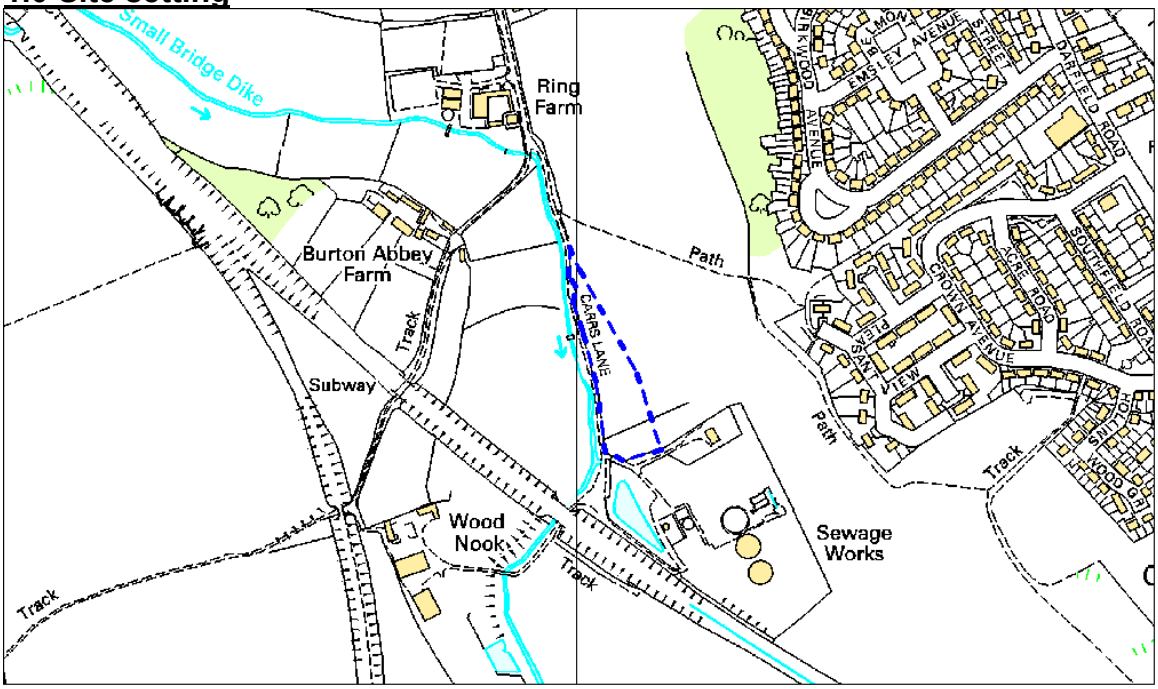
P2-424-i24 Phase I

Landfill 42, Nr Cudworth

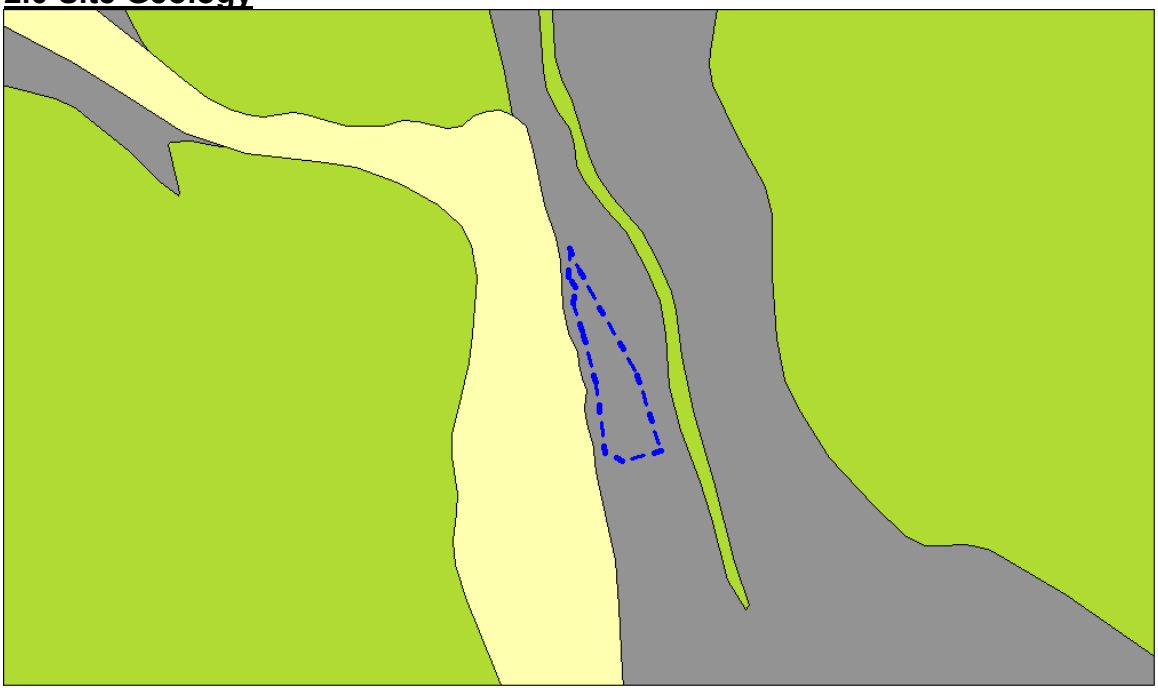
Active Layer: Landfill 42

1.0 Site setting



The site occupies an area of open, possibly agricultural, land near the village of Cudworth. To the south is a small sewage works, beyond which is a dismantled railway line which runs away to the southeast and northwest. Small Bridge Dike runs along the western boundary of the site and to the west is more open ground, beyond which is a significant area of residential development. To the north are further agricultural land and a farmhouse with associated buildings. Another farm lies to the northwest of the site

2.0 Site Geology



This area lies upon the Middle Coal Measures formation (MCM) which dominates much of the underlying geology in this part of the Borough. The site itself lies upon a band of undivided Cyclic Sedimentary Rock, i.e. mudstone and shale (indicated in grey). To the east is a very thin intrusion of MCM Sandstone (indicated in green), with a much larger band of the same rock to the west of the site. Further to the east is an extensive band of Mexborough Sandstone (also indicated in green). Overlaying the sandstone to the west are alluvial deposits (indicated in yellow) associated with Small Bridge Dike

3.0 Surface hydrology

There are no surface hydrology features on the site itself. The nearest surface water feature is Small Bridge Dike which flows directly adjacent to the western edge of the site.

