

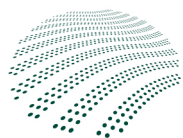


NATIONAL  
REMEDICATION  
FRAMEWORK

# Post-remediation Considerations

Guideline on the role of auditing

August 2019



**CRC CARE**

*A safer, cleaner  
environmental future*

## **Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, National Remediation Framework**

August 2019

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### **Note on the National Remediation Framework**

This document is one component of the National Remediation Framework (NRF). The NRF was developed by CRC CARE to enable a nationally consistent approach to the remediation and management of contaminated sites. The NRF is intended to be compatible with the National Environment Protection (Assessment of Site Contamination) Measure.

### **Acknowledgements**

CRC CARE acknowledges the contributions of the service providers and researchers who contributed to this document and the NRF as a whole, together with the NRF Steering Group.

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CRC for Contamination Assessment and Remediation of the Environment

National Remediation Framework

## **Guideline on the role of auditing**

Version 1.0: August 2019

# National Remediation Framework

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The following guideline is one component of the National Remediation Framework (NRF). The NRF was developed by the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) to enable a nationally consistent approach to the remediation and management of contaminated sites. The NRF is compatible with the *National Environment Protection (Assessment of Site Contamination) Measure* (ASC NEPM).

The NRF has been designed to assist the site contamination practitioner undertaking a remediation project, and assumes the reader has a basic understanding of site contamination assessment and remediation principles. The NRF provides the underlying context, philosophy and principles for the remediation and management of contaminated sites in Australia. Importantly it provides general guidance based on best practice, as well as links to further information to assist with remediation planning, implementation, review, and long-term management.

This guidance is intended to be utilised by stakeholders within the site contamination industry, including site owners, proponents of works, site contamination practitioners, local councils, regulators, and the community.

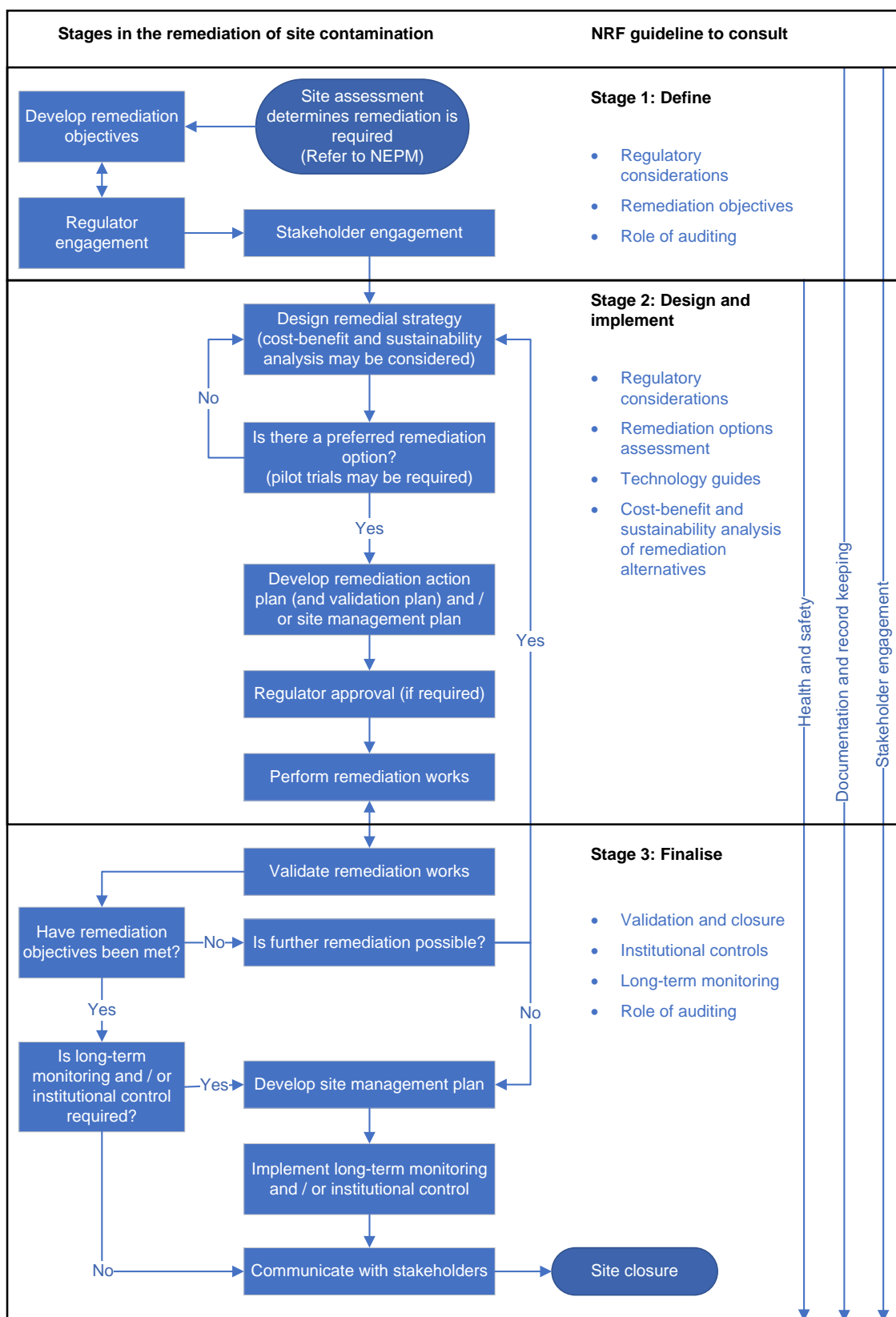
The NRF is intended to be consistent with local jurisdictional requirements, including state, territory and Commonwealth legislation and existing guidance. To this end, the NRF is not prescriptive. It is important that practitioners are familiar with local legislation and regulations and note that **the NRF does not supersede regulatory requirements**.

