Sellafield Ltd

Calder Hall Environmental Management Plan

Issue 18 – September 2025

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1. Introduction

Calder Hall ceased generating electricity in March 2003, after 46 years of operation. In accordance with Government policy, work has now begun to systematically remove (or decommission) the plant and buildings associated with electricity generation at the site. Prior to commencing this work, Sellafield Ltd, the licensee of the site, were legally required to seek consent from the Health and Safety Executive (HSE) to carry out the decommissioning project.

Application was made to the HSE (now Office for Nuclear Regulation (ONR)) for consent to carry out the decommissioning project at Calder Hall in August 2004. In support of this application, an Environmental Statement was provided, which assessed the impacts of the project on the environment. Following extensive public consultation, the HSE granted consent to carry out the decommissioning project at Calder Hall in June 2005, subject to certain conditions.

Under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) (EIADR99) the ONR requires that the Licensee prepare an Environmental Management Plan (EMP) which shall:

- List the mitigation measures that are already identified in the Environmental Statement and evidence submitted [to the HSE] to verify information in the Environmental Statement.
- List the options to implement work activities where mitigation measures may be required but where selection of an option will only be possible in the future; and
- List the work activities where mitigation may be required but where assessment to identify mitigation measures will only be possible in the future.

It is a requirement of the conditions attached to the consent to describe the effectiveness of the mitigation measures over time and review annually or at a suitable frequency agreed with the Office for Nuclear Regulation (ONR). Up until June 2015 the EMP was reissued annually, however due to very little changing operationally at the facility in 2016 and 2017 it was agreed that it was not necessary to reissue an EMP for those years. The last review was issued in September 2024. This review considers any changes at Calder Hall since September 2024 and considers the planned work for the Financial Year 2025/26.

Decommissioning Objectives at Calder Hall

i) Manage the existing hazard at the Calder Hall site.
ii) Manage the progressive reduction in hazard potential on the Calder Hall site.
iii) Continue defueling of the reactors in line with Magnox Operating Plan requirements (complete).
iv) Progress items on the critical path to Care and Maintenance.
v) Minimise ongoing maintenance costs by "Backing Out" of plant and buildings by discontinuing usage and removing services.
vi) Remove other plant and buildings as resources permit.

2. Works Completed and in Progress during 2024/25

Current Status

The Calder Hall site currently comprises four reactors and associated facilities, including two turbine halls, sixteen heat exchangers, the control rod mortuary, and a series of other ancillary buildings. The majority of the facilities are redundant.

Turbine Hall A and a number of adjacent buildings are in an area of land that has been identified for redevelopment as part of the SIXEP Contingency Project (SCP), (these construction works will fall outside of the scope of the EIADR project, but need to be considered in future assessments). As such completion of full demolition and ground remediation is required in this area (See Figure 27). Completion is now forecast for mid 2027 to support the required SCP dates for this significant site priority. These works form the Calder Land Clearance Project (CLC).