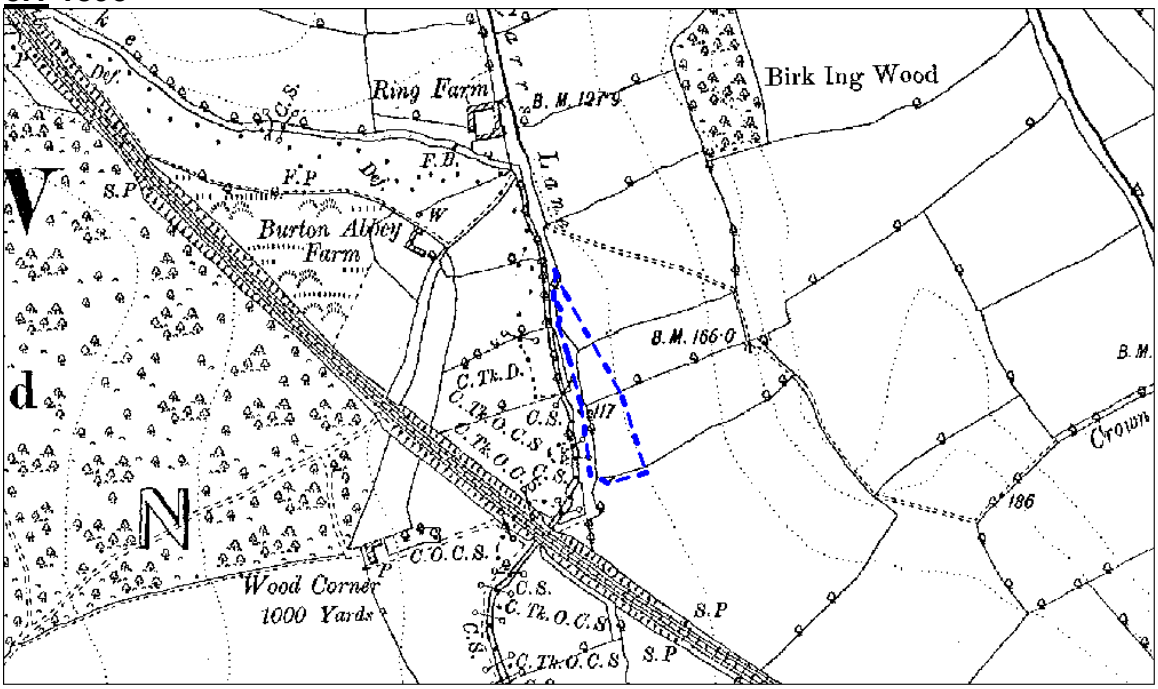
4.0 Site Hydrogeology

WATER ENVIRONMENT		GROUNDWATER SENSITIVITY[1]		
		NON AQUIFER	MINOR AQUIFER	MAJOR AQUIFER
DISTANCE TO NEAREST SURFACE WATER[2]	>200m	Low Risk	Low Risk	Medium Risk
	50 – 200m	Low Risk	Medium Risk	High Risk
	<50m	Medium Risk	High Risk	High Risk

The site lies upon a minor aquifer of high vulnerability. This means that while there is a significant risk of contaminants migrating to the stored groundwater, the aquifer is of little hydrological value outside of the immediate area. This, combined with the very short distance to the nearest surface water feature, means that the overall risk to the water environment from potential contamination at this site can be regarded as High.