The NRF has three main components that represent the general stages of a remediation project, noting that the remediation steps may often require an iterative approach. The stages are:

- define
- design and implement, and
- finalise.

The flowchart overleaf provides an indication of how the various NRF guidelines fit within the stages outlined above, and also indicates that some guidelines are relevant throughout the remediation and management process.

It is assumed that the reader is familiar with the ASC NEPM and will consult other CRC CARE guidelines included within the NRF. This guideline is not intended to provide the sole or primary source of information.



## Executive summary

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The objective of this guideline is to provide a background on the role of auditing in the context of site contamination remediation in Australia, and to indicate the generic scope that an audit is likely to take. This guideline is not intended to replace state and territory based auditor legislation or guidance.

Within the context of the NRF, an audit is an independently review the assessment and/or remediation work carried out by environmental consultants and to provide independent expert opinion regarding any potential impacts to human health and/or the environment relating to site contamination, and the suitability of land for its intended use (ASC NEPM sch. 9).

The audit may also determine:

- the robustness of the preceding site investigation (to assess the nature and extent of site contamination)
- whether land is, or is not, suitable for the current or proposed land use, or
- whether additional investigation and/or remediation is necessary before the goal of the audit has been achieved.

In general, an audit is used when:

- it is triggered by relevant legislation
- a regulator requires one, or
- the proponent requests one.

The triggers for audits differ across jurisdictions, but include such things as:

- certain types of contamination
- contamination migrating off-site
- redevelopment or change to a more sensitive land use, or
- remedial works on certain types of land (such as airports).

An audit of remediation activities will generally comprise one or more of the following:

- review of pre-remediation documentation
- site visits during remediation works
- interim audit advice (some jurisdictions only)
- review of remediation and validation reports prepared by environmental consultants
- liaising with regulators
- reporting, and
- site closure, including long term monitoring or institutional controls (if required).

## Abbreviations

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ACT	Australian Capital Territory
ASC NEPM	<i>National Environment Protection (Assessment of Site contamination) Measure 1999 (amended 2013)</i>
CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation of the Environment
EPA	Environment(al) Protection Authority/Agency
NRF	National Remediation Framework
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
SA	South Australia
TAS	Tasmania
VIC	Victoria
WA	Western Australia