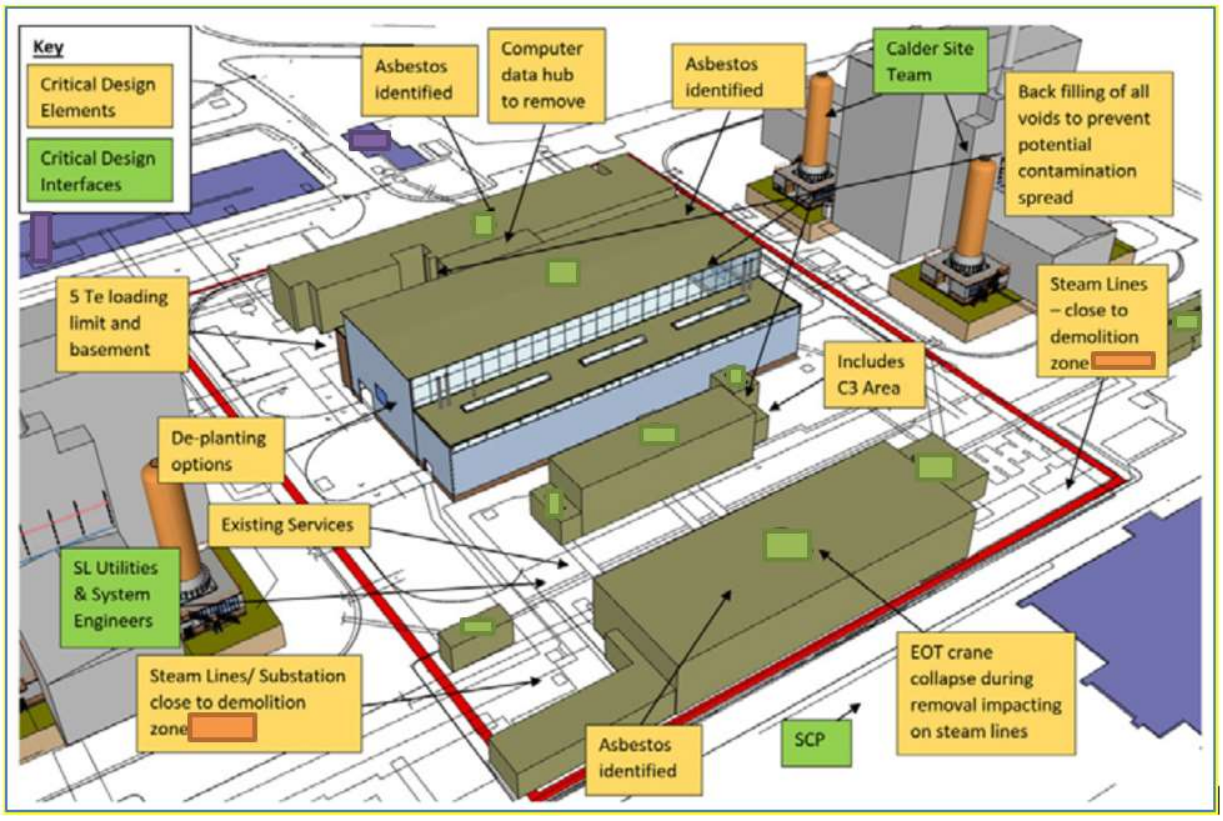

Figure 1: CLC Scope Image.

2.1. Demolition (Projects & Miscellaneous Demolitions)

Calder Hall has now reached the end of its life and decommissioning has commenced.

The Calder Land Clearance (CLC) project was initiated to clear an area within the Calder Estate that currently houses Turbine Hall A and other associated buildings including workshops ancillary and administration buildings. The clearance of required buildings has been completed with exception of Turbine Hall A.

Figure 2: Showing cleared CLC Area to SIXEP side of Calder Hall Site and Turbine Hall A access towers for facilitating Asbestos clear/de-planting

The Environmental Clean within the Turbine Hall A to enable subsequent stages of de-plant and demolition has continued. The main focus of the work remains completion of asbestos containing material removal within Turbine Hall A. In parallel to this, design work was commenced to assess the Electrical Overhead Travelling Crane (EOTC) within the turbine hall for refurbishment to then be utilised to de-plant the turbines and larger plant items. This review concluded that this would be excessively costly and parallel work looking at Turbine Hall B de-plant and demolition delivered an alternative option utilising demolition equipment to de-plant and demolish working through the building in a North to South direction, which removes need for EOTC use. This approach is now being adopted for TH-A too.

There is also a general deterioration of the aging facilities on the Calder Hall site, with some buildings such as the turbine halls being in a poor condition. Substantial asset care interventions will be required on buildings if they are not demolished promptly due to increased asset care and maintenance costs.

At time of writing focus on pipebridges between the reactors and Turbine Halls has continued. Priority was placed upon removal of pipebridges and some remaining high-level pipework at the reactor ends due to degraded condition.

