

# **Foreshore Assessment, Termination of Clean-up and Rehabilitation Monitoring**

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## **Introduction**

This plan was developed and endorsed by the National Environmental and Scientific Coordinators (ESC) Workshop and the National Plan Environment Working Group in 2007; it expands on the version endorsed by the ESC Workshop in 2001.

This document has three sections. Sections 1 and 2 provide guidelines for structuring a foreshore response plan, determining appropriate levels of cleanliness and conducting post-spill recovery and rehabilitation assessment. Specifically, Section 1 suggests the components of a foreshore response plan and provides guidelines to help inform decisions about cessation of active and/or passive cleaning operations. It helps identify when the potential for on-going environmental harm (or diminution of other values) is minimised. It further helps identify when the potential for rehabilitation of biological assemblages to pre-spill conditions is maximised. Section 2 is a template that Planning Section could use when providing a Report on foreshore condition at the end of the spill response.

Section 3 provides guidance about approaches to identify when environmental values and functions have been fully restored. On-going monitoring to determine when a segment has rehabilitated is strongly recommended. Determining whether any particular resource has been rehabilitated to pre-spill conditions will require a specific approach including, in most circumstances, detailed ecological assessment of impacted and reference areas.

## **Section 1 – Foreshore Response Plan**

### **Foreshore Response Plan – Environment Issues**

The Environment Unit in the Planning Section will have an important role in many aspects of the formulation of the foreshore response plan.

The foreshore response plan should cover the four points detailed below, and be updated as more information becomes available.

#### **1. Detail threatened resources and set response priorities.**

Notes:

- Initial identification of threatened resources will usually be based on information in OSRA in conjunction with aerial observations and spill trajectory modelling. This will be refined as the response continues by field observations and local knowledge.
- Habitat structure as well as biological components should be considered.
- It is important to establish protection priorities – which resources are most sensitive, needing most immediate protection and/or greatest protection effort?
- The Risk Assessment Matrix at Figure 1 provides an *example* of one method of assessing priority.

#### **2. Determine “Environmental Value” of each resource and, if possible, set quantitative or semi quantitative targets**

Notes:

- Setting the Environmental Value defines how each part of the affected environment may be impacted by the spill and therefore will determine the level of cleanliness required.
- Work by segments, and remember that some segments will have multiple values.
- Environmental Value applies more to habitats than organisms.
- Include cultural and indigenous issues.

#### **3. Work with the Operations Section to determine the best way to achieve the level of cleanliness required.**

Notes:

- Present protection/clean-up priorities to Operations and discuss various options for achieving the priority actions.
- Table 2 provides a starting point for selecting clean-up methods, but it is recommended that responders think widely and research options if necessary. If possible, test options experimentally.
- Net Environmental Benefit Analysis should be applied - response actions should not cause more harm than the spill.
- Be sensitive to cultural considerations.

#### **4. Have a formal sign-off procedure to agree that the requisite level of cleanliness has been reached.**

Notes:

- Establish a minimum list of stakeholders.
- Establish a sign-off team comprised of stakeholder representatives.
- Reinforce the agreed Environmental Values with the team.
- Section 2 of this document provides a template for the Sign-Off procedure.

- Work by segments. When Operations advises that a segment is considered clear of contamination, the sign-off team should inspect the foreshore. Determine whether Environmental Values have been achieved. Consider whether re-oiling is expected. If appropriate, sign-off on the segment.

**Figure 1.** Example risk assessment matrix to assist in setting priorities for protection and clean-up. It is based on estimated time of recovery and local percentage of that resource threatened. This matrix does not cover all issues that may affect priority. Source: Maritime New Zealand – A. Lane, 2007

			Recovery Time			
			Slow ←			→ Rapid
			>10 yrs	5 – 10 yrs	1 – 5 yrs	<1yr
			1	2	3	4
Potential Impact	Severe (>50%)	A	1A	2A	3A	4A
	Major (30-50%)	B	1B	2B	3B	4B
	Minor (10-30%)	C	1C	2C	3C	4C
	Slight (<10%)	D	1D	2D	3D	4D

 High Concern     
  Moderate Concern     
  Low Concern

#### Guidelines for the Definition of Clean and Establishing Environmental Values.

The guidelines for acceptable levels of clean contained in Table 1 are intended to inform decisions about cessation of cleaning operations. It should be noted that they *do not* constitute guidelines for identifying when environmental values and functions have been fully restored. Rather, the guidelines are intended to identify when ***the potential for on-going environmental harm has been minimised and the potential for rehabilitation of pre-spill ecological conditions has been maximised.*** The time frames for cleaning will be dependent on the cleaning methods chosen for each resource.