## Glossary

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Appoint	The appointing, accrediting or accepting of auditors under the jurisdiction's auditing scheme.
Audit	An independent review by an appointed auditor of the assessment and/or remediation work carried out by environmental consultants and to provide independent expert opinion regarding any potential impacts to human health and/or the environment relating to site contamination, and the suitability of land for its intended use.
Audit report or statement	The report produced by the auditor as a result of an audit.
Auditor	Individuals acting under statute is to carry out reviews of the assessment and/or remediation work carried out by environmental consultants and to provide independent expert opinion regarding any potential impacts to human health and/or the environment relating to site contamination, and the suitability of land for its intended use (ASC NEPM sch. 9)
Auditors assistant	A trained and experienced environmental practitioner who aids the auditor to complete an audit.
Beneficial use	<p>A particular value or use of the environment or any element or segment of the environment which:</p> <ul style="list-style-type: none"> <li>• is important for a healthy ecosystem</li> <li>• is conducive to public benefit, welfare, safety, health or aesthetic enjoyment which requires protection, or</li> </ul> <p>is declared in state or territory environment protection policy to be a beneficial use.</p>
Certified practitioners	An accredited professional active in the private sector of site contamination assessment and/or remediation. Two relevant schemes may be recognised in the land industry – CenvP and CPSS CSAM.
Concentration	The amount of material or agent dissolved or contained in unit quantity in a given medium or system.
Conceptual site model (CSM)	A representation of site-related information including the environmental setting, geological, hydrogeological and soil characteristics together with the nature and distribution of contaminants. Contamination sources, exposure pathways and potentially affected receptors are identified. Presentation is usually graphical or tabular with accompanying explanatory text.



Contaminant	Any chemical existing in the environment above background levels and representing, or potentially representing, an adverse risk to human health and/or environment, and/or any other environmental value.
Contaminated site	A generic term referring to any land (including soil, surface water, groundwater and soil vapour) that is affected by substances that occur at concentrations above background or local levels and which represent, or potentially represent, a risk to human health and/or the environment, and/or any other environmental value. It is not necessary for the boundaries of the site contamination to correspond to the legal ownership boundaries.
Contractor	A company that provides specialist services related to the physical implementation of a remediation action plan.
Environment(al) protection authority/agency	The government agency in each state or territory that has responsibility for the enforcement of various jurisdictional environmental legislation, including some regulation of contaminated land.
Environmental value	Refer to Beneficial use
Practitioner	Those in the private sector professionally engaged in the assessment, remediation or management of site contamination.
Proponent	A person who is legally authorised to make decisions about a site. The proponent may be a site owner or occupier or their representative.
Remediation	Remediation is taking steps towards remedying something, in particular of reversing or stopping environmental damage. It may be action designed to deliberately break the source-pathway-receptor linkage in order to reduce the risk to human health and/or the environment to an acceptable level.
Risk	The probability that in a certain timeframe an adverse outcome will occur in a person, a group of people, plants, animals and/or the ecology of a specified area that is exposed to a particular dose or concentration of a specified substance, i.e. it depends on both the level of toxicity of the substance and the level of exposure. Risk differs from hazard primarily because risk considers probability.
Site	A parcel of land (including ground and surface water) being assessed for contamination, as identified on a map by parameters including Lot and Plan number(s) and street address. It is not necessary for the site boundary to correspond to the Lot and Plan boundary,

	however it commonly does.
Specialist team	Individuals that assist the auditor in areas outside their area of expertise. Referred to as a support team or expert support team in some jurisdictions.
Technical advisor	An auditor operating on Defence land.
Voluntary audit	Audits which are not a legal requirement but are carried out in order for due diligence or other purposes. Referred to as non-statutory audits in some jurisdictions.

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# 1. Introduction

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The objective of this guideline is to provide a background on the role of auditing in the context of site contamination remediation in Australia, and to indicate the generic scope that an audit is likely to take. This guideline is not intended to replace state and territory based auditor legislation or guidance.

This guidance is intended to be utilised by stakeholders within the site contamination industry, including site owners, proponents of works, contaminated land professionals, local councils, other regulators and the community.

It is assumed that the reader is familiar with the ASC NEPM and will consult other relevant guidelines including those within the NRF. This guideline is not intended to provide the sole or primary source of information about auditing or remediation.

It should be noted that each state or territory has legislation and guidance related to site contamination audits. **This guidance does not supersede those state based regulatory requirements**, and familiarity with local legislation and regulations is necessary before proceeding with environmental remediation and management. It is also noted that the information in this guideline was current at the time of publication.

