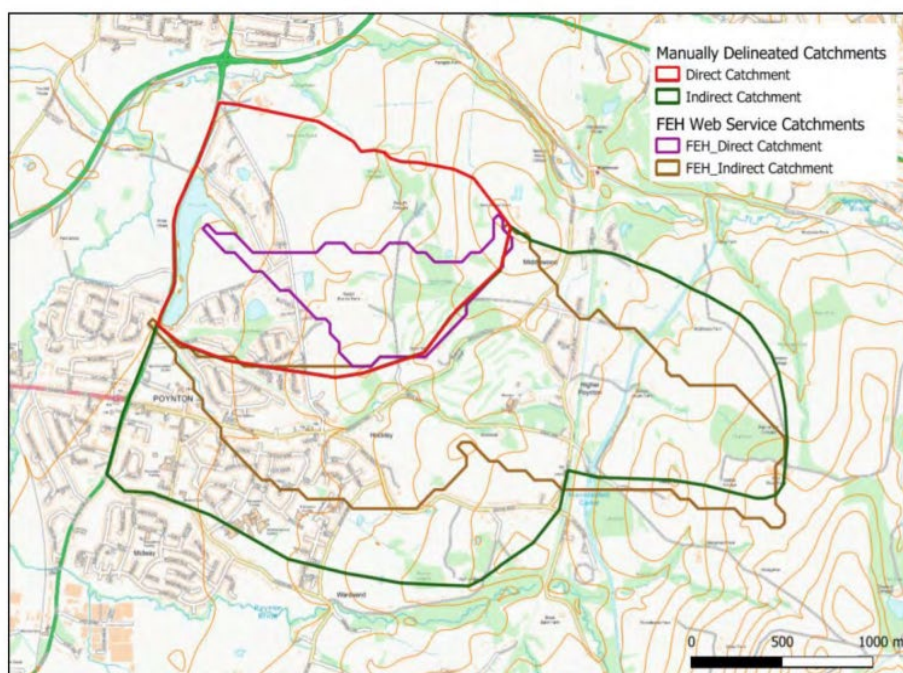


Please can you provide me with a list of what information (relevant to the planning application) you consider to be inaccurate or requires updating, together with evidence to demonstrate why you believe this to be the case?

- Volume of Water –Paragraph 1.2 of the Summary Options Report states that the reservoir stores a volume of approximately 130,000m³. However, the Environment Agency and Cheshire East concede that the actual volume of the reservoir is unknown. Friends of Poynton Pool have carried out a basic survey of the pool which appears to indicate that the volume of the pool is significantly less than the current recorded volume of 130,000m³. At a meeting on the 13th November the Environment Agency agreed to undertake a bathometric survey of the reservoir.
- Level of the embankment clay core is unknown – The Flood Study Report (D01 C01) states “the level of the embankment clay core is unknown. It is recommended that this should be established along with other geotechnical properties of the embankment, in order to quantify the risk of seepage through the dam”. Understanding the properties of the dam is key to assessing potential modes of failure for the dam. This work has not been undertaken by Cheshire East Council despite the recommendation in the Flood Study Report.
- Catchment redrawn by the Flood Study, impact of coal mines on catchment behaviour - The Flood Study Report redrew the catchment. The catchment given in The Centre for Ecology and Hydrology Flood Estimation Handbook catchment is about half the size confirms that “Poynton Pool Reservoir is a small ungauged catchment.

Figure 4-3: Poynton Lake Reservoir Manually Delineated and FEH Catchment Boundaries



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Flow estimates from small ungauged catchments are open to greater uncertainty than for larger gauged catchments. ... Historic flooding information could give verification data for the model” Residents have been informed that no data is available for Poynton Pool. The Town Council is concerned about the way the catchment has been redrawn and also believes that the catchment may be impacted by the historic coal mines and underground workings which lie directly to the east of Poynton Pool. The assertions in the reports that the dam will overtop in a 5% AEP rain event is not supported by local knowledge. The Town Council would ask that the catchment area (rainfall, inflows and outflows) is investigated further so that the catchment area is better understood and accords with local knowledge about flooding at the Pool.

