

Electricity Supply Board
One Dublin Airport Central
Dublin Airport
Cloughran
Co. Dublin

31 July 2020

ESB Reference
Site 18

Our Reference
PR-427640

Preliminary Site Assessment – Proposed Site Investigation & Additional Monitoring – Site 18 Francis Street – Inchicore 110 kV

AECOM Ireland Limited (AECOM) completed a Preliminary Site Assessment (PSA) of a cable fluid leak on a 110 kV underground electrical cable running from Francis Street to Inchicore in Dublin City on behalf of Electricity Supply Board (ESB). The location of the leak is adjacent to the Jamestown Business Park on the Grand Canal. The PSA report was issued on 31 July 2020 (Report Ref. PR-427640_ACM_RP_ENV_008_9). AECOM understand that ESB has undertaken these works on behalf of ESB Networks.

It is estimated that 9,370 litres of cable fluid was released between May 2011 and November 2014. It is assumed, based on information provided to AECOM by ESB, that the fluid lost was a mixture of LAB and mineral oil based products. It is noted no mineral oil was detected during surface water and sediment sampling of the canal and drain; however, in order to provide a conservative approach to the PSA, it is assumed mineral oil based products could be present in soil and groundwater at the leak location. Due to its high biodegradability, lower volatility and low solubility, it is considered that LABs are of less concern for adverse environmental impact than mineral oil based products. Given that there is potential for a mixture of both types of cable fluids to have been used at this site, potential contaminants of concern have been identified. A summary of the source audit findings is as follows:

Table 16. Area of Potential Environmental Concern

Number	APEC	Potential Contaminants of Concern	Potential Media Impacted
1	Leak at (18) Francis Street – Inchicore 110 kV (May 2011 – November 2014)	LABs TPH BTEX VOCs SVOCs	Soil Groundwater Soil Vapour Ground Gas

Surface water and sediment sampling undertaken on the drain adjacent to the site and the Grand Canal. The drain runs from west to east along the northern site boundary paralleling the Grand Canal (water in the drain appeared stagnant and heavy weed growth/items of rubbish were observed). The analysis has indicated the presence of LAB within the drain surface water and sediment and, to a lesser extent, in sediment at where the drain discharges to the Grand Canal. However, concentrations of hydrocarbons have been below the detection limit in all surface water samples collected from the Grand Canal in each of the four rounds of monitoring. This indicates there is no significant impact to surface water within the canal. No mineral oil was detected during sampling.

The preliminary CSM developed for the site looked at potential source-pathway-receptor linkages identified during the assessment works and identified a moderate potential risk to the following receptors:

- Industrial/commercial and residential receptors due to the potential for ground gas generation resulting from degradation of NAPL (if present in soil and groundwater around the leak location); and
- Perched groundwater due to potential impact to groundwater chemistry from the presence of NAPL and associated biodegradation products around the leak location.

A low to moderate risk was identified to receptors from the potential for vapour migration from mineral oil based cable fluid (if present in soil and groundwater around the leak location) and from the migration of NAPL and potential breakdown products along preferential flow pathways such as existing underground services.

Potential impact to the bedrock aquifer from contaminants around the leak location was considered to be low to moderate due to the geology beneath the site.

Risks associated with other potential source-pathway-receptor linkages were considered to be low.

The PSA is preliminary in nature as it was based on an evaluation of qualitative data sources and surface water and limited sediment sampling (i.e. not on intrusive site investigation works), meaning that identification of potential risk does not necessarily indicate a risk to a receptor, rather that further assessment may be required.

Given that potential risks were identified in the PSA, it is considered that intrusive site assessment is required to further assess assumptions made in the preliminary CSM and potential source-pathway-receptor (SPR) linkages. The findings of the PSA should form the basis of the scope of work for further detailed site assessment (DSA), and it is recommended that an iterative approach be adopted for intrusive assessment works. Given that the leak location has been confirmed, the first (exploratory) step in the DSA process would be to assess soil and groundwater conditions (as well as the presence of NAPL) through the excavation of slit trenches / trial pits in the vicinity of the leak location. A key aspect of these investigation points would be to expose the cable backfill materials to assess if they have acted as a migration pathway.

An indicative scope of work for the exploratory phase of the DSA is outlined as follows:

Table B Indicative Scope of Work – Detailed Site Assessment

Investigation Type	Indicative Number	Target Depth	Justification
Trial pit / slit trench	6	3 m bgl	Source Assessment - Assessment for the presence of contamination (including NAPL) in unsaturated and (if possible) saturated soil through collection of soil samples along the cable route, adjacent to and beyond the leak location. Assessment of the presence of impermeable geology underlying the source. If possible, temporary monitoring wells could be installed into slit trenches to allow gauging of NAPL and completion of an indicative assessment of groundwater / soil vapour / ground gas quality.
Desk based	-	-	Pathway Assessment – It is assumed that the Grand Canal adjacent to the site is lined with a low permeability material such as clay, as was commonly used in the 1700s - early 20 th Century to prevent leakage from the canal and thus loss of water level restricting navigation. Further desk based assessment to confirmed construction of Grand Canal.

An outline schedule of laboratory analysis is provided as follows:

Table C Preliminary Laboratory Schedule – Detailed Site Assessment – Exploratory Phase

Parameter	Number of Soil Samples	Number of Soil Leachate Samples	Number of Groundwater Samples
TPH Criteria Working Group Analysis	12	6	2
Extractable Petroleum Hydrocarbons	12	6	2
BTEX Compounds	12	6	2
VOCs & SVOCs	6	6	2
Whole Oil Analysis	-	-	1 (if present)

Once the exploratory phase of the DSA is completed, recommendations can be made for further site investigation works required to assess potential SPR linkages identified as part of the PSA.

Yours sincerely,

██████████
Technical Director
AECOM Ireland Limited
T: +353 (0)1 238 3100
E: ██████████@aecom.com