Figure 3 Reactor 1 – Reactor side pipework only to clear

Figure 4 Reactor 2 – Pipework/pipebridges fully cleared

Figure 5 Reactor 3 – TH-B side cleared

Figure 6 Reactor 3 – Reactor side still to clear

Figure 7 Reactor 4 – Reactor 4 to TH-B fully cleared completion

Figure 8 TH-B Water Treatment Plant Sump infill

Figures 3 – 8 Showing current status of pipebridges and Water Treatment Plant Sump at time of writing

Work has also continued to remove other redundant facilities to provide visible progress and improved access for future Reactor and Turbine Hall demolition. All Fuel Route Control Cabins and Reactor 4 Gallows Hoist have been demolished (Figures 9-12), along with the waste store south of TH_B. The largest Gallows Hoist for Reactor 2 being planned for imminent demolition at time of writing (Figure 13). Work has also commenced in removing the light scrub and bushes around the Reactors 3 & 4 Cooling Tower wet and dry bay pumping bay basins to allow for northward expansion of the Waste Park at the northern side of Calder Hall (Figures 14-16). This in part supports siting of the new SEAP Facility discussed in Section 4. Relocation

of the four A1M flasks, plus those at the Mortuary Store remains outstanding and on hold at present.

It is likely that at some point following removal of the Reactor 2 Gallows Hoist, that the area between Reactors 2 and 3 will be used to consolidate storage of flasks and other pieces of equipment pending assessment and subsequent treatment/disposal.


Figures 9 & 10 - Before and after example for each Reactor Fuel Route Control Cabin now all demolished.



Figures 11 -13 – Before and after Reactor 4 Gallows Hoist dismantling/demolition and Gallows Hoist 2 imminently to be dismantled/demolished



Figures 14-16 – R3 & R4 Pumping Basins to be demolished and infilled

2.2. Asbestos Removal and Other Minor Decommissioning Activities

Over the last few years work has been ongoing to improve the conventional safety in the area through commencement of minor decommissioning activities such as asbestos removal, removal of high voltage electricity cables, service strip out, waste removal and building cladding enhancement.

Asbestos Removal

During 2024/25, significant amounts of asbestos have continued to be removed from the Calder Site.

Thermal insulation and waste removal locations (Notifiable) from the following areas:

- Reactor 2 Circuit 5 Bottom Elbow. (Asb debris removal – licensed)
- Reactor 2 Level 2 Left & Right side Annexe. (Asb insulation removal – licensed)
- Reactor 2 Phase 1 Back stairs. (Asb insulation removal – licensed)
- Reactor 2 Phase 2 Back stairs. (Asb insulation removal – licensed)
- Reactor 4 Phase 1 Back stairs (on going in 2025/26). (Asb insulation removal – licensed)

Other Non-Notifiable asbestos works:

- Reactor 3 enabling work asbestos cement removal.
- Reactor 4 Long Blower House asbestos cement removal after Bridge removal damage.
- Reactor 4 Top Duct High Level Skirts asbestos cement removal.

Activities ongoing and planned for 2025/26 and for Cyclone Filter Houses extending into 2026/27:

- Reactor 4 Level 2 Annexes pipework & auxiliary blower (ongoing)
- Reactor 4 Cyclone Filter Houses (Circuits 6,7&8)
- Reactor 4 Annexe roof high level skirts (Circuits 5&6)
- Reactor 2 Cyclone Filter House (Circuit 7)
- Reactor 3 Cyclone Filter House (Circuit 4)

2.3. Reactor Decommissioning Activities

Removal of redundant reactor equipment

Since defueling was completed in August 2019, the redundant Reactor Pile Cap Fuel route equipment (including Discharge and Charge Machines) have all been removed and disposed of on all Reactors. For Reactors 1 & 4 all de-planting operations to disconnect and remove the redundant vertical fuel route equipment previous utilised within the pile cap areas, discharge wells, reactor backstairs areas and discharge bays. Work was then completed to dismantle and dispose of the Coffin Bogie, Bolting Station, Lid Lifter and Nitrogen Purge.

During 2024/25 the following were completed against programmed works:

- All remaining Primary Circuit GEN springs were removed following on from Reactor 4 in previous F/Y totalling 32 GEN springs.
- Reactor Blower House encapsulations have occurred where repairs have been merited.
- Calder Reactor windowpane refurbishments – North and South sides of all reactors completed, East side planned in 2025/26 subject to funding and access availability.
- R3&R4 Pumphouse degraded rooves and walls repairs – Repairs completed on all four reactors.