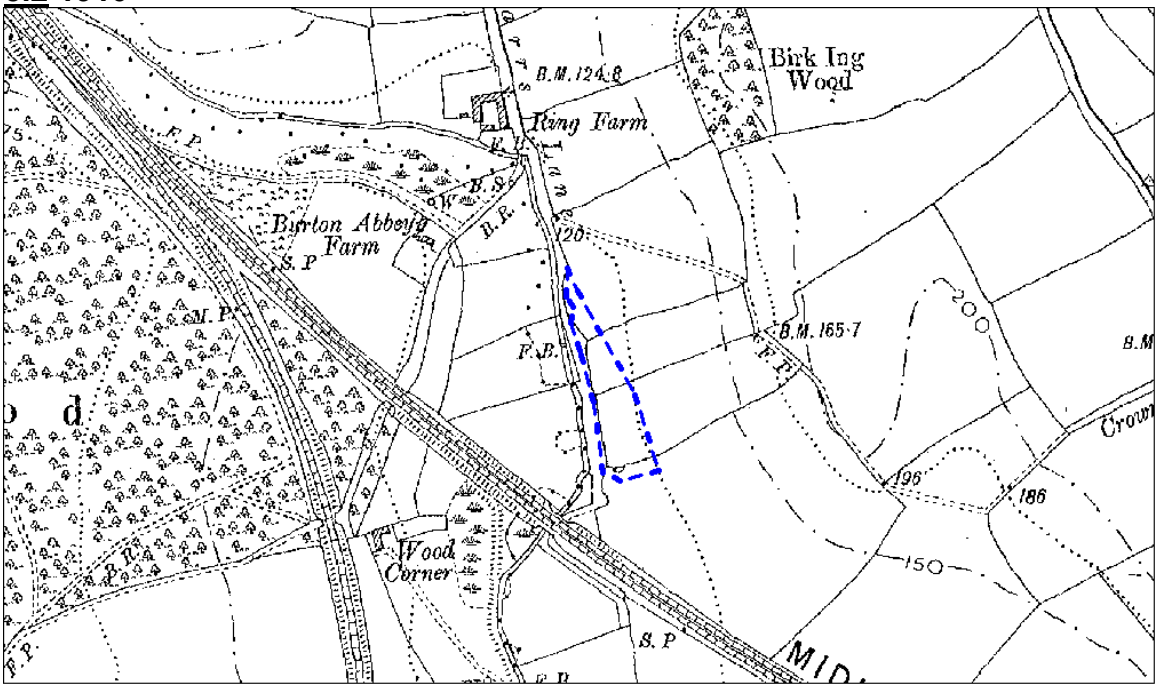
5.0 Site History

5.1 1895



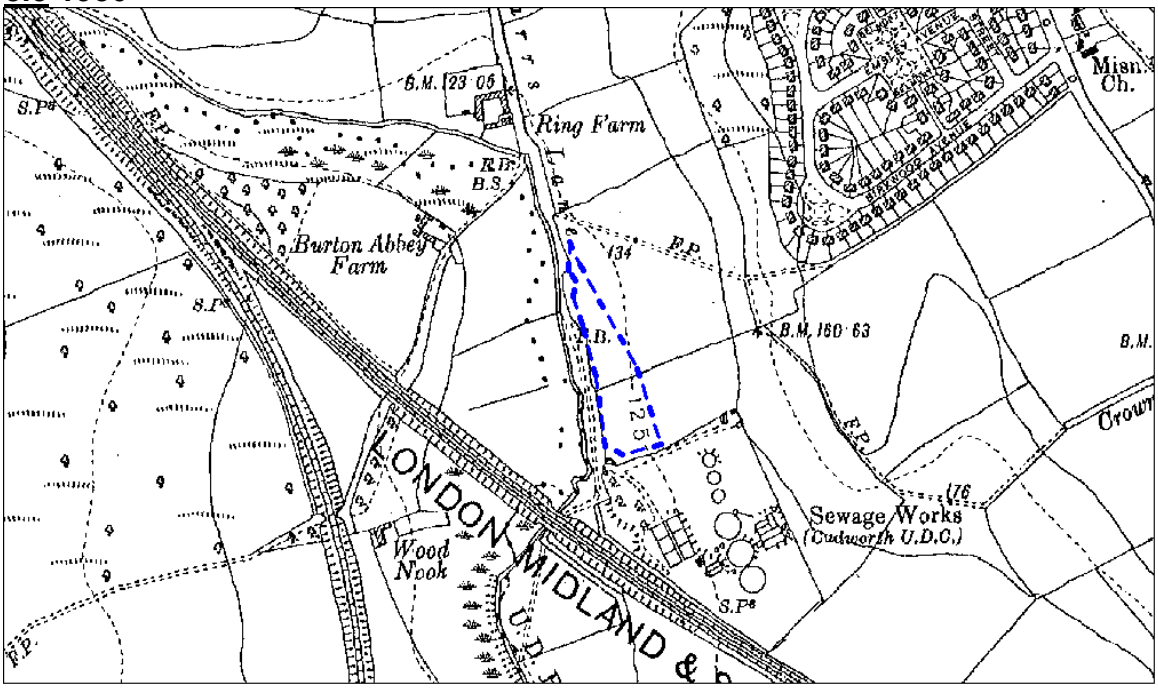
The site occupies an area of agricultural land adjacent to a small river. Further agricultural land lies to the east, south and north, with the River on the western boundary of the site. There is a railway line further to the south and west, beyond which is a large woodland

