CL:AIRE

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SuRF-UK bulletin

SuRF-UK bulletins provide additional guidance for implementing sustainable remediation.

How sustainable remediation concepts align with ISO 14001:2015 environmental management systems

1. CONTEXT

Establishing an environmental management system (EMS) that is compliant with ISO 14001:2015 (International Organization for Standardization, 2015) is good business practice. This is particularly the case for those working in the sector of soil and groundwater remediation since there is a clear synergy between their activities and satisfying the requirements of ISO 14001:2015. Sustainable remediation represents remediation actions and goals that are informed by an understanding of the overall social, environmental and economic implications of remediation activities. Demonstrating the practice of sustainable remediation in line with the UK's Sustainable Remediation Forum (SuRF-UK) guidance (CL:AIRE 2010, 2020a, 2020b, 2021) on sustainable remediation will help organisations to demonstrate compliance with ISO 14001:2015. This in turn is aligned with many of the United Nations Sustainable Development Goals[1].

2. SCOPE

This bulletin seeks to identify and cross-reference the synergies between EMSs created under ISO 14001:2015 and the practice of 'sustainable remediation' outlined in SuRF-UK guidance. Identification of these commonalities will allow environmental consultancies, remediation practitioners and responsible land-owning organisations alike to track, improve and/or demonstrate enhanced environmental performance and their commitment to sustainability and sustainable development. Furthermore, as the revised 2015 ISO standard places a greater emphasis on 'embedding sustainability', an organisation heavily focused on land contamination management can improve the likelihood of accreditation against ISO 14001:2015 through consideration of sustainable remediation practices in their EMS. Whilst it is recognised that ISO 18504:2017 (ISO, 2017) provides procedures on sustainable remediation, comparisons with this standard are beyond the scope of this bulletin.

3. KEY CONCEPTS OF THE SuRF-UK FRAMEWORK

The SuRF-UK Framework (CL:AIRE, 2010) can be used for assessing the sustainability of soil and groundwater remediation, and for incorporating sustainable development criteria in land contamination management strategies. It helps assessors to identify the optimum land and/or groundwater remediation strategy and/or technique.

Sustainable remediation is defined by SuRF-UK as 'the practice of demonstrating, in terms of environmental, economic and social indicators, that the benefit of undertaking remediation is greater than its impact and that the optimum remediation solution is selected through the use of a balanced decision-making process'.

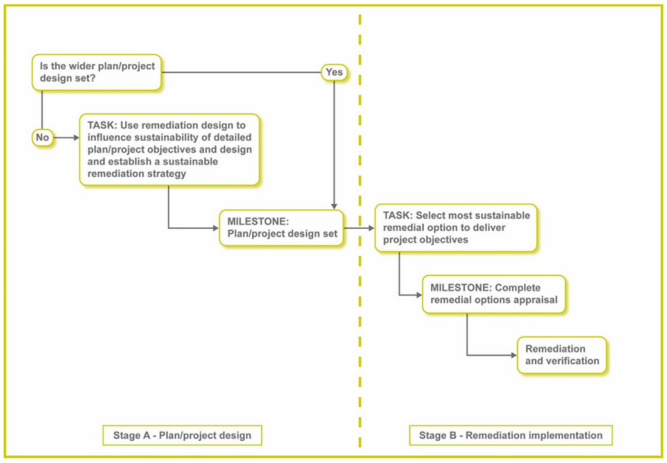

Figure 1. The SuRF-UK Framework (CL:AIRE, 2010).

The SuRF-UK Framework recognises two stages (Stage A and B – Figure 1) in the process of managing a site-based project where sustainable remediation decision-making can be applied:

A. The project/plan design stage (Stage A, e.g. at master planning stage) when some of the greatest sustainability gains of the remediation solution can be embedded into a wider project design, if remediation is considered at this early stage, or

B. Later in the process when wider project design aspects are already set, and the remediation options appraisal and the decision about the optimum remedial strategy or technique must fit with the wider project design (Stage B, e.g. during remediation options appraisal).

Examples of Stage A and Stage B scenarios are presented in the SuRF-UK Framework for assessing the sustainability of soil and groundwater remediation.

SuRF-UK also identifies a number of key principles that are associated with sustainable remediation, as follows:

- Principle 1: Protection of human health and the wider environment.
- Principle 2: Safe working practices.
- Principle 3: Consistent, clear and reproducible evidence-based decision-making.
- Principle 4: Record keeping and transparent reporting.
- Principle 5: Good governance and stakeholder involvement.
- Principle 6: Sound science.

[1] https://www.un.org/sustainabledevelopment/sustainable-development-goals/

4. ALIGNMENT OF ISO 14001:2015 AND THE SuRF-UK FRAMEWORK

Table 1 describes how the SuRF-UK Framework aligns with the key sections of ISO 14001:2015.

