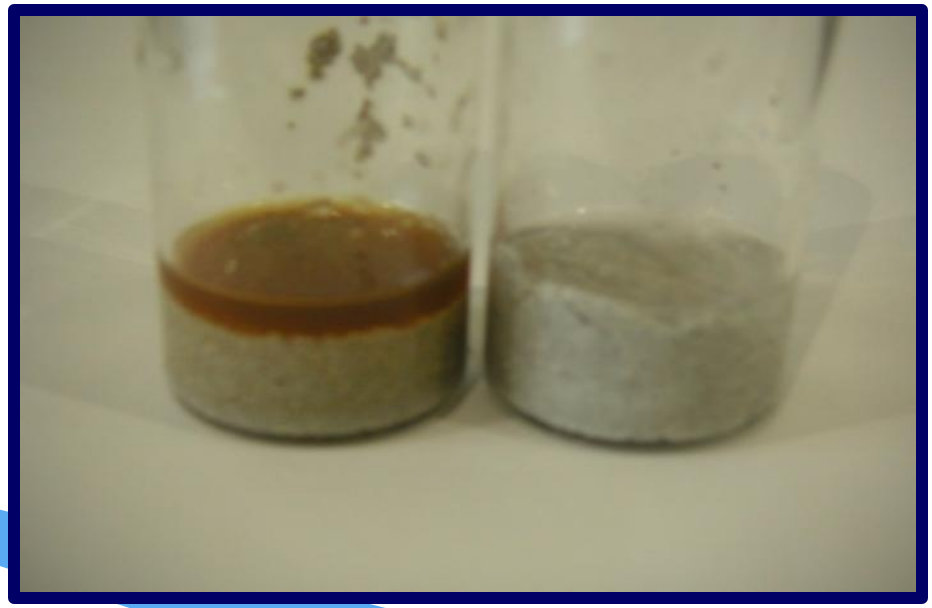
Oil & Gas Well Frac-Sand Waste Treatment (Ivey-sol®)

Sample From Alberta, Western Canada



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Before and After Dispersant Shore Line Clean-up – Exxon Valdiz Spill

1989 - Exxon Valdez 40,000 tons of oil spilled

Heavy Toxic Ionic Surfactants Used

1999 – Soil Cleaning was so toxic, plant was not able to grow after "clean-up"

CONCLUSIONS

SESW is a viable and cost effective method for remediating petroleum hydrocarbon contaminated solids.

SESW is a new remediation method that confirms the ability of Ivey-sol surfactants to increase the 'Physical Availability' of contaminants for Soil Washing.

Ivey-sol surfactants can increase the availability of contaminants to improve all forms of in-situ and ex-situ contamination.