The NRF defines an audit as:

*An independent review of the assessment and/or remediation work carried out by environmental consultants and to provide independent expert opinion regarding any potential impacts to human health and/or the environment relating to site contamination, and the suitability of land for its intended use.*

The audit may also determine:

- the robustness of the preceding site investigation (to assess the nature and extent of site contamination)
- whether land is, or is not, suitable for the current or proposed land use, or
- whether additional investigation and/or remediation is necessary before the goal of the audit has been achieved.

At times, environmental practitioners may use alternative approaches, guidelines and standards during the remediation and/or monitoring of site contamination and auditors are expected to evaluate the suitability and appropriateness of their use by exercising their professional judgement.

## 2. When to use an audit

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In general, an audit is used when:

- it is triggered by relevant legislation
- a regulator requires one, or
- the proponent requests one.

The triggers for audits differ across jurisdictions, but in general include such things as certain types of contamination, contamination migrating offsite, redevelopment or change to a more sensitive land use, or any remedial works on certain types of land (such as airports).

Regulators can require audits as part of management controls and orders. For more information on the specific nature of regulatory requirements see the NRF [Guideline on implementing institutional controls](#).

Proponents may request audits of environmental investigations or remediation if they desire an independent review of the practitioner's work. However, proponents should be aware that there is no difference in rigour between an audit they have requested, and an audit that is triggered or required. Thought should be given to timelines and budgets before requesting an audit to make sure the audit best serves the objectives of the project. For example, there are occasions where the outcome of the audit may determine or help determine the proposed future use of the site, such as when an audit supports a decision to allow a more sensitive land use than exists or is currently allowed by planning.

Early communication between the environmental practitioner, auditor and proponent improves the efficiency of the audit by ensuring that all environmental issues are addressed to the satisfaction of the auditor from an early stage (eg assessment and remedial planning), saving both time and money.

### 3. Auditing schemes

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As each jurisdiction has its own legislation and guidelines regarding audits, the names and functions of audits vary between jurisdictions based on what has triggered the audit. In general, there are two types of audits available; those required by the law (mandatory) and those entered voluntarily (voluntary). Typically, the scope and rigour of an audit will be the same regardless of what has triggered the audit or whether it is required or voluntary.

Commonwealth owned land such as airports and Department of Defence sites may be subject to audits that fall outside the formal state and territory-based auditing schemes.

Formal auditing schemes have been established in five Australian jurisdictions:

- New South Wales (NSW)
- Queensland (QLD)
- South Australia (SA)
- Victoria (VIC), and
- Western Australia (WA)

The Australian Capital Territory (ACT) Environmental Protection Agency (EPA) formally uses the schemes from several other jurisdictions. At the time of writing the Northern Territory (NT) and Tasmania (TAS) did not have independent auditor schemes however, they generally approve of the use of auditors appointed in NSW or VIC.

Due to the potential for revision of requirements and guidance over time information pertaining to auditing schemes and requirements in each jurisdiction should be sought through the relevant environmental regulator websites, the links to which are provided in table 1.

To appoint auditors under the auditing schemes, the regulatory agencies are responsible for:

- establishing selection criteria and processes for appointing competent individuals as auditors
- developing regulations relating to auditors
- developing guidelines on the site contamination audit system for auditors, and
- developing guidelines for auditors, site contamination practitioners, local government and the community on the investigation and remediation of site contamination.

Whilst requirements vary across Australian jurisdictions the key requirements are generally consistent. In all jurisdictions, only individuals can be appointed as auditors, a body corporate cannot.