- Reactor roof repairs – patch repairs carried out as required/accessible. 15 patch repairs planned for R3 Pile Cap Roof in 2025/26 funding/access dependent.
- Fire detection system replacement for all reactors – Initial work completed, but currently paused for design review. Existing Systems operable and healthy, replacement largely only driven by known medium term future obsolescence requirements, not yet driving replacements.

Removal of Blower House Desiccant

The removal of the ILW contaminated desiccant is required from Humidrier systems prior to the demolition of the blower houses. The methodology for the removal of this inventory has been considered to ensure application of Best Available Technique (BAT) and As Low as Reasonably Practicable (ALARP). This ensures that environmental risks, handling requirements and therefore dose are all reduced where possible.

At the time of writing, to facilitate demolition of the first two Short Blower Houses (SBH) all desiccant has been removed from Reactors 1 and 4 SBHs and routed for disposal. De-planting prior to demolition is ongoing and will continue throughout 2025/26.

Reactor Pipebridge Removals

Sellafield undertook an assessment of the pipe bridge in response to the Office for Nuclear Regulation's (ONR) concerns. Reactor 2 pipebridge was removed as priority due to degraded condition. Following this, the removal of the pipe bridge which spans from Turbine Hall B (THB) to Reactor 3 was prioritised. The extent of the removal includes the following:

- Section A- Across adjacent Street (and above active steam lines and water service).
- Section B1- Tower A to Tower B1.
- Section B2- Tower A to Tower B2.
- Section C1- Tower B1 to Long Blower house.
- Section C2- Tower B2 to Short Blower house.

Protection of the main steam lines into Sellafield site from Fellside made the Reactor 3 to Turbine Hall B (TH-B) particularly onerous to remove at the Turbine Hall B side. Section A dismantling/demolition is complete (Figure 5).

Reactor Works planned for 2025/26 and beyond.

Reactor 1

- MEWP operation for asbestos sheet removal & possible roof sampling of the Short Blower House (SBH)
- SBH de-planting work to continue followed by demolition as stretch target for commencement late 2025/26, but may move into 2026/27 F/Y.
- Full deplanting of the Cyclone and By-pass filter rooms on Reactor 1 CCT2 and 3 in 25/26 FY.

Reactor 2

- External staircase removal from the pump houses utilising demolition machines
- Repair work to the building fabric after the earlier pipebridge removal utilising a MEWP

Reactor 3

- Reactor 3 Pile Cap Roof patch repairs (15 off)

Reactor 4

- SBH de-planting work to continue prior to demolition 2026/27 as a stretch target
- Remedial works after earlier pipebridge removal utilising a MEWP

Pipebridges

- Priority for removal of two remaining pipebridge sections at Calder Hall is for Reactor 3 (Figure 6) during 2025/26, with Reactor 1 following priority dependent in 2026/27 (Figure 3).

2.4. Turbine Hall B Pre-demolition work tasks

Following discharge of the water from the demolished water treatment plant sump, as part of which a significant number of smooth newts were recovered and rehomed, sediment sludges and concrete structure were sampled, characterised and disposed as appropriate.

At time of writing, following successful removal of the redundant steam lines reported previously, the subsequent Water Treatment Plant Sump demolition and infill works have just been completed (Figure 8). This largely completes works to provide safe external access to TH-B West side to support future Turbine Hall B de-planting and demolition.

Internally works have continued to remove wastes and address conventional safety hazards, including refurbishment of the south staircase, fire doors all repaired or replaced to provide requirements for safe re-occupancy to widen soft strip works. The roof on the west side is to be patched to make it safe in 25/26 FY. Again, at time of writing the high-level hanging trunking/cable/lights have been removed to remove the hazard as part of re-occupancy requirements (Figures 17 & 18).