- Detailed Topographical Survey - Paragraph 2.2.2 of the Planning Statement (BRJ10627-JAC-XX-XX-RP-PL-0002) and paragraph 2.2 of the Environmental Assessment Report (BRJ10627-JAC-XX-XX-RP-EN-0011 P01) appear to contradict figures given in other supporting document as it states that “A low crest marker (kerb) will be also be added to ensure a consistent level. The resultant freeboard, after these works would then be 90.3mOD-89.63mOD=.67m i.e a maximum increase of 0.3m (for the low points)”. However, the Flood Risk Assessment (BRJ10627-JAC-XX-XX-AS-HY-0100) (paragraph 4.4) states “The lowest point of the dam is currently 90.86 mAOD and the regulated height after the works will be 91.3 mAOD”. This would include increasing the height of the lowest sections by 0.44m.

The Spillway Upgrade: Further Investigation of Option 3C Report has the following topographical information

The key parameters for the dam and the reservoir it retains are summarised below.

Feature	Units	Dimensions as shown on		Source/Comment
		2016 S10	2019 Survey	
Reservoir Capacity	m ³	130,000	N/A	2016 S10
Reservoir Area at TWL	m ²	68,000	N/A	2016 S10
Embankment Crest	m (AOD)	90.92	91.24 (Typical) 90.93 (Lowest)	As shown on the 2019 Topo Survey, See Note 1.
Spillway Weir Crest	m (AOD)		90.55	
Lowest Level on A Road	m (AOD)	N/A	89.31	
Downstream Toe	m (AOD)		84.3	
Design Flood Category	B			
EA Risk Designation	High Risk			
Notes				
1.	Site inspection on 19th June 2021 noted that from around Ch 450 to 800 ground level in undergrowth downstream appeared to be around 200-300mm higher than levels on footpath.			

As the topographic survey is missing from the Spillway Upgrade Initial Options Report, it isn't possible to confirm which of these varying figures are incorrect. The correct figures should be established and confirmed.

- Risk of overtopping - Throughout the reports lodged in support of the planning application, various figures have been provided for overtopping. Section 1.1 of the Planning Statement states that the dam risk of overflow in flood event in excess of 1

in 50 chance per year. This is in line with the information provided in the Flood Study (see table below), although does not accord with local knowledge or the historical record that no incidents of flooding of the pool are known.

Table 6.4: Critical storm durations for T-Year, including drainage network bypassing of the reservoir.

Event (year)	Peak stillwater flood level (mAOD)	Reservoir Inflow (m ³ /s)	Reservoir Inflow Volume (m ³)	Peak culvert outflow (m ³ /s)	Peak dam crest overflow (m ³ /s)	Length of crest overtopped (m)	Linear overtopping (l/s/m)
1% AEP (100-year return period)	91.981	3.79	41,300	0.80	0.71	68	10
2% AEP (50-year return period)	90.856	2.61	27,400	0.74	0.00	0	0

Note: Minimum embankment crest level = 90.88mAOD

However, paragraph 4.3.3 the same report states 2 “As a result of the proposed development, the reservoir will be expected to overflow the western dam during the 0.1% AEP compared to the 5% AEP under the current scenario.” 5% AEP is a 1 in 20 chance per year. This is echoed by the other documents lodged with the planning application, including the Summary Options Report and Flood Risk Assessment.

The Poynton FRA Model Report references the Flood Study and states “the assessment indicated that the existing historic reservoir does not satisfy the current safety design requirements, with the existing weir crest expected to experience significant overtopping from the 3.33% (AEP 1:30) year event”. However, these figures do not accord with table 6.4 above which is taken from the Flood Study 2019. The Flood Study states the 2% AEP (50 year) event has modelled still water that is just 24mm **below** (our emphasis) the lowest point on the dam crest...overflow events of greater magnitude will cause overtopping of the dam.”

We can find no reference in the published Flood Study Report October 2023 to the dam having significant overtopping from a 3.33% (AEP 1:30) year event. It should also be noted that the baseline figures shown in table 5.1 of the Poynton FRA Model Report vary from the original figures provided in the study, no explanation has been given regarding the variance.

Historically there is no evidence showing that Poynton Pool has flooded in its 270+ year existence even during known local flood events (further information can be provided on the magnitude of these events and where flooding occurred in neighbouring areas if required by the Planning Authority). Despite numerous floods of greater magnitude of 1 in 50 years. Why hasn't it flooded as predicted by the applicant. We believe that this is an indicator of significant data errors within the flood study and this should be investigated.

- A member of the Strategic Planning Board asked the applicant to quantify the risk of the dam failing.

