

# Kuwait Environmental Remediation Program

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RemTech 2020

Restoring Kuwait Treasures  
**KERP**  
KUWAIT ENVIRONMENTAL REMEDIATION PROGRAM



## Outline

- KERP Background
- UNCC Claims
- Contaminated Features
- UXO Site Clearance
- KERP Projects

# Kuwait Environmental Remediation Project

## KERP – KOC Claim Awards under UNCC Decision 258

### Claim No. 5000259

*(Coastal & Marine Resources)*

### Claim No.5000450

*(Remediation of areas in and around wellhead pits and Tarcrete)*

### Claim No. 5000454

*(Remediation of areas damaged by oil lakes, oil-contaminated piles, oil trenches & oil spills)*

# Kuwait Environmental Remediation Project

## KERP – Contaminated Features

- The main KERP features:
- Wet oil lakes
- Dry oil lakes
- Oil contaminated piles and
- Tarcrete





## Wet Oil Lake



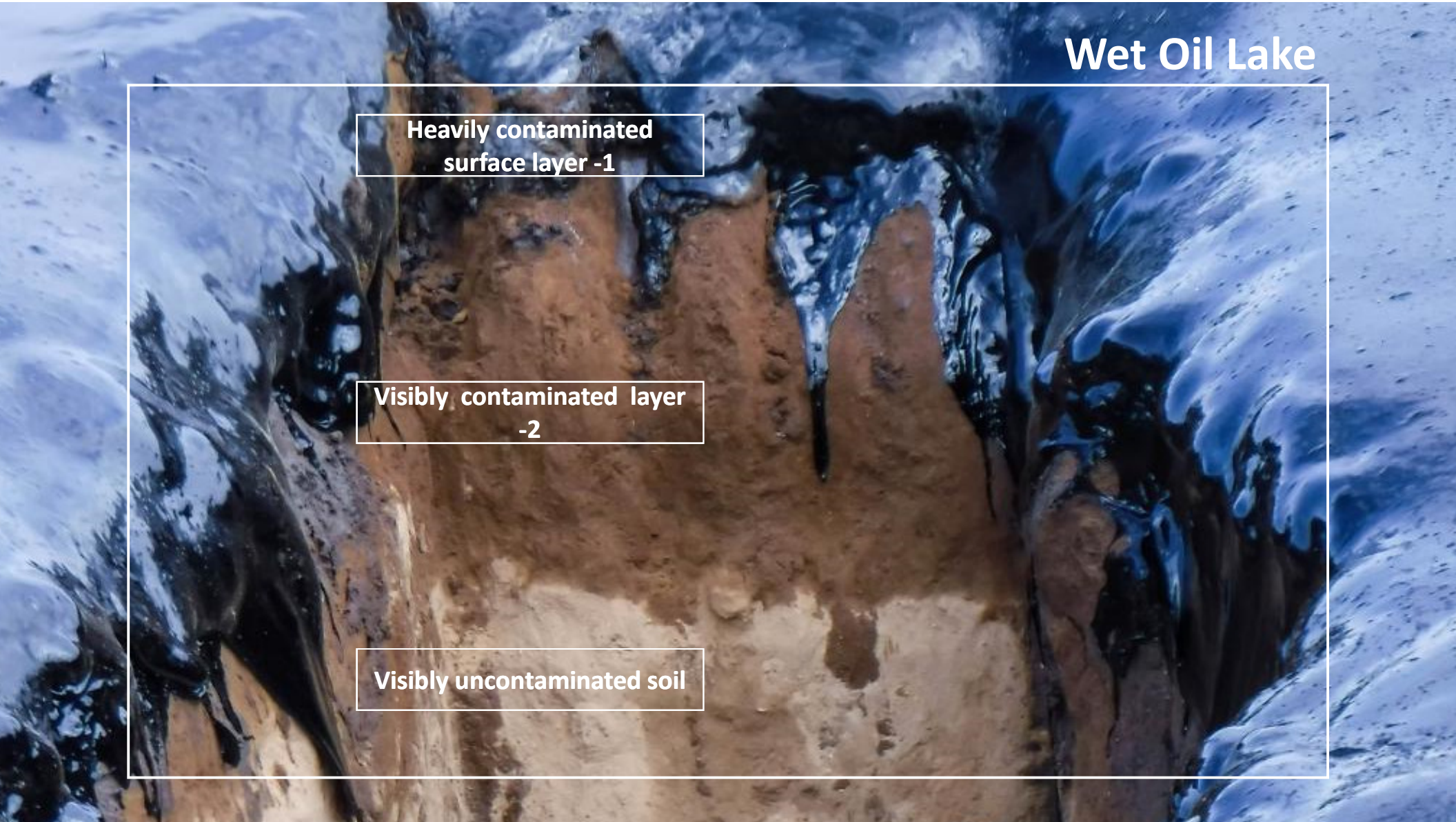


## Wet Oil Lake

Heavily contaminated  
surface layer -1

Visibly contaminated layer  
-2

Visibly uncontaminated soil





## Dry Oil Lake





## Dry Oil Lake





## Oil Contaminated Piles









# Tarcrete





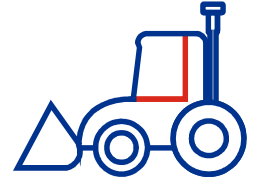
