1 Purpose

This document provides information on how to manage Polychlorinated Biphenyl (PCB) contaminated fluids or equipment during maintenance and/or decommissioning activities. This guidance is supplementary to the requirements set out in the *Level 2 Environment and Social Minimum Requirements – Design and Construction (ESR-DC) standard NR/L2/ENV/015*.

1.1 Definitions

PCBs are man-made organic compounds that were frequently used as dielectric insulation and coolant fluids in electrical apparatus.

PCBs, PCB Substance or PCB fluid – any substance, normally a fluid, containing PCBs, including a mixture of different PCBs, at a combined concentration of more than 50 parts per million (ppm) (0.005%).

PCB 'Contaminated Equipment' (CE) – Equipment that contains 5 litres or more of a PCB Substance (a fluid with a combined PCB concentration of more than 50pmm (0.005%).

1.2 Risk

PCBs are a hazard to both humans and the environment due to their toxicity. For humans, PCBs can be absorbed through the skin and vapours can be inhaled; ingestion has not been eliminated as a route of entry thus operatives shall not eat, drink or smoke during handling operations. PCBs may be an acute irritant; however their main risk is that they are toxic through cumulative effects linked to health impacts of liver damage, as well as a carcinogenic relationship. For the environment, PCBs are classified as persistent organic pollutants (POPs) because they are resistant to degradation, acutely toxic to aquatic organisms and bio-accumulate in the food chain.

1.3 Law

In 1986 the use of PCBs was banned in all new equipment, however older equipment may still be found with PCB contamination. Even new equipment may have become cross-contaminated during maintenance by the use of reclaimed/recycled oils.

Since 2010 it has been illegal to hold PCBs or equipment containing any volume of PCB contaminated fluid at a concentration of more than 50ppm (0.005%), apart from very specific exemptions. Please refer to section 2 for information on the exemptions relevant to Network Rail.

Persistent Organic Pollutants (POPs), including PCBs, are controlled under the terms of the Stockholm Convention on POPs. The United Kingdom has signed up to the Convention, and must stop using equipment and oils containing PCBs by 2025.

2 Prohibited equipment and PCB exemptions

Exemptions relevant to Network Rail
The following items were exempt from the 2010 PCB ban but shall be disposed of as soon as possible at the end of useful life:

a) **Transformers**: Exempt where the fluid in the transformer has a PCB concentration at or below 500 ppm (0.05%). However, these are still classed as contaminated and shall be included on the Network Rail PCB register as an 'Exempt' item;
b) **Small components**: Small items of equipment that contain PCBs may remain in service until the end of useful life if both these conditions are true:
   - they do not individually meet the 'contaminated equipment' definition in section 1.1.
   - they are components in a larger item of equipment that is also not defined as 'contaminated equipment'.

   NB. The small components exemption **does not** apply if it would be reasonably practicable to remove the small component to dispose of the PCBs without damaging the larger equipment.

Please note: Assets carrying less than 5 litres of PCB fluid at a concentration of more than 50ppm that are neither exempt transformers or small components (as per section 2 a and 2b) are NOT exempt from the 2010 PCB ban and SHALL be disposed of as soon as possible. These items **do not** however require annual registration (see section 3).

3 Registration

All non-exempt PCB contaminated equipment **and** exempt transformers across the Network Rail estate SHALL be included in a Network Rail PCB register for annual submission to the Environment Agency.

Safety, Technical and Engineering (STE) currently coordinate the compilation of a centralised PCB register for Environment Agency reporting. However, Route Asset Managers in each Route Business shall maintain a local schedule / register and assure themselves that it is an accurate representation of the PCB contaminated equipment within their asset portfolio.

Registration is **not** required for:

a) Equipment containing less than 5 Litres of PCB contamination that is also not a transformer;
b) Small PCB contaminated components within larger apparatus – as described in section 2b.

When equipment is to be decommissioned or otherwise removed from the register it is essential to collate comprehensive evidence of PCB testing/analysis and fully completed waste disposal documentation to support the de-registration process.

The current Environment Agency guidance for yearly registration of PCBs, states that where organisations "have plans and dates for disposing of or decontaminating transformers that are still in

use and contain 500ppm or less of PCBs (500ppm is equal to 0.05% or less)" they should provide details of these plans during annual registration. This is despite the fact that you can keep these items until they reach the end of their useful life.

Please note: Route Asset Managers are accountable to satisfy themselves that their local Route register, and consequently the central STE register, is complete and accurate with respect to assets in their area of responsibility.