Figures 17 & 18 Showing High Level restricted access trunking and rope access removal ongoing

Turbine Hall B – Ecology Survey

The requirement for bat and bird roosting surveys was identified prior to progressing Turbine Hall B demolition. The first survey took place on 1st August 2024: The Preliminary Environmental Assessment (PEA) paper produced identified bats were active in the area, but none visually seen emerging or returning to the building during the survey. However, this was not conclusive. A further survey in 2024/25 found further evidence of bats, but again no bats were visually observed, and it is believed they are using the building as a day roost. From evidence found it indicates that they are using the battery room specifically as a roost. Accordingly, whilst de-planting works are allowed within the building a 10m quiet area exclusion zone around the room has been put in place. Annual surveys will be continued and prior to demolition a de-roost process will be followed utilising licensed contractor.

Building adjacent to Turbine Hall B Waste & Hazard Removal

As part of the Turbine Hall B delivery strategy another scope of the work was to soft strip the interior of the adjacent building to remove hazards & waste. During 2024/25 this work continued, the transformer bays were cleared of waste accumulation in preparation for future de-planting and preparing for the mercury containing arc rectifier removal and routing planned 2026/27.

TH-B Work planned for 2025/26 and beyond.

- Completion of post operational wastes disposals and addressing remaining conventional safety hazards throughout Turbine Hall B (60te Waste removed to date).
- Removal of redundant electrical equipment from Turbine Hall B. – High level hanging equipment removed, continued removal will be ongoing.
- Removal of redundant oil systems for Turbine Hall B to allow later de-planting/ demolition (bulk oils already removed). – With occupancy restored preparations will continue in 2025/26 for 2026/27 removal of remaining oils i.e. from known/assessed low points etc.
- Asbestos R&D survey of the cable tunnels from TH-B to Reactor 3 – To be conducted 2025/26 along with full survey of TH-B.
- Commencement of strip out works within the redundant cable tunnels to the southeast of Turbine Hall B.
- West side roof to be patch repaired to provide structural integrity by securing roof panels and reduce rainwater ingress.
- De-planting and demolition of Turbine Hall B – De-planting to commence 2026/27 with final demolition 2027-2029.
- Type 1 aggregate will be used to level the compounds to the West and East of the TH-B to prepare those areas to be used for waste sort and segregation during movement to large equipment de-planting and subsequent building demolition.

3. Use of Chemical Disposal Hub at Calder Hall

The chemical hub is now in its fifth year of operation and disposals of legacy chemicals from across the enterprise continued being prepared, packed and disposed of from the chemical disposal hub during 2024/25.

4. New Project related activities:

4.1. SEAP (Site Emergency Assembly Point)

The main Administration Building at Calder Hall that previously functioned as the Calder Facilities Site Emergency Assembly Point was demolished in April 2024 as part of Calder Land Clearance (CLC) to provide land for SIXEP Waste Management (SWM). As such, a site has been identified to the west of Reactor 4 / Turbine Hall B to site a new portacabin style SEAP, with office accommodation and welfare facilities.

There is a legal requirement for Site Emergency Assembly Point (SEAP) provision (Nuclear Site Licence Condition (NSLC) 11).

Figure 19 – Artist Impressions of SEAP Elevations

Completed works in the last 12 months:

- Waste has been removed from the F10 plot in preparation for future construction works.
- Vapour testing package of work undertaken to test for any Chlorinated solvent contamination on the F10 plot.
- Single discipline design reviews completed for mechanical, electrical and civil disciplines with the Multi discipline design review scheduled for mid-October 2025.
- Building regulations pack compiled and engagement sessions held with Sellafield planning team.

SEAP Works to be completed in the next 12 months:

- Excavation of new service trenches for SEAP facility.
- Installation and commissioning of the new SEAP facility (Figure 19).

4.2. Electrical Distribution Network Upgrade Programme (EDNUP)

As part of these works which skirt the Calder Hall site, during 2024/25 the Transformer/Gridyard has been cleared, both remaining Pylons de-cabled and one demolished. The second has been refurbished for future reconnection (See Figure 20).