These guidelines are intended as a reference only, and specific cases may be dealt with differently as required by the parties involved in the shoreline clean-up, assessment and sign-off procedure. For the purpose of the sign-off, criteria regarding food organisms and water quality may require analytical assessment, depending on the use for the resource and the likelihood for contamination.

Table 1. Guidelines for Agreed Environmental Values and Acceptable Levels of Clean. Order in table does not imply order of priority.

<b>Resource/Environmental Value</b>	<b>Acceptable Level of Clean</b>
Contact Surfaces <sup>1</sup>	No visible tar balls, slicks or sheens that could adhere to organisms or interfere with normal animal/plant feeding, life cycle processes and behaviour. Compliance with ANZECC Water Quality Guidelines for Protection of Aquatic Ecosystems <sup>2</sup> to the required level of environmental protection.
Shoreline/intertidal sediments as habitat <sup>3</sup>	Need not be totally clean, but remaining residues must not inhibit potential for recovery through toxic or smothering effects. Compliance with ANZECC Water Quality Guidelines for Protection of Aquatic Ecosystems to the required level of environmental protection.
Subtidal substrata as habitat <sup>4</sup>	Remaining residues must not inhibit potential for recovery through toxic or smothering effects. Compliance with ANZECC Water Quality Guidelines for Protection of Aquatic Ecosystems to the required level of environmental protection.
Subsurface water as habitat	Oil contamination should not interfere with normal animal/plant feeding, movement, life history processes and behaviour. Must not be toxic to any life stages of key species or exceed recommended concentrations from ANZECC Water Quality Guidelines for Protection of Aquatic Ecosystems to the required level of environmental protection.
Shoreline (as an ecosystem interacting with other aquatic near-shore ecosystems)	Remaining residues must not be mobile such that they will leach out into near-shore waters.
Cultural and historic value <sup>5</sup>	Sensitive to and, where possible, addressing needs of cultural custodians.
Food organisms and water that may be used for human consumption	Must meet relevant statutory specification for residues and taints (e.g. NHMRC, NFA, ANZECC).
Amenity and/or safety of beaches and structures (e.g. jetties and slipways)	No visible oil. No oil that rubs off on people, boats or infrastructure, or causes a slip hazard. Compliance with ANZECC Water Quality Guidelines for Recreational Water Quality, if required. Compliance with OHS requirements.

<sup>1</sup> 'Surfaces' includes water surfaces, sediment surfaces and hard surfaces, and is intended to encompass hard/sediment surfaces that organisms move across, water surfaces that animals might broach to breath, feed or flee, and air/water interface for air-breathing organisms. In this last case, the definition of clean would include no air contamination.

<sup>2</sup> ANZECC (2000) *Australia and New Zealand Guidelines for Fresh and Marine Water Quality*. See particularly Volume 2 - Aquatic Ecosystems - Rationale and Background Information.

<sup>3</sup> Habitat is the place where organisms live. Habitat should be suitable for all organisms that naturally occur in the area.

<sup>4</sup> Under this Environmental Value, water is considered as a habitat for plankton, fish, corals, mammals, seagrasses, aquaculture species etc. Habitat includes suitable conditions to live in, as well as an appropriate environment to feed and to otherwise sustain viable populations (i.e. support life cycle processes).

<sup>5</sup> Cultural values may be diverse and particular to each location and resource. Responders should consult relevant managers and stakeholders and be aware that, in some circumstances, oiling may be preferable to disturbance of sites.

### Possible clean-up options

The following techniques comprise the range of activities likely to be undertaken to effect a clean-up:

1. scooping/scraping/skimming
  2. cold low pressure flushing plus skimming
  3. medium pressure (fire hose) flushing plus skimming
  4. cold high pressure flushing plus skimming
  5. hot high pressure flushing plus skimming
  6. wiping with rags
  7. raking/sediment turning
  8. shore cleaning agent
  9. removal / replacement, eg. sand
  10. wave action alone
- P. Stakeholders may be included in the discussions of priorities.