Table 1. Alignment of ISO 14001:2015 and the SuRF-UK Framework.

Section of ISO 14001:2015 and summary of key points	Alignment to the SuRF-UK Framework
Introduction ISO 14001:2015 explains the value of an EMS in contributing to the environmental pillar of sustainability. The first aim of an EMS is to contribute to sustainable development by *"protecting the environment by preventing or mitigating adverse environmental impacts*". Another aim of an EMS is to assist an "*organisation in the fulfilment of compliance obligations*" ISO 14001:2015 sets out the Plan–Do–Check–Act (PDCA) model, as part of a management system framework. The PDCA model is an iterative process which supports continued improvement in achieving sustainable development.	**Key alignment (1): SuRF-UK recognises the benefits of remediation in the context of sustainable development** There is clear alignment between the overarching aspirations of ISO 14001:2015 and the key objective of the SuRF-UK approach. The SuRF-UK Framework explains the concept of sustainable remediation as related to sustainable development. Sustainable remediation relates to all three pillars of sustainable development: economic, environmental and social factors. **Key alignment (2): Protection of the environment** Protection of human health and the wider environment is Principle 1 of the SuRF-UK principles of sustainable remediation. **Key alignment (3): Record keeping and transparent reporting** In support of sustainable remediation, it is essential to maintain clear and easily understood records and share information with interested parties. Principle 4 of the SuRF-UK Framework requires organisations to demonstrate compliance to legal and regulatory requirements throughout the life cycle of a remediation project. **Key alignment (4): Planning enables more sustainable development to be achieved** The PDCA model is at the core of the management system framework and summarises the requirements of ISO 14001:2015 at an overarching level. The PDCA 'plan' step aligns with the initial step in the SuRF-UK Framework. Planning is essential to ensure sustainability is considered throughout the life cycle of a project both at the strategic level and the technology level. Experience has shown that the benefits of sustainability are not fully realised if only considered at the 'do' step.
Section 1 **Scope of the Standard** The standard specifies the requirements of an EMS which can be used to improve an organisation's environmental performance, fulfil compliance obligations and achieve environmental objectives. The standard is applicable to any organisation and applies to their environmental activities. The standard does not specify environmental performance criteria. The standard can be used in whole or part. Conformity to the standard can only be achieved if all the requirements of the standard are incorporated into an organisation's EMS.	**Key alignment (5): Improving environmental performance** The SuRF-UK document sets out a framework for managing soil and groundwater contamination in a manner compatible with sustainable development principles. It provides a decision-making process and criteria for selecting the optimum land-use design and/or identifying remedial objectives and/or selecting a remedial strategy or technique. Use of the framework and criteria will improve an organisation's environmental performance, fulfil compliance obligations and achieve environmental objectives. The framework is applicable to any soil and groundwater remediation programmes or projects. The framework has been designed to integrate and complement UK legal and regulatory requirements. However, the inherent flexibility of the framework means it can be applied to remediation decision-making within regulatory systems outside the UK. Sustainable remediation is essentially a process approach or a way of working. It is not a standard-based delivery objective. Hypothetically, two different organisations can follow the SuRF-UK Framework on a similarly contaminated site but deliver solutions in different ways, depending on the legal jurisdiction and wider goals for the project. Similarly, the ISO 14001:2015 standard recognises different approaches to environmental compliance, commitments, objectives and technology use. ISO 14001:2015 supports use of a life cycle assessment (LCA) perspective that can prevent environmental impacts from being unintentionally transferred to other points in the life cycle. An organisation's EMS should consider its products and services, which is one of the ways sustainable remediation can be assessed. LCA is one of tools recognised by SuRF-UK.

Table 1. Alignment of ISO 14001:2015 and the SuRF-UK Framework (continued).