Figure 20 Remaining refurbished Pylon and cleared Gridyard

4.3. Heat Exchanger Decommissioning and Calder Land Clearance (CLC)

Heat Exchanger Decommissioning

The Heat Exchanger removal Project ongoing has continued. This is for preparation of six of the Heat Exchangers for removal that need to be lifted and lowered to ground to support access for the SiXEP Contingency Project (SCP). This project is split into a number of stages:

- Asbestos strip.
- Bellows and Elbows removal.
- Heat exchanger group one removal and laydown (HEx1).
- Heat exchanger processing and disposal (Hex 2) covering both groups.
- Heat exchanger group two removal and laydown (Hex).

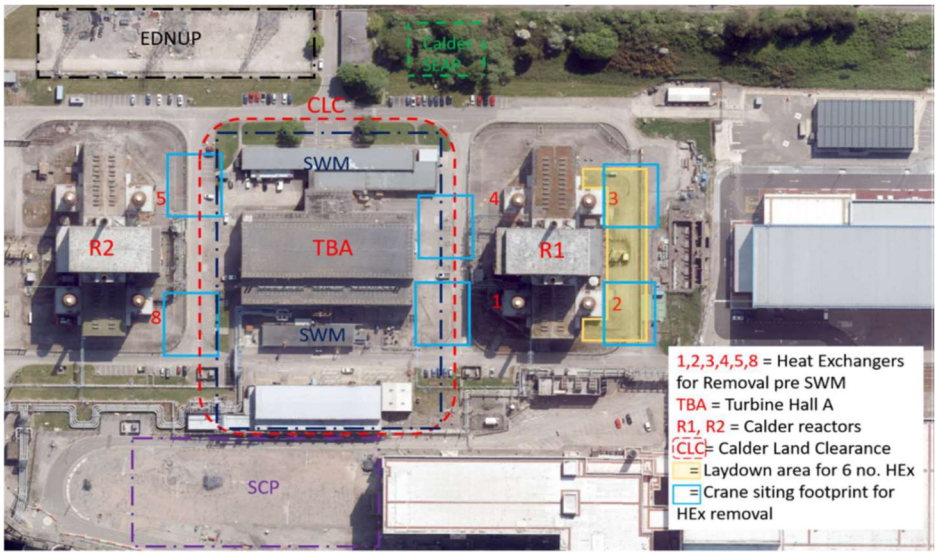

Figure 21: Location of CLC Demolition scope surrounding Turbine Hall A.

All required asbestos strip and elbows and bellows removal as pre-work to support Hex 1 is completed. All Reactor 1 circuits and Reactor 2 circuits 5 & 8 elbows and bellows (16 in total) have now been removed, characterised and disposed from Calder site; routed for metals recycling.

At time of writing, HEx 1 Project has completed the following works:

- 5 Boreholes completed (Figure 22), factual and interpretive reports produced, and information used to inform laydown area design for the Heat Exchangers once de-planted.
- 8 trial pits completed, and ground characterisation report produced. (Figure 23)
- Heat Exchanger laydown area prelim design completed and progressing with detail design.
- Crown Commercial Services identified as new commercial route for the main lifting/design contract, tender pack completed by HEx 1 project team, issued to CCS and returned tenders currently under review in advance of contract award.

Figure 22 Hex 1Borehole drilling

Figure 23 Hex 1 Sample test pit

HEx 1 planned project works 2025/26 into 2026/27

- Main design/lifting contract awarded.
- HEx 1 laydown area detail design completed.
- Laydown area installation contract placed and siteworks commenced.
- Prelim design completed on Heat Exchanger De-Planting lifting plan.
- Prelim design completed on lifting collars for the de-plant of the Heat Exchangers.
- Asbestos surveys to be carried out in the Reactor 1 pumphouses circuits 2 & 3 in 2025/26 as enabling work for subsequent Hex removals

Calder Land Clearance (CLC)

During the last 12 months the CLC project has continued with the additional Asbestos Containing Materials (ACM) cleaning scope of work. The Steam Distribution areas have now successful received 4th Stage Clearance. In addition, the temporary works design for the turbines, the dump condensers and the trenches has been completed. This allows for the scaffold and the air fed enclosures to be erected to allow the clean to commence (See Figures 24 & 25).