5.2 1910



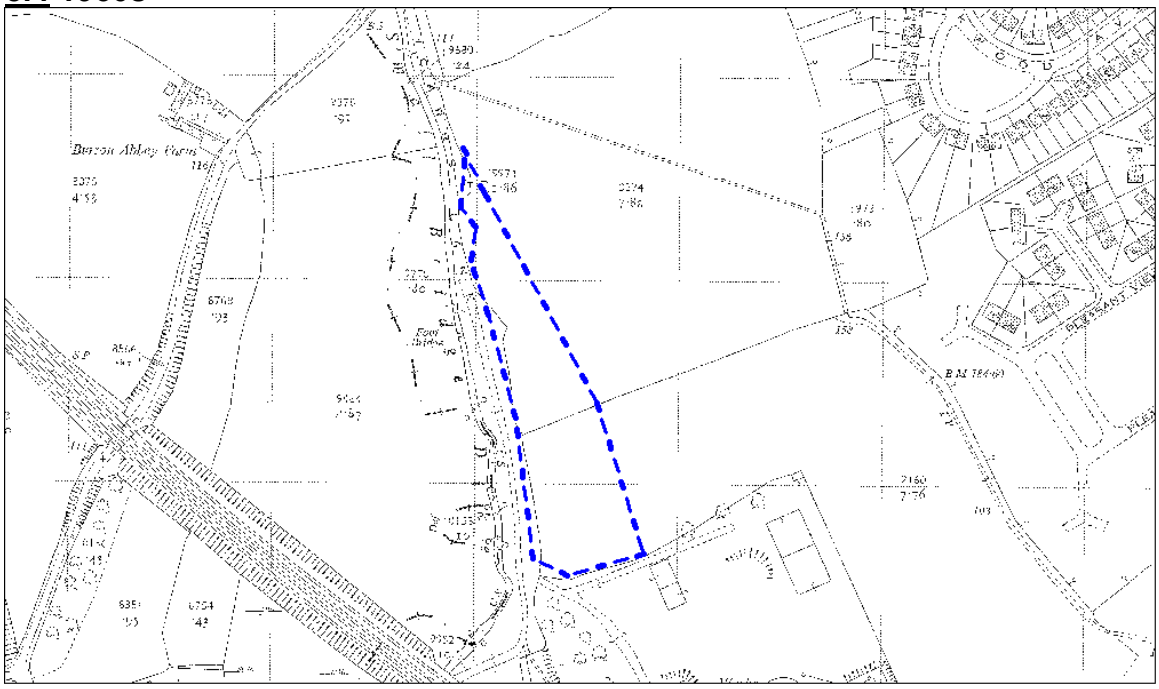
Little change

5.3 1930



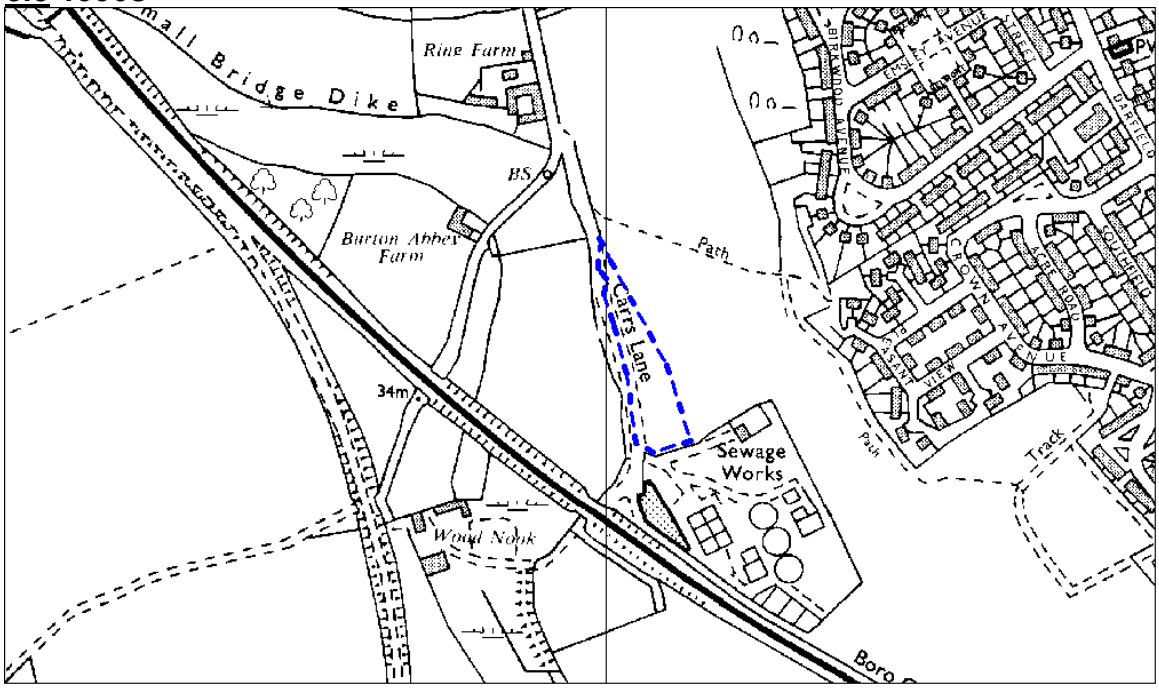
There is now a sewage works just to the south of the site and a housing development has been built several hundred metres to the east, but the site itself remains much the same

5.4 1960s



Little change

5.5 1990s



Little change

Summary

The site appears to have had no discernable potentially contaminative use until the landfill which took domestic waste and was closed circa 1981. The licence was issued in November 1970, but it is unlikely that the site was active for 11 years. The only directly adjacent process which may provide a source of contamination are the sewage works and there is a less significant possibility of contaminants migrating from the railway line to the site.

6.0 Conceptual Model

Sources

The most significant source of contamination associated with domestic landfills tends to be the generation of methane and carbon dioxide from the decay of buried organic material. This buried organic material may also produce leachates as they decay, facilitating the movement of other contaminants around the adjacent areas. These leachates may contain metals found within the domestic waste such as iron, aluminium, nickel and tin. The sewage farm to the south of the site may also provide additional sources of CH_4 and CO_2.

Pathways

The pathways that must be considered for this site include ingestion, inhalation, dermal contact, asphyxiation, explosion and direct contact. There may be a period of migration prior to the pathway becoming active

Receptors
The receptors that must be considered for this site include site users, adjacent site users, adjacent site residents and controlled waters