Likelihood of dam failure– This is not set out in any of the documents. Information should be provided as to the current likelihood of the dam failing and what the reduction in that risk would be once the works are completed. The Executive Summary of the Summary Options Report states that “improvements are therefore needed to the dam to reduce the likelihood of it failing in an extreme weather event” but this is not quantified within the documentation.

Impact of dam failure – The Summary Options Report states that “in the event of failure of the dam and release of the reservoir around 3,500 people would be present in the area at risk of injury and death...and on average around two people would be killed”. However, this statement fails to make it clear that these figures are for dam failure on a wet day event. Jacobs initial options report BRJ10627 – J470-DOC-001/004 notes that the “the other important factor in evaluation of the potential impact of dam failure on a wet (relevant to spillway capacity) is the flood would be happening anyway even with no dam failure”.

It should be noted that the report in table 4.4 from the Initial Options Report (see below) shows that the failure of the dam alone (dry day) would result in an estimated 274 people in the population being impacted and likely loss of life is 0.12. The text included in the table confirms that the Environment Agency do not use the figure of an average of two people being killed which has been quoted widely through the lodged planning documents.

For the purposes of the economics ALARP assessment, the base case likely incremental loss of life provided by the Environment Agency, is adopted as 1.04. In practice in the event of dam failure the public downstream are likely to assign the overall impact of 1.97 lives as being the responsibility of the Undertaker. (Cheshire East council)

Table 4.4 Screening estimate of risk to life (wet day)

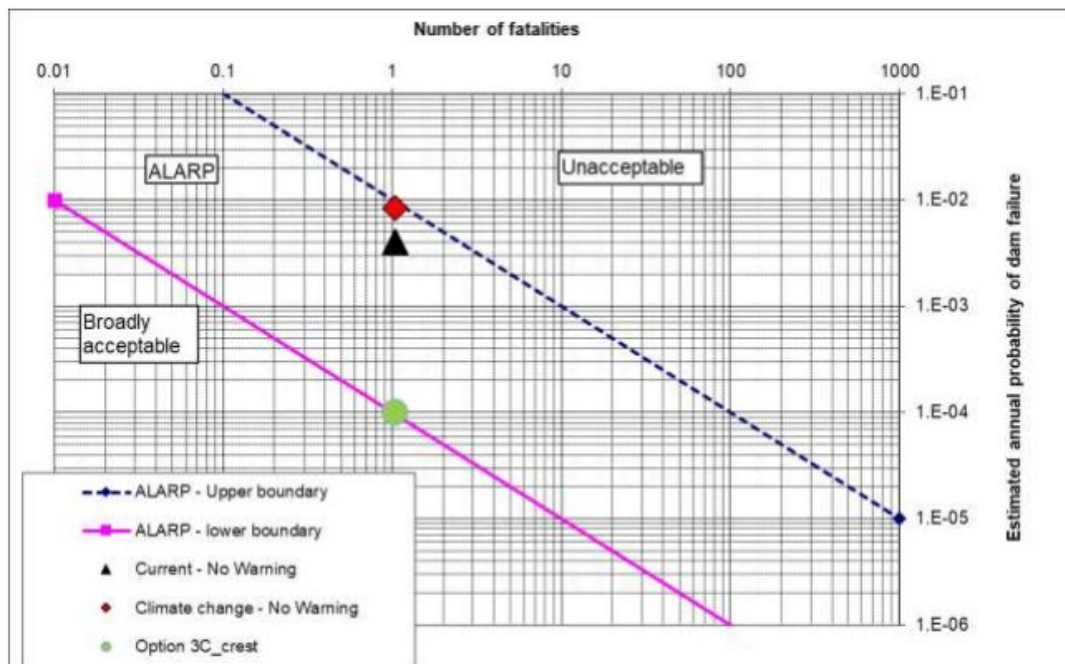
Source	Scenario	Number of houses at risk (Note 1)	Maximum/ Time averaged population at risk	Likely loss of life		Property damage £M	Source comment
				No warning	with warning		
Environment Agency 2016 dambreak	Dry day		274/ 184	0.12		6	
	Wet day		3538/ 2246	1.97		79	
	Incremental wet day		2031/ 1306	1.04		45	

The impact of dam failure is therefore inaccurate and should be amended.