4 Duty of Care – disposal of fluids or equipment contaminated with PCBs

Network Rail is accountable for ensuring that items of equipment containing PCBs are decontaminated responsibly, that oil products and/or contaminated equipment are correctly classified as hazardous waste (England & Wales) / special waste (Scotland), and that the waste products are transported, received and disposed of by appropriately licensed waste contractors. These duties sit with the Route Asset Manager for each PCB contaminated asset and ultimately with the Director of Route Safety and Asset Management (DRSAM) in each Route Business.

When seeking to remove equipment from the statutory PCB register records of sampling and analysis **shall** be collated and provided to verify the contamination status of equipment. Full chain of custody records for the contaminated materials **shall** also be collated and provided to support de-registration and hazardous waste/special waste duty of care requirements.

Route Asset Managers shall:

a) Ensure that you have an accurate local schedule / register of all PCB contaminated equipment under your area of responsibility. Equipment with insufficient evidence to prove the absence of PCB contamination should be treated as PCB contaminated until proven otherwise;
b) Ensure that items of equipment are accurately and individually identifiable i.e. have a unique asset number and a specific address rather than colloquial name and location;
c) Ensure that you have documented sampling analysis reports from accredited laboratories for each piece of PCB contaminated equipment. Sampling and analysis reports from accredited laboratories may also be needed to prove decontamination of pre-1986 equipment unless other forms of evidence are available;
   Note: An accredited laboratory is an analytical laboratory that has been accredited by the United Kingdom Accreditation Service (UKAS) to ISO/IEC 17025: *General requirements for the competence of testing and calibration laboratories*.
d) Ensure oil change histories are recorded and appropriately documented so that reductions in PCB concentration can be readily traced and explained;
e) Ensure that waste oils and discarded apparatus are correctly classified and allocated to the correct European Waste Catalogue (EWC) code as per the UK List of Wastes Guidance. All oils are classified

as hazardous waste/special waste regardless of their PCB concentration. However oils with PCB contamination ≥ 50ppm need a different EWC code and shall be disposed of as PCB Hazardous Waste (Special waste – Scotland) for incineration only;

Table 1 – Summary of EWC codes for oils

Waste Oil Type	Waste Status	Contaminated with PCBs	Mineral-based and chlorinated	Mineral-based and non-chlorinated	Synthetic	Readily biodegradable	Other oils
Hydraulic oils	Hazardous	13-01-01*	13-01-09*	13-01-10*	13-01-11*	13-01-12*	13-01-13*
Engine, gear and lubricating oils	Hazardous	N/A	13-02-04*	13-02-05*	13-02-06*	13-02-07*	13-02-08*
Insulating and heat transmission oils	Hazardous	13-03-01*	13-03-06*	13-02-07*	13-02-08*	13-02-09*	13-02-10*

(*) An asterisk at the end of a code means the waste is hazardous

Note: Transformers that have been fully flushed and drained before disposal may be classified as non-hazardous waste, as long as there is analytical evidence that the final flushing oil reached a PCB concentration <50ppm (0.005%). It is recommended that evidence of flushed and drained equipment disposal (Waste Transfer Notes) be retained for a minimum of 3 years to support de-registering;

f) Upon disposal of oils or contaminated equipment the complete and valid Consignment Notes (for hazardous waste/special waste) and/or Waste Transfer Notes (for non-hazardous waste i.e. equipment flushed and proven to be de-contaminated) shall be collated and retained for a minimum of 3 years.

A decision chart for disposal of oils and equipment is provided at **Appendix A**. Please note this is a highly simplified decision model and does not describe any of the detailed controls that must be in place when managing the disposal and record keeping for oils or contaminated equipment.

5 Signage

5.1 Signage of PCB contaminated equipment and premises

All items of PCB 'contaminated equipment' shall have an attached label or sign similar to Figure 1 stating that the equipment contains PCBs. The label / sign shall be indelible, durable, of a size and location that makes it clearly visible, and not easily removed.

Signs shall also be attached to the premises where the equipment is housed stating that the premises contain equipment contaminated by PCBs.

Transformers where the fluid has a PCB content of less than 0.05%, may be labelled to say, 'PCBs contaminated <0.05%'.

Figure 1

5.2 Signage of PCB contaminated oils for transportation and disposal

All information shown in Figures 2 and 3 (including the three warning diamonds together with the word "DANGER") shall appear on all containers transporting oil containing PCB irrespective of its concentration (499 – 1 ppm).