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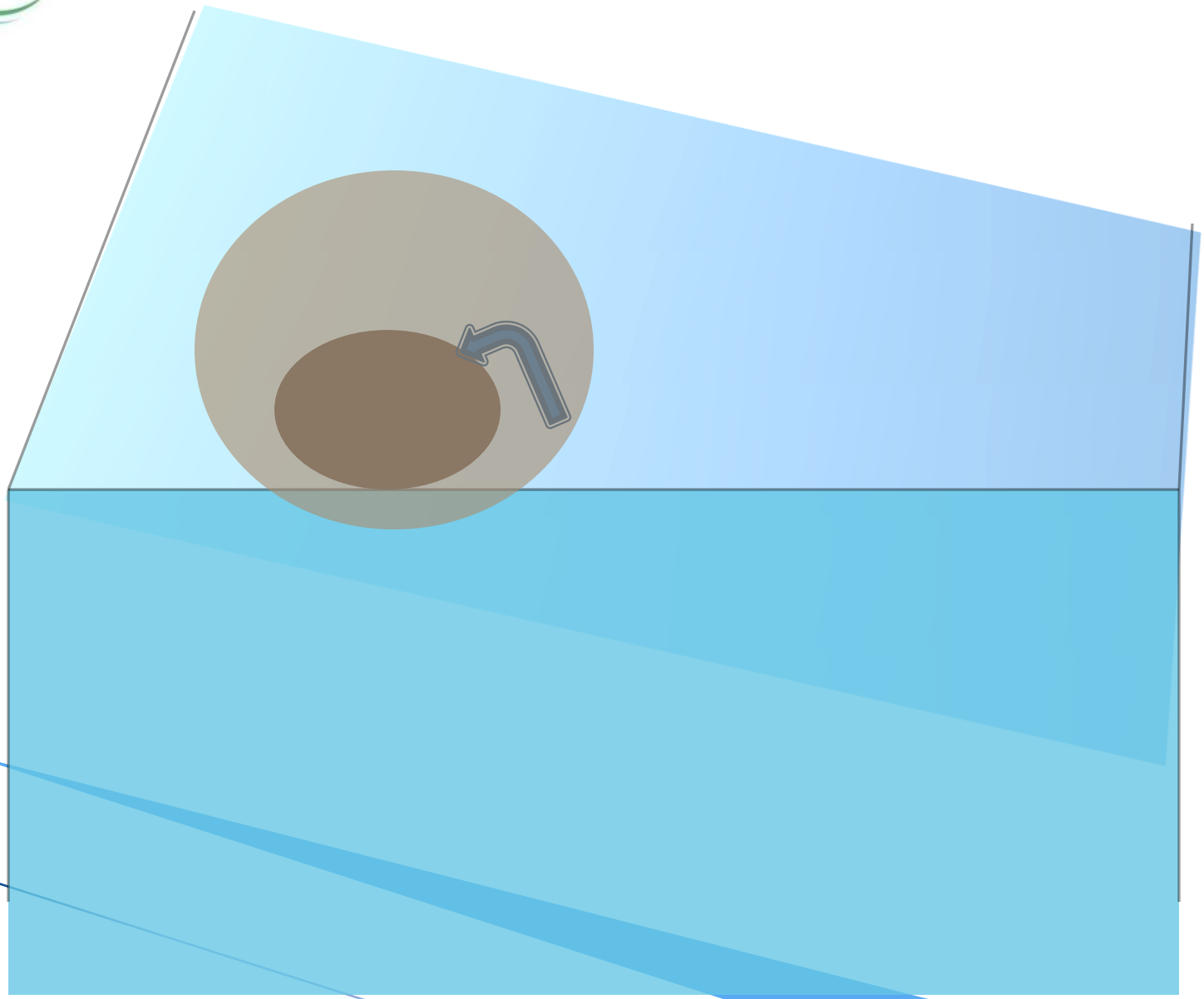
Ocean Dispersion – Conventional Ionic Surfactants – Sea Klean



Ocean Dispersion – Oil Clear Technology

Natural Bacteria Breakdown of Oil

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Waste Water Remediation

- Utilizing the injection of Oil Clear components into a waste water treatment system, it will improve discharge flow. This is accomplished by decreasing particulate matter contamination and reduction of overall particulate size.
  - This allows for better operational performance.
  - Dramatically aids in oil recapture from waste water processes.
  - Reduces maintenance costs and system “plugs”

- System design change and/or alternation may be necessary as older technology may not meet today’s processing demands.

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Benefits of Oil Clear in Waste Water Treatment

- Improved treatment capacity.
- Significant reduction in coagulated greases and oils.
  - A leading cause of system disruption
- Faster oil/water separation.
- Recaptured oil can be reprocessed faster as unwanted particulates are separated which may cause filtration plugs.
- Treated waste water can be processed for reuse.
- Financial incentives for system efficiency
  - Internal to your company
  - Possible Government Environmental Incentives – Dependent upon laws

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Ivey-sol® Oil Clear Services

- On site consultations for existing, current and/or emergency spill remediation and/or bioremediation response.
- Provide waste water systems designs and treatment products.
- Conduct sub-surface injection wells to treat ground contamination as well as additional oil recovery processes from existing well sites.
- Perform tank farm fuel storage clean-out for decommissioning or reuse.
- Provide emergency open water dispersion response.
- Provide air contamination reduction products.
- Produce Ivey-sol® Oil Clear in Ecuador for distribution to South America.
- Provide technical support and training as required for client.

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Informacion de Contactos
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