Section 1.4 and 1.5 of the Summary Options Report states that the risk of loss of life and property damage to those living downstream is unacceptably high. However, the Jacobs Initial Options report had to be amended following the discovery by Friends of Poynton Pool of a significant error showed that the risk was not in the

unacceptable zone but actually in the As Low as Reasonably Practicable (ALARP) region. Please see below

Figure 4-3 FN Frequency-Consequence Chart plot of societal risk



In addition, Section 4.3.2 of the Planning Statement states in relation to Flood Risk that “the residual risk from breach failure is significantly reduced by the proposed works”. However, the Flood Risk Assessment lodged with the application states at page 21 that “The residual risk of dam failure/breaching is considered to remain negligible”. No figures are provided either in the Planning Statement or in the Flood Risk Assessment in relation to the current or residual risk of dam failure/breaching.

- A member of the Strategic Planning Board also queried the risk to life and the proportionality of the work, the attached report from Professor David Ball will assist with this enquiry.
- Extent of flooding – The applicant has use EA Reservoir flood maps, these flood maps primary purpose is for screening, to delineate the absolute maximum potential flood extent in a worst-case scenario. The mapping makes no attempt to assess the likelihood or risk of that consequence occurring. The applicant had undertaken a RARS Tier 2 Screening Breach and Consequences Assessment but this was not shared with the Strategic Planning Board. There are further uncertainties around the extent of the flooding as it would appear that the EA use a volume of 176,000m³ for the pool when mapping the flooding extent. At present the volume of the pool is unknown but likely to be significantly less than this even during full flood.
- Consequences of removing the trees and subsequent reduction in the density of the embankment on the structural integrity of the dam.

The planning statement asserts that “The existing trees along the dam embankment also pose dam resilience safety concerns, as tree roots can damage the

embankment dam structure retaining the reservoir and increases the likelihood of structural failure of the dam, which therefore increase the risk of flooding downstream due to dam failure”.

However, in correspondence between Friends of Poynton Pool and the Editor of ‘Dams and Reservoirs’ at the British Dam Society responded to Friends of Poynton Pool enquiries as follows:

*“The Reservoirs Act 1975, including clauses modified or added by the Flood and Water Management Act 2010, **makes no mention of grass or trees, or indeed any other physical condition of a dam.***

It puts the onus for safety on a qualified civil engineer (the Inspecting Engineer) to identify any aspects that could put the dam or reservoir at risk. The Inspecting Engineer must then issue a report in which ‘Matters in the Interests of Safety’ are stated, which the undertaker (responsible for the safety of the reservoir) is then legally required to carry out.

The publication by the Institution of Civil Engineers that I believe you are referring to is Floods and Reservoir Safety – 4th Edition. Note that this is not a legal document – it simply gives guidance to reservoir engineers.

This document does indicate that trees on the downstream face of dam can cause changes in the flow pattern if the dam overtops, causing turbulence and erosion, but that is simply a reminder to reservoir engineers to consider the potential effects

It certainly does not say that trees must be removed or that the only growth accepted is grass.

The many dams with trees growing on their embankments are typically at privately-owned reservoirs on estates, and I am not at liberty to release the names of these.

*However, **during my 30 years as a Supervising Engineer** I was appointed to a number of these, all of which were subject to Inspecting Engineers’ reports at least once every ten years.*

*As these were often by different Inspecting Engineers from year-to-year quite a number of engineers saw these trees, **but not one of them** felt that – on these particular dams – they posed a risk to the dam’s safety.”*

This is echoed in the Section 10 2016 inspection report for Poynton Pool which states on page 8 “A further potential problem is the presence of many mature trees that exist on the dam. It is not an ideal situation to have large trees on a water retaining embankment. However, given that this is a small dam and that the trees have been in existence for many years, it is **acceptable** (our emphasis) provided that the trees are managed in a proper manner.”

The Section 2005 inspection report also states “The upper part of the upstream face is not protected from erosion in a formal manner but tree roots do help to prevent

erosion of the fill material” and further “The extensive tree roots are mostly preventing erosion of the bank and where erosion is occurring it is in the open areas.

In addition, the Annual Supervising Engineers Reports in 2019, 2021 and 2022 states “Fortunately, the crest is very wide and there does not appear to be a risk of the entire crest width being damaged by a fallen tree along the upstream face” this statement casts doubt on the assertion that the trees increase the likelihood of structural failure”.

We are extremely concerned about the impact of removing significant numbers of trees on the structural integrity of the dam embankment, the structure and composition of which is unknown. We would ask that a detailed report on the impact of tree removal on the dam embankment is undertaken.