Table 1: Jurisdictional environmental regulator office and contact details

Jurisdiction and authority	Instrument	Relevant environment agency website
ACT EPA	<i>Environment Protection Act 1997</i> <i>ACT EPA (2009) Contaminated Sites</i> <i>Environment Protection Policy</i>	<a href="http://www.accesscanberra.act.gov.au/app/answers/detail/a_id/1564">www.accesscanberra.act.gov.au/app/answers/detail/a_id/1564</a>
Airports	<i>Airports Act 1996</i> <i>Airports (Environment Protection) Regulations 1997</i>	<a href="http://infrastructure.gov.au/aviation/airport/index.aspx">infrastructure.gov.au/aviation/airport/index.aspx</a>
EPA VIC	<i>Environment Protection Act 1970</i> (Major review of the environmental regulatory framework is underway view)	<a href="http://www.epa.vic.gov.au/our-work/environmental-auditing">www.epa.vic.gov.au/our-work/environmental-auditing</a>
NSW EPA	<i>Contaminated Land Management Act 1997</i>	<a href="http://www.epa.nsw.gov.au/clm/auditor_scheme.htm">www.epa.nsw.gov.au/clm/auditor_scheme.htm</a>
NT EPA	<i>Waste Management and Pollution Control Act</i>	<a href="http://ntepa.nt.gov.au/waste-pollution/compliance/environmental-audits">ntepa.nt.gov.au/waste-pollution/compliance/environmental-audits</a>
QLD DES	<i>Environmental Protection Act 1994</i>	<a href="http://www.qld.gov.au/environment/pollution/management/contaminated-land/auditors/">www.qld.gov.au/environment/pollution/management/contaminated-land/auditors/</a>
SA EPA	<i>Environment Protection Act 1993</i>	<a href="http://www.epa.sa.gov.au/environmental_info/site_contamination/auditor_accreditation">www.epa.sa.gov.au/environmental_info/site_contamination/auditor_accreditation</a>
TAS EPA	<i>Environmental Management and Pollution Control Act 1994</i>	<a href="http://epa.tas.gov.au/regulation/contaminated-sites/identification-and-assessment-of-contaminated-land/engaging-a-contaminated-site-assessment-consultant">epa.tas.gov.au/regulation/contaminated-sites/identification-and-assessment-of-contaminated-land/engaging-a-contaminated-site-assessment-consultant</a>
WA DWER	<i>Contaminated Sites Act 2003</i>	<a href="https://www.der.wa.gov.au/our-environment/contaminated-sites/53-contaminated-sites-auditors">https://www.der.wa.gov.au/our-environment/contaminated-sites/53-contaminated-sites-auditors</a>

Note: websites current as at June 2019.

Auditing guidance in NSW, QLD, SA, VIC and WA (i.e. all jurisdictions with an auditing scheme) refers to the Commonwealth *Mutual Recognition Act 1992*. Mutual recognition means that an individual registered in connection with an occupation within one Australian jurisdiction should have the ability to carry out an equivalent occupation within another jurisdiction. Therefore, an individual registered as an auditor in one state or territory should be entitled to be registered as an auditor in a second state or territory

after notifying the regulator of their appointment, completing relevant documentation and demonstrating their knowledge of relevant policies and legislation in the second jurisdiction. This is subject to certain provisions, such as not being involved in disciplinary proceedings in relation to auditing work. Auditors must continue to follow the regulations and guidelines where they hold their primary appointment and carry insurance for the additional state or territory.

In ACT, NT and TAS, auditors appointed in other jurisdictions may be considered by the regulator on an individual basis as per the requirements of their respective legislative instruments. Similarly, Commonwealth audits rely on auditors appointed under the above formal state and territory-based schemes.



## 4. Audit stakeholders

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There are several stakeholders in the auditing process including auditors, audit support team, regulators, the proponent, planners, environmental practitioners and the general community.

### 4.1 Auditors

Auditors will have experience in the core competencies required by their auditing scheme, which generally encompass the following areas (ASC NEPM, Sch B9):

- site contamination assessment and management
- remediation design and management
- assessment of contaminant exposure pathways
- evaluation and interpretation of chemical and analytical data
- soil, soil gas and groundwater sampling design and methodology
- identification of potential human health and environmental risks
- quality control/quality assurance procedures, and
- risk communication.

In addition, auditors will:

- have knowledge and understanding of legislation, regulations and policies relevant to their jurisdiction
- be familiar with guidelines relevant to site contamination assessment, remediation and validation, and
- have up-to-date knowledge of relevant scientific and technical developments and regulatory literature relating to new legislation and court proceedings and decisions relating to site contamination.

Auditors are individuals who are usually employed by an environmental consultancy. As such they may conduct work other than audits such as environmental investigations or remediation, but they or their company must not hold an interest in a site they are auditing.

In their role as independent reviewers, auditors owe a primary duty of care to the environment and the health and safety of the community. The audit must be carried out in accordance with the practice standard expected of an auditor and auditors should exercise due care, diligence and professional judgement, to give the community confidence in the results of an audit.

**Jurisdictional requirements can differ, and should be referred to.**

When carrying out an audit, auditors are expected to:

- maintain a high professional standard
- exercise their professional judgment, applying their knowledge and skill appropriately

- uphold the independence and integrity of the audit system
- comply with relevant jurisdictional legislation and guidelines
- comply with any specific conditions of accreditation, if applicable and
- act with due care and diligence.