Section 2 **Normative References**	Not applicable.
Section 3 **Terms and Definitions** Several pages of terms and definitions including: environmental aspect, environmental impact, life cycle, and indicator. Indicator defined as "measurable representation of the condition or status of operations, management or conditions".	The definition of 'environmental impact' in ISO 14001:2015 terms is a change to the environment, whether adverse or beneficial. Hence, the environmental impacts of an organisation's activities can be both positive and negative. Sustainable remediation goals are about identifying and delivering the maximum net-benefit. To achieve this, both negative and positive impacts on all three pillars of sustainability need to be evaluated. Evaluation against relevant indicators that reflect all three pillars of sustainability is a key part in the assessment of sustainable remediation with the SuRF-UK Framework. The use of indicators ensures that impacts (both beneficial and adverse) are considered during the assessment of sustainability for each remedial option in the SuRF-UK Framework.
Section 4 **Context of the Organisation** Explains the need to understand the organisation, the needs and expectations of interested parties and the scope of the EMS. Sets out that to achieve intended outcomes, an organisation shall establish, implement and maintain an EMS.	**Key alignment (6): The value of understanding the organisation and its context** Understanding the context of an organisation and/or remediation project enables an understanding of the ability to achieve the intended outcomes. The SuRF-UK Framework provides guidance on many aspects that form the context for a remediation project. For example, legislative[2] and regulatory context and remediation (land use) scenarios. Understanding the context provides an opportunity to recognise the limitations and consider an organisation's commitment to sustainable remediation. For example, • Client objectives that may limit the application of sustainable remediation by a practitioner, or place limiting conditions within which sustainable remediation options are evaluated. • Local legal compliance obligations that shape ways of working for both a client and a practitioner. This will affect both the context for an organisation, and how it plans to manage them. ISO 14001:2015 is recognised as not intending to increase or change an organisation's legal compliance requirements. In certain jurisdictions, the acceptable risk goals within the regulatory framework are set very low and so, consequently, remediation goals are very stringent. In this setting the ability to remediate sustainably can only be achieved against this minimal risk goal. Thus, the sustainable remediation assessment is done within the boundaries that apply to the project. **Key alignment (7): Understanding the needs and expectations of interested parties** An essential part of the SuRF-UK Framework, and Principle 5 of the framework, is understanding and involving stakeholders. This is necessary to ensure compliance with legal and regulatory requirements which aligns with an intended outcome of an EMS. Both ISO 14001:2015 and SuRF-UK promote that all relevant stakeholders to an organisation's activities, remediation in the case of SuRF-UK, should be identified and engaged to support the intended outcomes of the EMS or remediation project.
Section 5 **Leadership** Describes requirements for commitment and leadership in an organisation, assignment of roles and responsibilities and the scope of the Environmental Policy relative to an EMS.	**Key alignment (8): Good governance** ISO 14001:2015 outlines the expectations for leadership within a certified organisation to ensure accountability, resources and continual improvement to achieve the intended outcomes of the EMS. Whether directly referenced or not within the EMS, these expectations also extend to sustainable remediation. SuRF-UK recognises good governance in Principle 5 of the framework. **Key alignment (9): Environmental Policy** Establishing and maintaining an environmental policy under ISO 14001:2015 provides a strategic high-level opportunity to commit to sustainable development, including to sustainable remediation, particularly if supporting or delivering remediation is a core business activity (e.g. environmental consultancy and remediation practitioners). The environmental policy should be reflected in site-specific approaches when implementing both Stage A and B of the remediation project. For example, the commitment to use local suppliers and materials or to improve the water quality of an aquifer.

[2] Environmental Protection Act 1990: http://www.legislation.gov.uk/ukpga/1990/43/contents

Table 1. Alignment of ISO 14001:2015 and the SuRF-UK Framework (continued).

Section 6 **Planning** Describes requirements for an organisation to understand its environmental aspects and compliance obligations; to understand related risks and opportunities, and to set objectives to manage them.	**Key alignment (10): Environmental aspects and objectives** The focus of the planning section within ISO 14001:2015 is the identification of the environmental aspects and objectives associated with the organisation's activities. This aligns with the objective of the SuRF-UK Framework for assessing the sustainability, including environmental impact, of soil and groundwater remediation. **Key alignment (11): Understanding risks and opportunities** ISO 14001:2015 requires the identification of adverse environmental impacts (threats) and beneficial environmental impacts (opportunities) of the organisation's activities. Within the context of a remediation project the remedial options are assessed and selected based on factors that measure the detriments and benefits of an option. For those organisations supporting or delivering remediation as a core activity, this represents a clear opportunity to link ISO 14001:2015 to the practice of sustainable remediation which recognises both the beneficial and detrimental impacts of remediation. In the UK, the role of site-specific risk assessment and cost-benefit assessment underpins a fundamentally sustainable regulatory framework. Whilst easily taken for granted and perhaps overlooked within an EMS, it does contribute significantly to the environmental pillar of sustainability and the goal of sustainable development. As such it is worthy of documentation in terms of aspects, objectives and performance. **Key alignment (12): Use of indicators** ISO 14001:2015 requires the definition of measurable environmental objectives. The SuRF-UK Framework makes provision for the use of indicators to assess performance of different remedial options. Furthermore, the SuRF-UK toolkit, provides Sustainable Management Practices (SMPs) (CL:AIRE, 2021) which are aligned to the indicators. SMPs are relatively simple, common-sense actions that can improve the environmental, social and/or economic performance of a project. There is a clear opportunity for an organisation to demonstrate compliance to its EMS environmental objectives using the working practices outlined by SuRF-UK Framework.
Section 7 **Support** States the organisational resource requirements to underpin the establishment, implementation, maintenance and continued improvement of the EMS. The requirements cover competence, awareness, communication and documenting information.	**Key alignment (13): Documenting information** Principle 4 of the SuRF-UK Framework is record keeping and transparent reporting. This aligns with the ISO 14001:2015 requirement for documenting information. **Key alignment (14): Communication** Good governance and stakeholder involvement are captured by Principle 5 of the SuRF-UK Framework which supports the EMS requirements on communication.
Section 8 **Operation** Sets out what an organisation needs to do to meet the requirements for an EMS in terms of organisation operations and emergency preparedness.	**Key alignment (15): Environmental protection** ISO 14001:2015 makes provision for operational activities to ensure environmental objectives are met to minimise the environmental impact of an activity. Principle 1 of the SuRF-UK Framework is to ensure remediation removes unacceptable risks to human health and the environment. The requirements for an EMS to plan and control environmental impacts are aligned with the SuRF-UK Framework to identify a preferred option that maximises environmental (social and economic) benefits. This includes management of matters such as waste management, controlling environmental emissions to air, water and land, and preventing local disturbance due to noise, vibration, dust and odour. Claims for sustainable ways of working are difficult to reconcile when basic good environmental practice is not being followed. The SuRF-UK toolkit includes Sustainable Management Practices that can support good environmental practice.