Hazardous Material	Hazardous to the Environment	Serious Health Hazard (carcinogenic)
		

Figure 2

Classification Information	
Emergency action code	2X (PCB is usually contained within other oils and a higher emergency action code might be appropriate for the oil containing the PCB.)
UN number	2315 (The United Nations number might be different if it relates to the oil containing the PCB rather than the PCB itself.)
UN hazard code	9 - Miscellaneous hazardous material
CAS number	0001336 - 36 - 3
EC number	215 – 648 – 1

Figure 3

Figure 4

The X sign above (Figure 4) has been replaced by the serious health hazard diamond shown in Figure 2. **The Figure 4 X symbol shall not be used.**

6 Decommissioning of equipment by projects

6.1 Exchange of information

When projects decommission equipment the exchange of information between the Route Asset Manager (RAM) and the project team is critical.

The RAM (or the RAM's authorised representative) shall:

Provide the project team with clear information about the PCB contamination status of **each** asset that the project team will encounter, including for example:

- The unique asset number;
- An accurate technical description;
- The oil capacity;
- An accurate location (preferably geospatially mapped using GPS coordinates);
- The latest known PCB contamination status with records of oil analysis data.

The project team shall provide the RAM (or the RAM's authorised representative) with:

- Any additional oil sampling and analysis data taken **prior** to disposal, including flushing oil analysis;
- Valid and accurately completed waste documentation as follows:
    - For PCB-contaminated **oil** hazardous waste (special waste in Scotland) - the Consignment Note, including the Part E declaration from the party who received the PCB oil waste for incineration;
    - For non-PCB contaminated **oil** hazardous waste (special waste in Scotland) - the Consignment Note, including the Part E declaration from the party who received the waste;
    - For PCB contaminated **equipment** - the Consignment Note, including the Part E declaration from the party who received the waste item. (NB. The type of waste documentation will depend on whether the drained equipment is still classified as PCB contaminated or has been purged);
    - For fully flushed and drained equipment with analytical evidence to show that the final flushing oil reached a PCB concentration <50ppm (0.005%) – the Waste Transfer Note, including the Part E declaration from the party who received the waste item.

Note: Project teams shall retain copies of any documents provided to the RAM (or the RAM's authorised representative).

6.2 Environment and Social Management Plan (ESMP)

The ESMP template includes a revised checklist to be followed when decommissioning and disposing of oils and/or equipment that may be contaminated with PCBs. The ESMP template and PCB disposal checklist can be found on Safety Central.

7 Human and environmental hazard mitigation

- Avoid contact with PCB directly or with any oil containing PCB;
- Impervious clothing shall be worn, this includes: overalls, aprons, gauntlets and boots;
- PPE is not guaranteed to protect against PCBs, therefore all efforts shall be made to prevent the oil spilling or splashing on to the PPE.

7.1.1 Decanting

- The decanting of oils containing PCBs from installations shall only be done by competent, trained operatives wearing appropriate PPE; other persons shall be kept well away;
- Containers shall be impervious and capable of being completely sealed to avoid spills, slops or vapours. They shall be certified as being mechanically sound without defect or weakness that could lead to a leak or failure in the containment;
- It is recommended that oil transfer from the installation to the disposal container is completely sealed. Where this is not possible, full face protection shall be employed. If the agitation is likely to give rise to vapour then appropriate respiratory protective equipment (RPE) shall be used;
- Oil temperature has a direct effect on the amount of vapour that may be given off when the oil is transferred. Wherever possible oils should not be moved if they hot. If there is a possibility of inhaling vapours during handling or transfer operations then appropriate RPE shall be used
- Any spill shall be contained and collected; materials used to absorb and/or contain spills shall be disposed of as hazardous waste with full valid Consignment Note documentation.

Note: Mixing of oils from different items of equipment into combined disposal containers is strictly prohibited.

7.1.2 Avoiding spills when moving oils containing PCBs

- Wherever possible oils containing PCBs should be decanted directly onto containers which are secured to the vehicle;
- Manual handling of PCB contaminated oil containers should be avoided where possible, however if unavoidable, all pathways should be kept clear to reduce trip hazards;
- Controls in place to contain the capacity of the largest container being used should it fail catastrophically;
- When containers have been filled they shall be removed from site in accordance with a method statement agreed between the asset owner, the contractor undertaking the decommissioning works, and the designated hazardous waste carrier (special waste in Scotland);

- The method statement shall stipulate a maximum time limit (suggest no-longer than 3 working days) between the draining operation and the removal of the hazardous waste/special waste oils by the licensed hazardous waste carrier (special waste in Scotland). This minimises any risk that oil storage vessels are damaged whilst on site.
- Where oil storage vessels must remain on site after equipment has been drained, only up to the agreed maximum time period, the oil storage vessels shall be stored in an area where they are safe from collision with manoeuvring vehicles or mobile plant, or other physical trauma that could damage or destabilise containment.