The value of the auditing process depends on the professional conduct and integrity of the auditors, and auditors must demonstrate that they have exercised their own professional judgment and that the opinions they express in the audit report have been reached independently. The auditor must undertake an independent evaluation, and therefore not be in a position where they or their employer may benefit from the outcome of the audit. The auditor must not conceal any relevant information from the regulatory bodies nor provide or issue false or misleading information including conclusions.

To avoid actual or potential conflicts of interest it is generally accepted that the auditor (refer to jurisdictions):

- Cannot carry out an audit of sites where they are related to the owner or occupier of the site.
- Cannot carry out an audit of sites where they have an interest (financial, proprietary or other) in the site or activities carried out on the site.
- Cannot audit work carried out by themselves, their company or a relative (as defined in regulations and/or guidance), except for in VIC in some circumstances. This means the auditor cannot have been directly involved in the design or implementation of contamination assessment or remedial works at the site or be associated with the company that carried out this work.
- Should not be engaged by the practitioner whose work is to be reviewed.
- Should not use their title to provide opinions on the suitability of a site for a proposed or intended use unless they are carrying out an audit of that site. Reports or correspondence produced when working as an environmental practitioner should not be signed off as an appointed auditor on behalf of the consultancy.
- Will abide by the conditions of their professional indemnity insurance.

## 4.2 Audit support team

An audit usually comprises a large body of work which is inefficient and unachievable for one person to complete alone. Thus, an auditor is likely to have a team whom they directly supervise to assist them in carrying out the audit, consisting of individuals employed at the same company as the auditor, or individuals otherwise employed.

Auditors will generally have an auditor's assistant, who is themselves a trained and experienced environmental practitioner, who carries out the day-to-day activities of the audit, may conduct interim site visits, or prepare reports for the auditor's review.

Due to the multidisciplinary nature of site assessment and remediation, it is unlikely that an auditor will personally hold all the technical competencies relevant to every aspect of site contamination they may encounter during their audit career. Auditing schemes therefore require an auditor to be able to identify when an issue is beyond their

expertise, and to obtain the appropriate specialist advice where required. Sometimes the individual specialists must be approved by the regulator before utilising their expertise.

Whilst an auditor may rely heavily on their team, they are expected to retain an ongoing and direct involvement in the process and remain personally responsible for the audit.

### 4.3 Regulators

Environmental protection is generally managed by Commonwealth, state and territory-based environment agencies..

The regulator is responsible for administering the legislation pertaining to site contamination and who dictate the remediation requirements in their jurisdiction. The regulator can also guide the environmental practitioners and auditor on the environmental values to be protected at a site and provides guidance on the interpretation of legislation and regulatory requirements as they relate to remediation in their jurisdiction. Under certain circumstances the regulators have an obligation and authority to direct auditors where policy matters are an issue.

In jurisdictions with a formal auditing scheme, the regulator administers the auditing scheme and is therefore responsible for appointing or accrediting auditors. The regulator may, under certain conditions, require an auditor to be engaged during the assessment and remediation works at a site, and further information on those circumstances is available in the NRF [Guideline on implementing institutional controls](#).

### 4.4 Proponent

In general, the services of an auditor may be engaged by anyone with a recognised interest in the land being audited, such as the site owner, site occupier or a regulator. The person who has engaged the auditor is considered in this guideline to be the proponent. The engagement of an auditor will always be at the expense of the person who commissioned the auditor, irrespective of whether the work was voluntary or required. A list of auditors is typically provided by the relevant authority in each jurisdiction whose websites are provided in **section 3**.

### 4.5 Environmental consultants

In most cases, a site owner or developer initially engages an environmental consultant to assess a site for contamination. If contamination is identified and it is considered to pose an unacceptable risk to human health or the environment, remediation and/or management is usually recommended. Environmental consultants then develop a remediation plan to achieve the objectives specified by the owner or developer, implement the plan (often using a remediation contractor), and then validate the remedial works. Environmental consultants also responsible for developing plans and conducting post remediation monitoring if required.

Active communication between the environmental consultant, auditor and the proponent prior to initiating remedial works is beneficial in clarifying the requirements and process for the audit, the communication being driven by the practitioner. Communication

should be maintained during the process of the remedial works and validation to inform all parties of progress and potential variations from the RAP.

