

OIL SPILL RESPONSE LTD  
(OSRL)

Shoreline Clean-up



# Shoreline Impacts

- 💧 Many different types of shoreline
- 💧 Different environmental conditions lead to different species which leads to varying levels of sensitivity
- 💧 Differing shorelines require differing clean-up techniques



Sources: IPIECA

# Shoreline Types & Sensitivities



# Environmental Sensitivity Index

	1A Exposed rocky shore		8A Sheltered scarps in bedrock, mud or clay and sheltered rocky shore
	1B Exposed, solid man-made structures		8B Sheltered, solid man-made structures
	1C Exposed rocky cliffs with boulder talus base		8C Sheltered riprap
	2A Exposed wave-cut platforms in bedrock, mud or clay		8D Sheltered rocky rubble shores
	2B Exposed scarps and steep slopes in clay		8E Peat shorelines
	3A Fine- to medium-grained sand beaches		9A Sheltered tidal flats
	3B Scarps and steep slopes in sand		9B Vegetated low banks
	4 Coarse-grained sand beaches		9C Hypersaline tidal flats
	5 Mixed sand and gravel beaches		10A Salt and brackish water marshes
	6A Gravel beaches (granules and pebbles)		10B Freshwater marshes
	6B Riprap structures and gravel beaches (cobbles and boulders)		10C Swamps
	7 Exposed tidal flats		10D Mangroves

Source: NOAA

# Shoreline Impacts

## Rocky Shore (1A)

- Shoreline split into zones dependant upon exposure
- Different species can tolerate different exposure levels



## Sandy Shore (3A or 4)

- Not as obviously as other shorelines
- Burrowing organisms
- Oil may filter down into the sediment



# Shoreline Impacts

## Tidal Flats (9A, 9C)

- 💧 Very sensitive
- 💧 Support a vast number of plant and animal species
- 💧 Substrate easily eroded
- 💧 Mangroves or other vegetation may grow in the upper intertidal zone



## Mangrove (10D)

- 💧 Very sensitive
- 💧 Provide habitat for wide variety of organisms
- 💧 Oil impacts trees by smothering roots



# What are the goals of a shoreline clean-up response?



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- 💧 To accelerate natural recovery
- 💧 Minimise the impact of the clean up operations



# SHORELINE TREATMENT



What can we do if we know there is going to be a shoreline impact?



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Shoreline before and after preimpact debris removal

## Shoreline response – three Stages

Stage 1 – Gross contamination removal – **Emergency Stage**

- 💧 Recovery of oil floating against the shoreline and bulk, pooled oil ashore

Stage 2 – Removal of moderate to heavy contamination - **Project Stage**

- 💧 Removal of stranded oil and oiled sediment

Stage 3 – Final treatment - **Polishing Stage**

- 💧 Final clean up of light contamination and oil stains
- 💧 Clean to the “end point”

# STAGE 1

Emergency Stage – Gross contamination removal



## Stage 1 – Gross contamination removal

### Why do we recover oil that is floating against the shoreline?

- 💧 Stop it contaminating new sections of coast
- 💧 Large areas of oil stranded in the tide line will refloat on the next incoming tide and may move to other areas.



# Stage 1 – oil removal options

- Methods are available for Stage 1



Booms & skimmers

## Mechanical recovery



Manual recovery

# Stage 1 – booms and skimmers

## Advantages

- 🔹 Efficient - recovered waste should have a high proportion of oil
- 🔹 Relatively small workforce required
- 🔹 Prevents the oil migrating to additional areas of shoreline

## Disadvantages

- 🔹 Requires trained responders
- 🔹 Requires specialist equipment
- 🔹 Limited by weather





# Stage 1 – mechanical recovery

## Advantages

- Rapid removal of large volumes of oil and contaminated sediment
- Uses readily-available equipment
- Small workforce



## Disadvantages

- Requires good access points
- Generates large quantities of lightly oiled waste
- Can remove significant volumes of substrate – erosion issues
- Environmental impact
- Applicable to few shoreline types

# Stage 1 – manual recovery

## Advantages

- 💧 More selective than mechanical recovery – less sediment removed
- 💧 Can utilise non-specialist local workforce (with supervision)
- 💧 Appropriate for more sensitive shoreline types i.e. mangroves

## Disadvantages

- 💧 Large workforce required
- 💧 Manual handling issues
- 💧 Duty of care to workers



## STAGE 2

Project Stage – Removal of moderate to heavy contamination

## Stage 2 - High Volume Low Pressure flushing



## Stage 2 - High Volume Low Pressure flushing



## Stage 2 – Surface and Subsurface oil removal



## Stage 2 – Surf Washing



## Stage 2 – Surf Washing



### Just 3 weeks later

- Minimal oiled waste
- Beach profile unaltered
- Reduced labour required

NEBA is an important consideration



# STAGE 3

Polishing Stage – Final treatment



## Stage 3 – Polishing Stage

- Final polish
- Removal of equipment
- Replacement of materials if required



# Things to avoid during a shoreline response



- 💧 Sterilising
- 💧 Over-cleaning



# Shoreline Considerations

- ◆ Site Set up (Hot, Warm and Cold Zones)
  - ◆ Decontamination
  - ◆ Equipment lay down areas
  - ◆ Security
  - ◆ Rest facilities etc.
- ◆ Waste Management
- ◆ Transport (Personnel, Equipment and Waste)
- ◆ PPE
- ◆ Safety Training / Risk Assessment

## Summary:

- 💧 Every response is different  
(oiling level, shoreline type, oil type, seasonal variations, clean-up techniques, etc)
- 💧 Very important to use NEBA from the outset
- 💧 Shorelines may not be as clean as the public/media may like when an end point is met

# PUBLICATIONS

**ipieca** **IOGP** International  
Oil  
Governance  
Partnership

## Shoreline response programme guidance

A technical support document to accompany the IPIECA-IOGP guidance on oiled shoreline assessment and shoreline clean-up techniques

www.ipieca.org

**ITOPF** **RECOGNITION OF OIL ON SHORELINES**

TECHNICAL INFORMATION PAPER **6**

**ITOPF** **CLEAN-UP OF OIL FROM SHORELINES**

TECHNICAL INFORMATION PAPER **7**

**IPIECA** **IOGP** International  
Oil  
Governance  
Partnership

## A guide to oiled shoreline clean-up techniques

Good practice guidelines for incident management and emergency response personnel

**Oil Spill Response**

## Shoreline Operations Field Guide

A guide to operational and monitoring requirements for shoreline clean-up operations

VERSION NUMBER: 1  
DATE RELEASED: December 2011

# Thank you

[www.oilspillresponse.com](http://www.oilspillresponse.com)

Ken Church

Aberdeen Deputy Manager

[Kenchurch@oilspillresponse.com](mailto:Kenchurch@oilspillresponse.com)

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