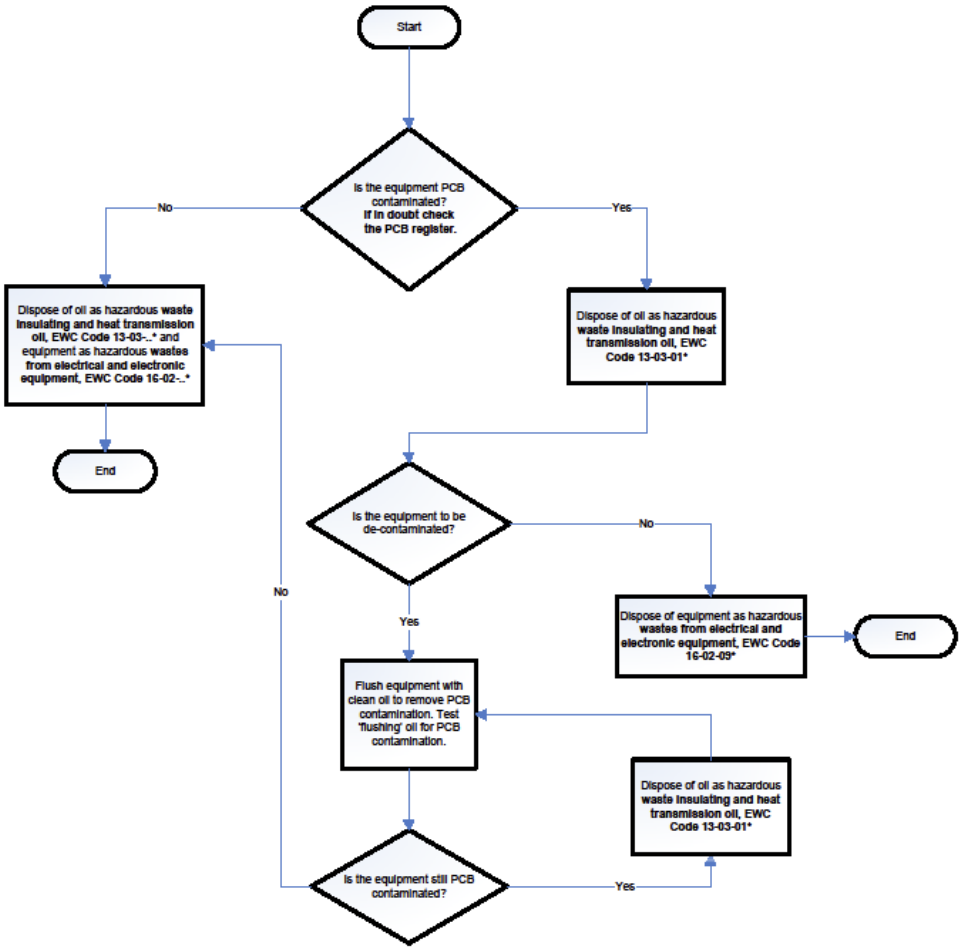
7.1.3 Transport

- During transportation of oils with PCBs, the vehicle shall be capable of securing the containers in a way that prevents them moving or overturning;
- Ensure vehicles transporting the containers are capable of containing a catastrophic failure or the overturning of largest volume container. Sufficient absorbency shall be available to cope with the volume that could be liberated by the largest container should it fail/overturn.
- The vehicle shall be conspicuously marked as shown in Figure 2 – including the UN number and emergency action code;
- Person(s) in the vehicle shall have a TREMcard document in their possession that explains the nature of the cargo they have and that the oil contains PCBs. The volume of both oil and its PCB fraction shall be identified and this has to be immediately available to any emergency service that attends an incident involving the transporting vehicle (fire, traffic collision etc.). This document shall include contacts for the organisations involved in the removal of the oils (client, contractors etc.) and the Environment Agency, Scottish Environmental Protection Agency, or Natural Resources Wales as applicable.

8 Further Guidance

- Environment Agency - Form Guidance WMB1: Application for yearly registration of polychlorinated biphenyl (PCB) holdings.

Appendix A - Summary disposal flowchart for equipment and oils



The complete European Waste Catalogue (EWC) codes and descriptions can be found at www.gov.uk/government/uploads/system/uploads/attachment_data/file/427077/LIT_10121.pdf
Table A1.1:H1 List of Waste chapters and their order of precedence