Table 2: Recommended clean-up techniques for shoreline type and degree of coating by oil:

<b>Shoreline Type</b>	<b>Level 1 Pool (&gt;1.0cm)</b>	<b>Level 2 Cover (0.1 – 1.0cm)</b>	<b>Level 3 Thin Coating (0.02 – 0.1cm)</b>	<b>Stain (&lt;0.01cm)</b>
Industry facility structures	1	P3,4	10	10
Manmade concrete and stone walls	Test methods 2 and 3	P2	P3	P4,8
Mud flats	Cleaning inappropriate			
Sandy beach	1	7	P9	10
Boulder shoreline	Test methods 2 and 3	P2	P3,6	10
Pebble shoreline	1	P2	P7	10
Rock platform	1	P2	P3,6	10

## **Section 2 – Template for Shoreline Sign-off Plan**

**Using this template: Retain headings and text. Insert details where prompted by *[italics in square brackets]*.**

This plan documents the consideration and process used to reach agreement that the foreshore clean-up operations have been completed to the satisfaction of responsible agencies and stakeholders. The plan provides for a comprehensive foreshore inspection to be undertaken by a sign-off team after notification that clean-up operations have ceased and/or that no further net environmental benefit is likely to be achieved by further clean-up operations.

### Background

*[Provide a summary of the incident and the actions taken so far]*

### Summary of Foreshore Contamination

*[Provide a summary of the extent and severity of contamination resulting from the incident.]*

### Sign-Off Procedure

Stage I - Foreshores were constantly monitored over the period by shoreline assessment teams (SCAT). The Incident Control Centre was informed via formal field reports twice daily of areas requiring work or areas considered ready for inspection and sign-off.

Stage II – Clean-up work required was programmed and assigned by Operations for the incident. The priority for allocation of resources and clean-up was endorsed by the Incident Controller.

Stage III - Following advice from Operations that the foreshore segment was considered clear of contamination, the Foreshore Inspection and Sign-Off Team inspected the foreshore segments and, if appropriate, signed off that segment of foreshore.

If the inspection revealed an unacceptable level of oiling in areas or new areas of oiling or reoiling were discovered, then these areas were subsequently monitored and, where appropriate, further clean-up activities initiated, prior to a further foreshore inspection for sign-off.

The Incident Controller will make the final determination of when the shoreline clean-up operation will cease. This was based on the advice of the Foreshore Inspection and Sign-Off Team.

### Foreshore Inspection and Sign-off Team

Throughout the response operation, close consultation occurred between the following stakeholders to determine the needs and priorities for cleaning of the foreshores.

*[insert stakeholders consulted here]:*

When it was assessed that degree of residual contamination of foreshores was consistent with the agreed Environmental Values for each shoreline segment established after consultation with interested parties (see Definitions of Clean, below), a formal process to end foreshore operations commenced.

A Foreshore Inspection and Sign-off Team was assembled. Composition of the team was as follows:

*[insert name of relevant agency/organisation/company representing each stakeholder in the table below]*

<b>Stakeholder</b>	<b>Agency/Organisation/Company</b>
Environment	
Combat Authority	
Polluter (e.g. ship owner)	
Land owner	
Cultural representative	
Other	



### **Section 3 – Rehabilitation Monitoring**

#### **Monitoring to Determine Whether Rehabilitation has Occurred**

The guidance in Part A of these guideline provides levels of cleaning that are assumed to be sufficient to provide the potential for return of normal ecosystem function, including rehabilitation of oil affected assemblages. The Incident Control Team should, in all cases, consider whether on-going monitoring is necessary to document the extent of recovery that has occurred and determine whether severely affected areas are rehabilitating naturally or require further involvement to assist rehabilitation.

Rehabilitation monitoring should be done in accordance with recognised research methods and in most cases will require a comparison to unimpacted reference areas.

ESCs will need to be aware of the necessity to consider how rehabilitation monitoring will be funded. The National Plan will only fund ‘Type I’ monitoring, that is, the collection of information about the spill and the effectiveness of cleanup for the purposes of aiding decision making *during shoreline clean-up*. Type II monitoring includes post spill monitoring and the assessment of environmental or economic damages. Funding for rehabilitation monitoring will therefore need to be sourced outside the National Plan. Depending on the scale of the spill and the proposed post-spill studies, funding options may be negotiated with government agencies, the ship’s insurer and the International Oil Pollution Compensation Fund (IOPC).

#### **The Oil Spill Monitoring Handbook**

The Oil Spill Monitoring Handbook and Background Paper [www link], jointly published by the Australian Maritime Safety Authority and Maritime New Zealand, should be consulted to understand the distinction between Type I and Type II monitoring. The Handbook also provides a number of detailed methods which are primarily focussed on Type I monitoring, but also may be used or adapted in Type II studies.

#### **The IOPC Fund Claims Manual**

The IOPC Fund Claims Manual should be consulted for further information on the circumstances under which the IOPC Fund may contribute to post-spill studies and encourages the early involvement of the Fund in planning any such studies. The Fund requires that studies are carried out with professionalism, scientific rigour, objectivity and balance and encourages the formation of a committee or other mechanism to co-ordinate any such studies. The scale of the studies should be in proportion to the extent of the contamination and the predictable effects.