Current Inventory of COMAH Dangerous Substances Present at STSC

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
COMAH DANGEROUS SUBSTANCES								
SCHEDULE 1, PART 2 - NAMED DANGEROUS SUBSTANCES								
34. Petroleum products and alternative fuels including:								
(c) gas oils (including diesel fuels, home heating oils and gas oil blending streams)	SBCO	Benzole fire pumps No.1	0.25		**2,500**	**25,000**	**BELOW LOWER TIER** The aggregate Petroleum Products inventory is below the lower-tier threshold. The bulk of this inventory is made up of HFO in seperate tanks which will require specialist removal due to being in tank heels etc. or solidifcation due to lack of heating. Diesel continues to be used in limited locations on the site.	Demolished.
		Benzole fire pumps No.2	0.25					Demolished.
		Wagon Shop Diesel Tank		0.00				Demolished.
		Coal Oiling Tank (PFO)		0.00				Demolished.
	RCO	1P120	Not known in 2015	0.67				L = 1.25, B= 0.625. Calculate A) the maximum volume in the diesel tank as this varies with 1P120 pump use.
		2P120	Not known in 2015	0.67				L= 1.25, B= 0.625Calculate A) the maximum volume in the diesel tank as this varies with 1P120 pump use. (NOTE 2 - 2P120 diesel tank is now used for 1P120 operations in conjunction with 1P120 as required)
		OP426	Not known in 2015	0.59				OP426 diesel tank. Calc A) max fill volume of diesel in the tank where, l=1.215m, b=0.91m, and h=0.60m. Site measured
		OP428	Not known in 2015	0.01				OP428 diesel tank. Calc A) vol of diesel in the tankein the tank where, l=0.76m, b=0.43m, and disel h =0.025m. (INFO ONLY- tank depth is 0.43m). Site measured
		PUSHER 1	Not known in 2015	0.00				The diesel tank has been dipped and is empty but will still require cleaning for removal Demolished.
		PUSHER 2	Not known in 2015	0.00				The diesel tank has been dipped and is empty but will still require cleaning for removal Demolished.
		PUSHER 3	Not known in 2015	0.00				The diesel tank has been dipped and is empty but will still require cleaning for removal Demolished.
		Main Coal Oil Tank		0.00				Demolished.
		Spare Coal Oil Tank		0.00				Demolished.
	Power & Energy	PS2A Emergency diesel generator	31	0.00				PS2A is not in service and empty - PS2B is in use and holds between 5000 and 30000 Litres depending on what time of year (TRIADS).
		PS2B Emergency diesel generator	31	30.00				
		RPS service tank	Not known in 2015	7.00				
		Cleveland Oil Installation ED2 - for firing package boilers		0.00				Demolished.
		Steel House emergency generator	Not known in 2015	0.30				
	RMH	1 x storage tank. For domestic heating	10					Demolished.
		1 x storage tank. For refuelling of equipment.	6					Demolished.
		TUFFA tank		0.00				Demolished.
	RBF	RBF 1/4 emergency water diesel tank	9	0.00				Inventory used onsite during demolition.
		RBF 1/2 emergency generator tank	2	0.00				Demolished.
		RBF 1/1 shell spray diesel tank	1	0.00				Demolished.
		RBF 1/5 GCP emergency diesel tank	1	0.00				Confirmed empty during demolition.
	Steelmaking	BOS 26 - East side of services offices	4	0.00				Demolished.
		2 x 500l tanks in cable tunnel fire pumphouse	1	0.00				Demolished.
		CC5 - WTP North of control room	43.5	0.00				Drained down, inventory removed
		Diesel drums in Alloy Store		0.00				Removed
	Total Gas Oil/Diesel		**300**	**39.25**				