## 4.6 Contractor

Remedial works themselves are usually carried out by a contractor separate from the practitioner. These are specialist companies that provide services such as:

- earthworks
- specialist groundwater remediation such as thermal or pump-and-treat
- vapour or indoor air monitoring
- occupational hygienist (typically for particulate monitoring during earthworks)
- heritage or wildlife experts
- arborist
- asbestos removal, and
- installation of vapour barriers, geotextiles, permeable reactive barriers (PRBs)

The contractor(s) may be engaged by the practitioner on behalf of the proponent or directly by the proponent.

## 4.7 Planning authorities

Planning authorities may be the primary users of the audit reports.

## 4.8 Other stakeholders

There are often other stakeholders involved in remediation of site contamination, such as the public, the local community or interest groups. It is unusual for these stakeholders to take an active role in the audit or audit process, even when they are involved in other aspects of the remediation (such as options assessment). An auditor may request community consultation as part of remediation works.

For further information on identifying and engaging stakeholders, readers are directed to the NRF [Guideline on stakeholder engagement](#) for more information.

## 5. Components of an audit

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An audit process will generally comprise one or more of the following:

- review of pre-remediation documentation
- site visits during remediation works
- interim audit advice (accepted in some jurisdictions only)
- liaising with regulators
- reporting, and
- site closure, including long term monitoring.

Further information on each of these components is provided below.

### 5.1 Review of pre-remediation documentation

The environmental practitioner would typically prepare several documents prior to remediation. The range and title of these documents will vary depending on the jurisdiction and the complexity of the site, and sometimes the information will be split between multiple specific reports or combined into one. Readers are directed to the NRF [Guideline on documentation, record keeping and reporting](#) for more detailed information on recommended documentation content.

When reviewing the pre-remediation documentation, the auditor will evaluate whether it is theoretically appropriate and justified by the findings of any site investigations. The auditor will also assess the quality and completeness of the available information and seek further information as necessary. This encompasses a review of the following elements:

- Extent to which the conceptual site model is understood and reported
  - completeness and robustness of the investigation of the site
  - assessment including source-pathway-receptor linkages, and
  - assessment of level of risk and drivers for remediation. (e.g. has the practitioner adequately covered the contamination issues and associated risks and adequately identified what needs to be remediated).
- Risk assessments:
  - completeness and robustness of the understanding of source-pathway-receptor linkages, and
  - site specific risk assessments for human health or the environment.
- Remediation objectives.
- Remediation feasibility or options assessment:
  - considers the remediation hierarchy
  - evaluates relevant remedial approaches, and
  - documents the decision-making process undertaken in selecting the most appropriate remedial approach for the site.

- Remediation action plan:
  - assesses the theoretical suitability of a proposed remediation plan to address the identified unacceptable risks
  - assesses whether the proposed remediation is in accordance with the applicable jurisdiction's legislation regarding remediation
  - environmental modelling to predict possible outcomes of remedial actions or to consider no further action (if included)
  - contingency plans if the selected remedial method does not meet validation criteria
  - site or environmental management plan during remediation operations, and
  - validation scope and program.
- Ongoing or long-term monitoring plans.
- Community engagement plans.

## 5.2 Suring remediation works

During the remediation works the auditor (or their team) will likely visit the site to observe and verify, to the extent practicable, the progress and completion of the remedial work. This may include observing such things as:

- the location of excavations
- the movement of materials
- the installation of a capping layer
- the functionality of an active remedial system, or
- specific field methods such as validation sampling or compaction testing.

In some jurisdictions the auditor may collect independent verification samples, if considered necessary to form an opinion regarding the condition of the site. Verification samples should be comparable to assessment samples (i.e. taken in the same location from similar material, in a similar timeframe). The need for independent sampling is greater when the auditor has not been involved in the project from an early stage.

## 5.3 Interim audit advice

During the audit process, the auditor may be called on to give their formal opinion on a proposal, to give the team confidence to move forward in circumstances when a full report is unwarranted. In response to written request for formal advice, the auditor may choose to issue an interim audit advice to formalise their response - this is not consistent practice across jurisdictions.

