Capital Delivery Alliance
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# IED CIRIA 736 Risk Assessment Summary

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## Queensferry Risk Assessment Summary

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| File Ref | B14411-123532-ZZ-XX-AS-ZA-CI1015 | Version | P01 |
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| Zone | Document ref. | Asset information | Existing mitigation | Risk Summary and Zonal Containment Recommendation | Proposed Site Solution |
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| 1 | B14411-123532-ZZ-XX-AS-ZA-CI1002 - Queensferry CIRIA 736 Risk Assessment - Zone 1 (imported sludge) | Sludge import area Underground tank (1981) - volume of tank 164m$^3$ | Shut off valve | The probability and risk of failure from the tanks is very low. In line with CIRIA 736, wider containment needs to be provided to protect receptors if a credible (partial) failure of the tanker volume occurred. This has been calculated as a minimum of 3m$^3$ (10% of tanker volume) of secondary containment required to accommodate sludge lost from significant corrosion/pipework connection leak or oprator error. 33m$^3$ would be required if catastrophic failure occurred. | Based on topography, propopsed solution to accomodate catastrophic failure with a containment volume 25% of all tanks within the area.<br><br>All permeable stone areas within the proposed bunded area to be made impermeable<br><br>Concrete deflector wall around the digesters to deflect any loss of containment into the site and bunded area and away from the adjoining site.<br><br>Vehicular barriers to be provided for all tanks adjacent to access road where potential impact can occcur, especially GFS tanks.<br><br>Proposed bund to contain 25% of total tank volume of all the zones (1740m$^3$) which is defined by kerbs, road humps and concrete walls. Existing humus tanks to be bunded to ensure primary process is not affected when loss of containment occurs.<br><br>Refer to Drawing B14411-123532-XX-XX-DR-CA-CI9000-P01 for further details.<br><br>The site maintenance strategy and annual plant shutdown should include annual structural assessments of the containment structures, including the condition of the surrounding hardstanding areas. Drainage pipework (CCTV) and above ground process pipework should be inspected by a competent engineer to allow for pro-active maintenance. |
| 2 | B14411-123532-ZZ-XX-AS-ZA-CI1003 - Queensferry CIRIA 736 Risk Assessment - Zone 2 (consolidation tanks) | Consolidation tanks Concrete partially above ground tank (1981) - volume of each tank 243m$^3$ | High level overflows | The probability and risk of failure from the tanks is very low. In line with CIRIA 736, the paved areas should be replaced with impermeable hardstanding and wider containment needs to be provided to protect receptors if a credible (partial) failure of the above ground volume occurred. This has been calculated as a minimum of 82.5m$^3$ (total above ground volume) of secondary containment required to accommodate sludge lost due to a significant structural damage/pipework connection leak. | |
| 3 | B14411-123532-ZZ-XX-AS-ZA-CI1004 - Queensferry CIRIA 736 Risk Assessment - Zone 3 (digesters) | Digesters Concrete above ground tanks (1980) - volume of each tank 1705m$^3$ | Existing impermeable hardstanding (partial), high level overflows | The probability and risk of failure from the tanks is very low. In line with CIRIA 736, the stone areas should be replaced with impermeable hardstanding and wider containment needs to be provided to protect receptors if a credible (partial) failure of the digester occurred. This has been calculated as a minimum of 265m$^3$ of secondary containment required to accommodate sludge lost due to a significant crack/pipework connection leak 1420m$^3$ would be required if catastrophic failure occurred. | |
| 4 | B14411-123532-ZZ-XX-AS-ZA-CI1005 - Queensferry CIRIA 736 Risk Assessment - Zone 4 (Digested sludge holding tank) | Digested sludge holding tanks GFS above ground tanks (1981/2002) - each tank volume 468m$^3$ | None | The probability and risk of failure from the tanks is very low. In line with CIRIA 736, the grassed areas should be replaced with impermeable hardstanding and containment needs to be provided if the digested sludge holding tank had significant corrosion or seal failure leading to a partial loss of containment (equating to a minimum 133m$^3$ of required secondary containment). 468m$^3$ would be required if catastrophic failure occurred. | |
| 5 | B14411-123532-ZZ-XX-AS-ZA-CI1006 - Queensferry CIRIA 736 Risk Assessment - Zone 5 (Digested sludge holding tank) | Digested sludge holding tanks Concrete above ground tanks (1980) - volume between 1720 and 1806m$^3$ | None | The probability and risk of failure from the tanks is very low. In line with CIRIA 736, the grassed areas should be replaced with impermeable hardstanding and containment needs to be provided if the digested sludge holding tank overflowed or had significant leaks leading to a partial loss of containment (equating to a minimum 201m$^3$ of required secondary containment). 1442m$^3$ would be required if catastrophic failure occurred. | |
| 6 | B14411-123532-ZZ-XX-AS-ZA-CI1007 - Queensferry CIRIA 736 Risk Assessment - Zone 6 (Digested sludge holding tank) | Digested sludge holding tanks Concrete above ground tanks (1981) - each tank volume 98m$^3$ | Existing impermeable hardstanding (partial) | The probability and risk of failure from the tanks is very low. In line with CIRIA 736, the grassed areas should be replaced with impermeable hardstanding and containment needs to be provided if the digested sludge holding tank overflowed or had significant leaks leading to a partial loss of containment (equating to a minimum 28m$^3$ of required secondary containment per lane). | |
| 7 | B14411-123532-ZZ-XX-AS-ZA-CI1008 - Queensferry CIRIA 736 Risk Assessment - Zone 7 (Centrifuge feed tank) | Centrifuge feed tank GFS above ground tank (2002) - each tank volume 159m$^3$ | Existing impermeable hardstanding (partial), high level overflow | The probability and risk of failure from the tank is very low. In line with CIRIA 736, the grassed areas should be replaced with impermeable hardstanding and containment needs to be provided if the centrifuge feed tank had significant corrosion or seal failure leading to a partial loss of containment (equating to a minimum 35m$^3$ of required secondary containment). 142m$^3$ would be required if catastrophic failure occurred. | |
| 8 | B14411-123532-ZZ-XX-AS-ZA-CI1009 - Queensferry CIRIA 736 Risk Assessment - Zone 8 (cake bays) | Cake bays | Existing impermeable hardstanding | The probability and risk of failure from the cake bays is very low and any associated loss of inventory volume (sludge cake with low viscosity) would be contained within the hardstanding area. As per CIRIA 736, as the existing surface water drainage is blocked, new gullies and associated drainage is proposed to mitigate any transport potential downstream. | |