Linkages

Source	Receptor	Pathway	Risk	Comments
CH4 & CO2 from the decay of buried organic material	Site users, Adjacent site users, Adjacent site residents	Inhalation, Asphyxiation, Explosion	**LOW**	While this site has in the past been recorded as 'gassing', it is highly unlikely that any linkage can be demonstrated due to the lack of a viable receptor. There are no on site receptors apparent and given the distance and the underlying geology it is highly unlikely that gas could transmit to adjacent residential property
Organic leachates containing metals	Site users, Adjacent site users, Adjacent site residents, Controlled waters	Ingestion, Dermal contact, Direct contact	**LOW**	No evidence to support the presence of such leachates exists to BMBC and the risk to site and adjacent site users would be minimal in any case. There is no GQA evidence to suggest pollution of controlled waters and any effects from this site on the adjacent dike would be negligible

7.0 Conclusion

Part IIA of the Environment Act 1990 defines contaminated land as being;

"any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that-

(a) significant harm is being caused or there is a significant possibility of such harm being caused; or
(b) pollution of controlled waters is being, or is likely to be, caused"

It is unlikely, given the current land use and ground cover, that this statement could be applied to this site. While there is prior evidence of this site producing significant levels of landfill gas, the absence of a viable receptor on the site and the distance to more vulnerable receptors off the site means that no significant

linkage could be proven. However, the site shall be visited in order to assess any risk to controlled waters.