Figure 24 - TH-A Scaffold Structure

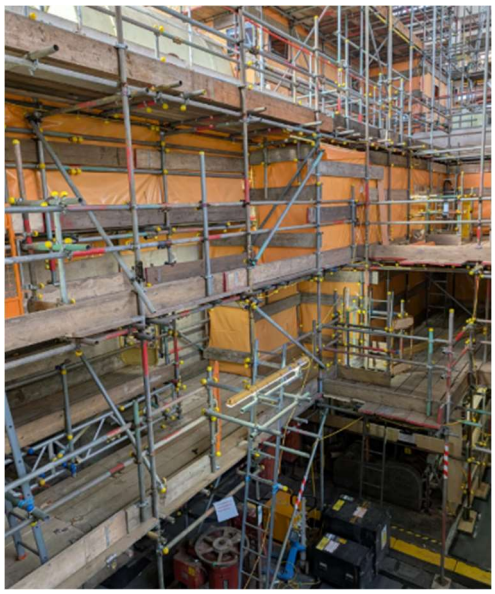

Figure 25 – TH-A Asbestos Enclosure

Over the next 12 months the project plans to complete the asbestos clean within the turbine hall which will then allow the de-planting to commence in the new calendar year.

Ongoing discussions are being maintained with the SIXEP Waste Management Land Prep (SWMLP) project regarding accessing the West Side of Site and with completion of demolition of all workshops and backfill of subsurface ducts access has been provided for borehole investigation work. The project teams continue to work collaboratively to allow the three Projects, TH-A/CLC, Hex 1 and SWMLP/SIXEP Waste Management Receipt Facility projects to continue to progress their scopes of work. Sequencing of the projects is key within the area.

- For SWMLP planning is underway for the next phase where old services will be removed and ultimately new service trenches and required services installed skirting the west side of the CLC area.
- The West Side of Site has been handed over to SWMLP for the precursor borehole work to commence last quarter 2025/26 (See Figure 26) with a total of 18 boreholes planned to provide subsurface characterisation and improved groundwater monitoring. The borehole work will provide the Calder Hall area with three reinstated boreholes and three new Boreholes (circled) for the longer-term groundwater monitoring.
- The land will then be handed back later to allow the safe demolition of the Turbine Hall superstructure planned to commence in the latter half of 2026.
- The Hex 1 Project will commence work to the south of reactor 1 for installation of the concrete pad, stands and drainage utilising the southern end of the CLC area once the borehole work is completed.
- Once the other two works are progressed the cleared CLC area, including the demolished TH-A footprint will be fully handed over to the SWMLP/SWMRF Project for Services install/diverts and the project excavation and build (See Figure 27).