# Tarcrete





# Kuwait Environmental Remediation Project

## KERP – UXO Site Clearance

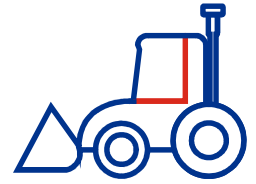




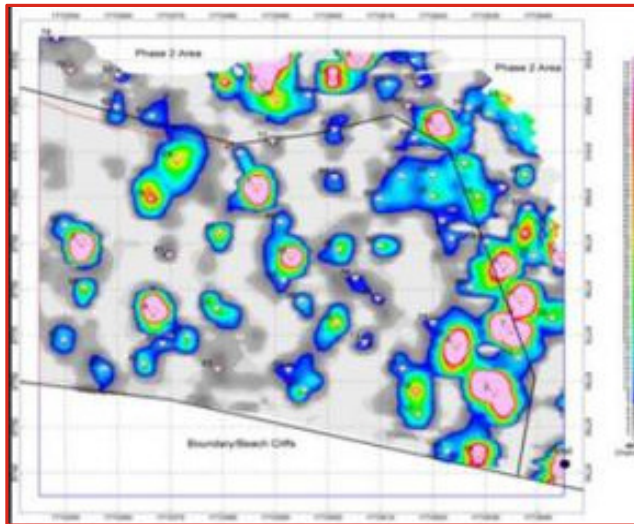
# Kuwait Environmental Remediation Project

## KERP – UXO Survey & Clearance

### Digital Geophysical Mapping



EM 61 Towed array



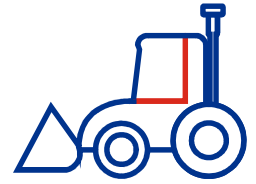
DGM Map

Geophysical Dig Sheet and Target History									
Project Information					Dig Sheet Information				
Name	Location	Date	Time	Operator	Sheet No.	Sheet Date	Sheet Time	Sheet Operator	Sheet Results
EXPLOMAG SYSTEM	Phase 2 Area	2008/08/08	10:00	John Doe	101	2008/08/08	10:00	John Doe	101
EXPLOMAG SYSTEM	Phase 2 Area	2008/08/08	10:00	John Doe	102	2008/08/08	10:00	John Doe	102
EXPLOMAG SYSTEM	Phase 2 Area	2008/08/08	10:00	John Doe	103	2008/08/08	10:00	John Doe	103
EXPLOMAG SYSTEM	Phase 2 Area	2008/08/08	10:00	John Doe	104	2008/08/08	10:00	John Doe	104
EXPLOMAG SYSTEM	Phase 2 Area	2008/08/08	10:00	John Doe	105	2008/08/08	10:00	John Doe	105
EXPLOMAG SYSTEM	Phase 2 Area	2008/08/08	10:00	John Doe	106	2008/08/08	10:00	John Doe	106
EXPLOMAG SYSTEM	Phase 2 Area	2008/08/08	10:00	John Doe	107	2008/08/08	10:00	John Doe	107
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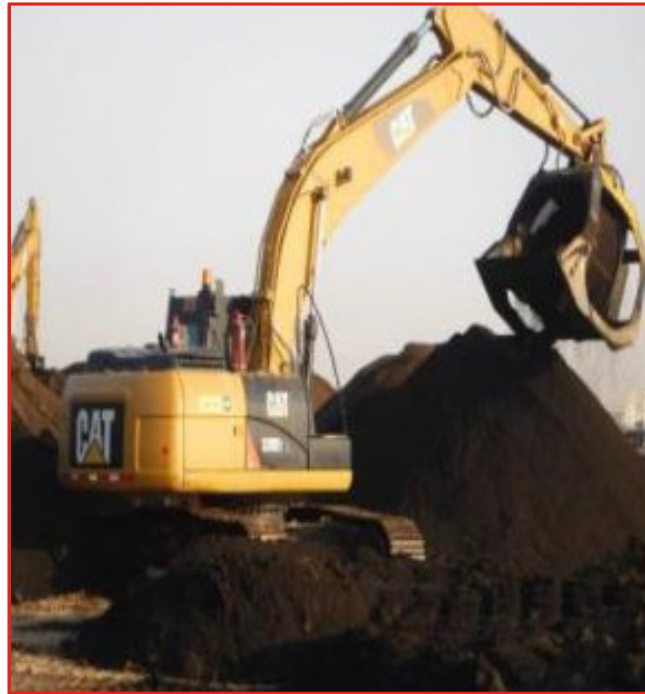
Geophysical Dig Sheets