If used/accepted, interim audit advice may be appropriate when:

- the auditor concludes that a certain portion of the investigation work is incomplete
- advice is required on the need to resolve data gaps prior to commencing remediation

- variations to the remedial plan are required during the remediation works in response to changing site conditions or unforeseen circumstances, or
- validation demonstrates that remediation is incomplete.

In WA, the relevant reporting to the regulator is in the form of an audit report, rather than an interim audit advice (DER 2016).

## 5.4 Liaising with stakeholders

During an audit, the auditor may be required by the relevant legislation to do things such as:

- Provide notice to the appropriate regulatory bodies of the audit within the timeframe stipulated by legislation.
- Provide information such as guidelines and fact sheets to the site owner/occupier to help them understand the audit process.
- Verify the circumstances that triggered the need for an audit to be undertaken.
- Bring identified imminent environmental or public health risks to the attention of the regulator as soon as possible or as set out in the jurisdictional guidance.
- Check that relevant legal requirements applicable to the site assessment, remediation and validation work have been complied with or justify any departures from those requirements.

## 5.5 Reporting

Upon completion of remedial works the practitioner will prepare a report that details the remediation and validation. This is typically called a validation report and the reader is directed to both the *NRF* [Guideline on validation and closure](#), and the *NRF* [Guideline on documentation, record keeping and reporting](#) for more detailed information on the specific content to include in reports. The auditor then reviews this report in accordance with jurisdictional audit requirements, and may:

- Confirm the methodology implemented for the physical works was adequate and consistent with the remediation action plan.
- Confirm the validation and monitoring program was adequate and consistent with the remediation action plan.
- Assess the quality of the validation and monitoring data presented as verifying the success of the program.

Based on the review of the validation report the auditor will prepare a deliverable eg a report or a statement. The name and specific contents of this deliverable is determined by each jurisdiction; however, it is referred to within the NRF as an audit report for simplicity. Some jurisdictions, like WA, may require reports at earlier stages as well.

The audit report will likely be a self-contained document, preferably not requiring the reader to reference other material or documents to support the conclusions of the audit. The site audit report will clearly set out the rationale for the auditor's findings, therefore allowing the reader to understand the auditor's decision making. This may include the

site history, field observations, field measurements, bore logs, site plans, details of the remedial and validation works, analytical results, and a review of the practitioner's quality assurance and quality control procedures. The audit report should also include the scope and findings of any previous audits carried out on the site.

The audit report will discuss the issues pertinent to the actual or potential contamination of the site and an evaluation of whether the remedial objectives have been met. Where residual contamination remains, the audit will review the practitioner's suggestions for ongoing management of the site, including long term monitoring or institutional controls, particularly in relation to the future land use of the site and the potential for the residual contamination to be disturbed or encountered later.

The audit documentation will include a certification or declaration that the auditor has personally completed the audit and that they have examined and are familiar with the information referred to in the statement or report. This may be within the audit report or a separate document. It is noted that in addition to being relied on by the person who engaged the auditor, the audit report may also be relied on by law by the regulator and planning authorities. It is not appropriate for the auditor to qualify the report to limit reliance to the auditor's client only.

## 5.6 Site closure and/or ongoing management

Site closure is the process of obtaining approval by the regulator and/or auditor, if required, to cease remediation. The conditions required to achieve site closure are highly site-specific.

There are generally two ways in which to achieve site closure:

- The regulatory agency and/or auditor agrees that the site does not pose an unacceptable risk to human health and the environment and/or regulatory compliance has been met, and therefore site closure can be achieved in an absolute sense.
- The remediation objectives have been met, however there is some ongoing or residual impact that requires attention and the site is placed in a long-term management program.

Typically, validation criteria must be met for the regulator to discharge any regulatory notices or conditions placed on a site. It is noted that some sites may require consideration by more than one regulatory agency, e.g. a large plume affecting potable quality groundwater may be of interest to both environmental protection and water resource regulators.

If unacceptable risks from contamination remain (e.g. remediation objectives have not been achieved following several attempts at remediation, or waste or hazardous constituents remain onsite following remediation works), the regulator and/or auditor are likely to require long-term management of the site. If these residual impacts are considered to pose an unacceptable risk to human health or the environment, site closure is unlikely to gain regulatory and/or auditor approval.

The auditor will be involved with the decision to grant site closure, and may also be involved into the future, such as through periodic review of monitoring/management in



the future, such as when remediation can cease, or transition to another phase (active to passive for instance).

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