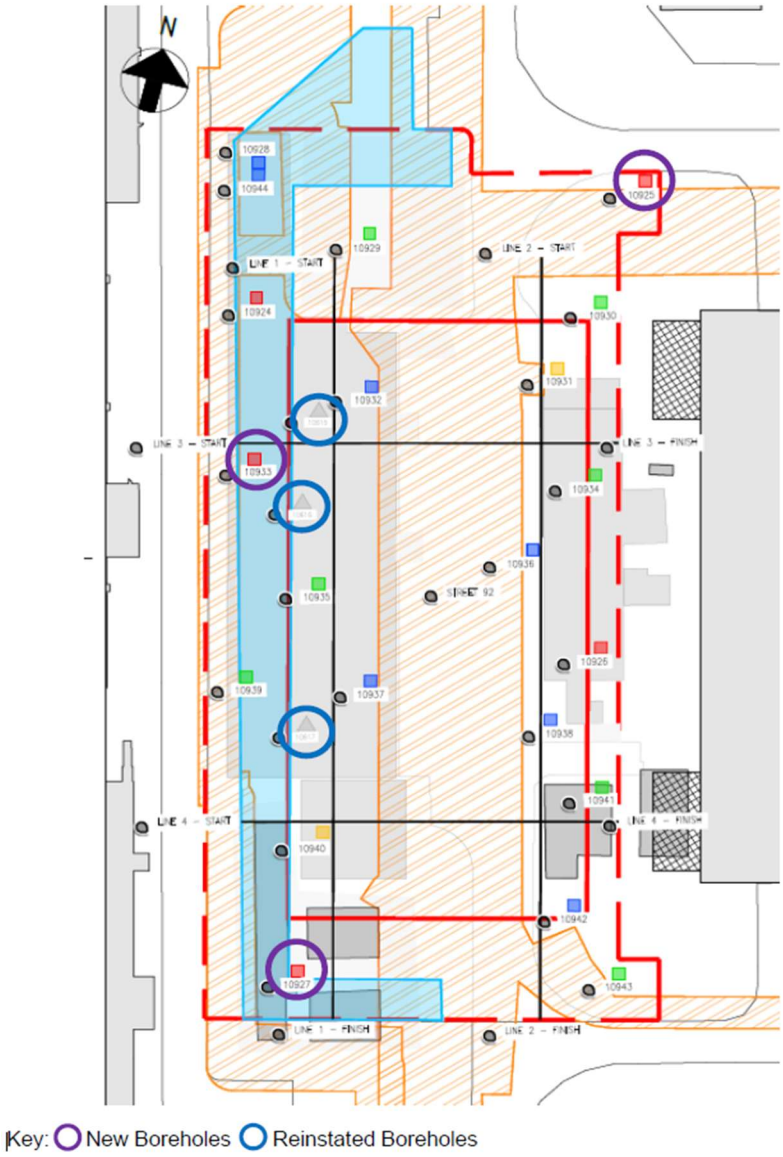

Figure 26: Planned SWMLP Borehole locations with circled permanent

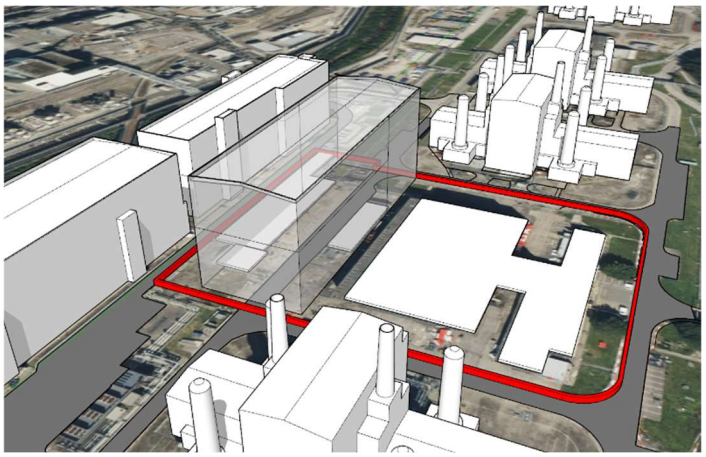

Figure 27 Nominal Layout of SIXEP/current SCP build ongoing and SWMRF outline with TH-A/demolished Admin building slab outline

5. 2024/25 Progress Impact on EIADR

No requirement for a Finding Of No Significant Effect (FONSE) form has been identified for 2024/25 or planned 2025/26 works.

6. Environmental Performance and Mitigation Measures

It is a requirement of the conditions attached to the EIDAR consent that this EMP reports on the effectiveness of the mitigation measures over time.

There are no significant changes to the mitigation measures that were submitted in the original Environmental Statement.

Assessment of mitigation measures has concluded there is no potential for decommissioning work at Calder Hall planned for 2024/25 and beyond to cause any significant environmental effects, based on the following criteria (used in Calder Hall's Environmental Statement, submitted under EIADR 1999):

- Air quality and dust.
- Archaeology and cultural heritage.
- Ecology.
- Geology, hydrogeology and soils.
- Landscape and visual.
- Noise and vibration.
- Surface waters.
- Traffic and transport.

7. Conclusions

There have been no significant changes or degradation to environmental performance since Issue 17 of the EMP was written in September 2024.

There have been no significant changes or extensions to the Decommissioning Project since the Environmental Statement was written in 2004, up to end of FY 2024/25.

Decommissioning work ongoing or planned for Financial Year 2025/26 is not expected to have a significant adverse effect on the environment, and therefore does not require further assessment under EIADR. Any other scope changes or any new/changed minor impacts will be reviewed and captured in a FONSE as appropriate.