# Kuwait Environmental Remediation Project

## KERP – UXO Survey & Clearance



Mechanical Screening Sifter



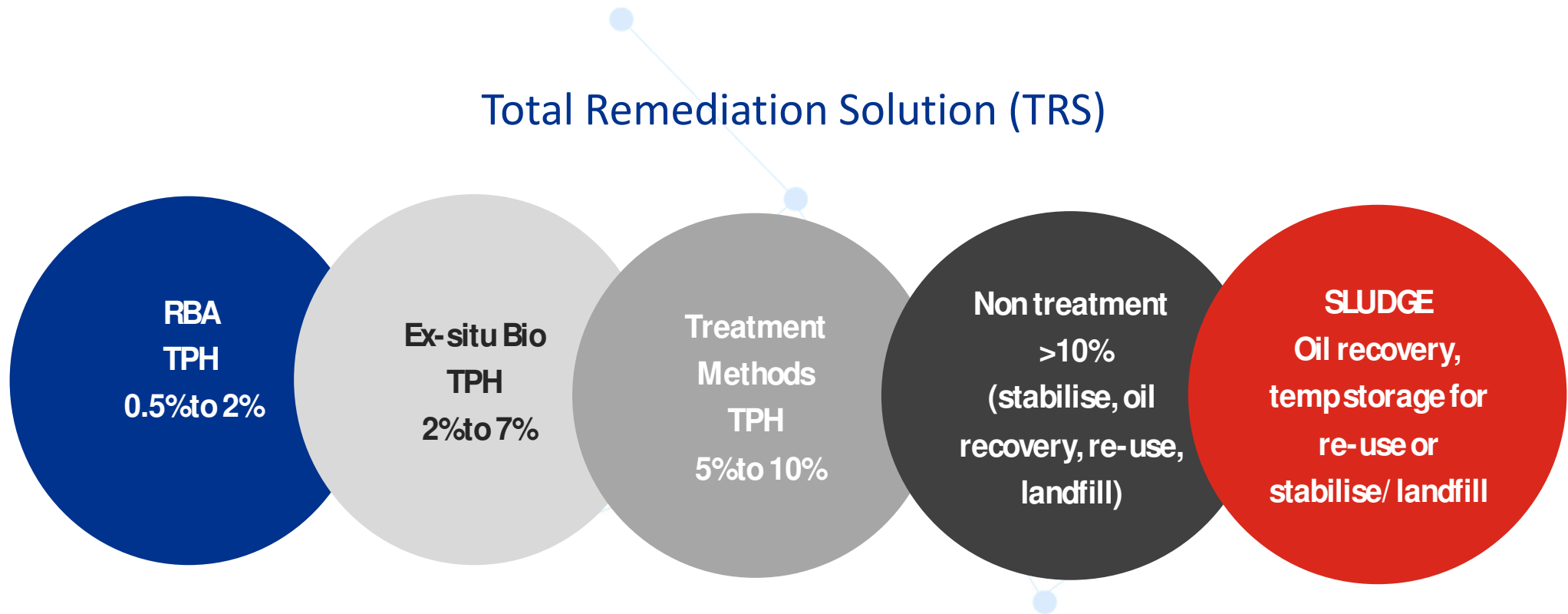
Mechanical Screening Buckets



Battle Area Clearance

# Kuwait Environmental Remediation Project

## KERP – Strategy





# Kuwait Environmental Remediation Project

## KERP – Achievements: Coastal Trench

- Released Land = 8,571 m<sup>2</sup>
- Volume compacted to landfill = 5,981 m<sup>3</sup>



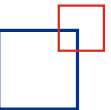
Before



During



After



# Kuwait Environmental Remediation Project

## KERP – Achievements: Well head pits

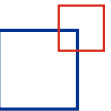
- 163 Well-Head Pits ( 65 in North Kuwait & 98 in South East Kuwait)
- Released Land = 74,588 m<sup>2</sup>
- Volume compacted to landfill = 179,112 m<sup>3</sup>



Before

During

After





# Kuwait Environmental Remediation Project

## KERP – Achievements: Dry Oil Lakes

- Released Land = 4,304,338 m<sup>2</sup>
- Volume compacted to landfill = 487,012 m<sup>3</sup>

Before



Dry Oil Lakes

During



Dry Oil Lakes

After



Dry Oil Lakes

# Kuwait Environmental Remediation Project

## KERP – Achievements: Wet Oil Lakes

- Released Land = 1,190,667 m<sup>2</sup>
- Volume compacted to landfill = 814,981 m<sup>3</sup>

Before

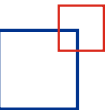


30.11.2015 11:11

After



25.12.2016 10:29



# Kuwait Environmental Remediation Project

## KERP – Achievements: Oil Contaminated Piles

- Released Land = 329,563 m<sup>2</sup>
- Volume compacted to landfill = 192,903 m<sup>3</sup>

Before

During

After





## Re-Vegetation

**Rhanterum epapposum**, or locally called **Arfaj**, the plant, became the national flower of Kuwait in 1983



QA





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