Table 1. Alignment of ISO 14001:2015 and the SuRF-UK Framework (continued).

Section 9 **Performance Evaluation** Sets out the requirements for monitoring, measuring, analysing and evaluating environmental performance; and the requirements for internal audit and management review.	**Key alignment (16): Measuring performance** At an operational level, all sustainable practices must be underpinned by measurement of environmental impacts in line with ISO 14001:2015. This would also be an expectation of any organisation carrying out sustainable remediation. This aligns with the SuRF-UK Framework Principle 4, 'record keeping and transparent reporting', and Principle 6 'sound science' including relevant and accurate data. Assessment of environmental impacts can be further enhanced if societal and economic metrics are also measured which would fully align to the SuRF-UK Framework. Presentation of metrics that measure the impact and benefit of remediation demonstrates the value of sustainable remediation and builds stakeholder confidence in the remedial approach.
Section 10 **Improvement** Describes how organisations shall determine opportunities for improvement to the EMS.	Limited direct alignment with SuRF-UK Framework.

5. INTERNATIONAL RELEVANCE

SuRF-UK has direct domestic relevance for entities operating within the UK. As already described in this document the SuRF-UK Framework is not a standards-based way of working, rather it provides a flexible framework which can be adapted for use to ensure it is compliant and relevant in other international jurisdictions. There is therefore scope for organisations to consider and adopt the alignment areas highlighted within this document if they are operating internationally in line with ISO 14001:2015.

6. CONCLUSION

There are numerous parallels and synergies between ISO 14001:2015 and SuRF-UK. SuRF-UK provides a framework and toolkit for assessing and delivering sustainable remediation. In many regards, sustainable remediation is a process-led way of working which aligns well with the principles of an environmental management system (EMS) and the Plan–Do–Check–Act (PDCA) model.

The 16 key alignment opportunities can be summarised as follows:

- Both seek to drive best practice in the context of being sustainable and contributing to sustainable development.
- Both use models that deliver the greatest sustainability gains when considerations are made early in the planning process.
- Neither are a standards-based way of working and so the boundaries within an EMS can shape how sustainable remediation practices are carried out by an organisation, including those that constrain it and those than enhance it.
- Stakeholder engagement is a key requirement of both ways of working.
- An Environmental Policy required by ISO 14001:2015 is an opportunity to commit to sustainable remediation, particularly if supporting or delivering remediation is a core activity of the organisation.
- Environmental aspects and objectives associated with land contamination can be considered in a balanced way that considers the environmental, societal and economic issues.
- All sustainable practice must be underpinned by good environmental practice, and measurement of environmental impacts in line with ISO 14001:2015. Claims for sustainable ways of working are difficult to reconcile when basic good environmental practice is not being followed.
- Good environmental performance can be enhanced if societal and economic metrics can also be measured as per an expectation of SuRF-UK ways of working.

By recognising the alignment, it can be concluded that following the principles of sustainable remediation supports compliance with ISO 14001:2015. The SuRF-UK Framework and guidance is a robust platform for implementing sustainable remediation practice. Organisations that carry out remediation in line with SuRF-UK can strengthen their EMS by recognising the role of sustainable remediation and so strengthen the requirement to embed sustainability in their organisation. Likewise, any environmentally responsible organisations that are committed to ISO 14001:2015 should have a culture of discipline, continuous improvement and ever-increasing sustainability, hence the practice of sustainable remediation is also a natural outcome of true ISO 14001:2015 compliance.

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