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
(d) Heavy Fuel Oils	Power & Energy	Distribution Pipework from COI to Redcar site.	184	76.00				August 2021: approx. 15.6% of HFO line cleaned. 06/09/2022 - approx. 37.65% of HFO line cleaned. Drawdown of HFO from RCOV6A to Butterfly World in progress. 18/10/2022 - approx. 76T estimated to be present. Decontamination on hold pending review of work method. 31/03/2023 - approx. 50 IBCs in ASUK storage area; HFO/water mix.
		Fuel Services Area Tank 2	5000	0.00				29/04/2022 - 231.07T removed. 10/06/2022 - 461.44T removed in total. 20/10/2022 - demolished. All Phase 1 Erith wastes removed from site.
		Fuel Services Area Tank 3	5000	0.00				07/04/2022 - 217.32T removed. 18/10/2022 - demolished.
		Fuel Services Area Tank 4	5000	0.00				28/02/2022 - 17T removed from site as trial load. 07/04/2022 - 219.79T removed in total. Residues remaining. 18/10/2022 - demolished.
		Fuel Services Area Tank 1	2000	residues				28/02/2022 - residues removed down to ground level. Approx. 42T removed.
		RPS HFO Storage Tank.	180	5.82				14/12/2022 - 24.18T removed from site. 31/03/2023 - 13 IBCs present; HFO/water mix.
		COI No.3 tank (STDC)		0.00				COI demolished March 2021
		COI No.1 tank (STDC)		0				COI demolished March 2021
		COI No.2 tank (STDC)		0				COI demolished March 2021
		COI No.4 tank (STDC)		0				COI demolished March 2021
	SBCO	Dalkia Boiler HFO Storage Tank.	72	0.00				Dia 1.65m x L 10m. Local gauge on cessation of operations: 5m. Assume 2mm film on shell 01/07/2022 - 24.3T removed from site 06/09/2022 - tank demolished. 4 IBCs and 6 drums containing HFO to be removed from site by Keltbray. 01/12/2022 - remaining wastes at SBCO now consist of COGM drums and arising coal tar sludge.
	Total Heavy Fuel Oils		**68,475**	**82**				
-	**Total Petroleum Products**		**68,818**	**121**				

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
SCHEDULE 1, PART 1 – CATEGORIES OF DANGEROUS SUBSTANCES								
Section 'H' – HEALTH HAZARDS								
H2 ACUTE TOXIC - Category 3, inhalation exposure route								
	SBCO	Benzole plant shift make tank North	55	0.00			**BELOW LOWER TIER** The aggregate H2 ACUTE TOXIC inventory is below the lower-tier threshold. There is no possibility that the inventory will exceed the threshold.	Dia 2.75 x L 6.10. Tank pumped to below suction level to storage tank after cessation of operations. a) Internal suction pipe 0.5 from base of tank. B) 2mm film on tank wall 18/10/2022 - demolished.
		Benzole plant shift make tank South	55					Demolished.
		Benzole Storage / Export tank	170	0.00				Dia 5m x H 9m. Tank pumped to below suction level. Manway removed & residue dipped 75mm. [Inventory removed, tank cleaned 09/2019 & transported into mobile storage tanks on site awaiting off site disposal [Decontamination project] Tank now demolished. 28/02/2022 - inventory removed from site Oct/Nov 2021 along with contents of Effluent Tank No.4.
		Primary effluent decant tank	10					Demolished.
		Secondary effluent decant tank	10					Demolished.
		Phlegm Oil / water separator	7	0.00				Dia 1.14m H 6.60m. Vessel drained & steamed out after cessation of operations drained. 2mm film on tank wall 18/10/2022 - demolished.
		Benzole / water separator	10	0.00				Dia .85m H 4.85m. Vessel drained & steamed out after cessation of operations drained. 2mm film on tank wall 18/10/2022 - demolished.
		Phlegm Oil tank	2					Demolished.
		Primary Foul Water Tank		0.00				Dia 2.74m H 3.05m. Tank was modified to a seperation vessel. Vessel drained & steamed out after cessation of operations.2mm film on tank wall 18/10/2022 - demolished.
		Secondary Foul Water Tank		0.00				Dia 2m H 6.5m. Tank pumped to below suction level to effluent storage tanks after cessation of operations. Suction pipe on bottom of tank. 2mm film on tank wall 18/10/2022 - demolished.
		Oil/Vapour Heat Exchangers (2)		0.00				Dia 0.68m x L 3.65m. X 132 x 0.038 dia tubes. Vessel drained & steamed out after cessation of operations. 2mm film on tube walls 18/10/2022 - demolished.
		Dephlegmator		0.00				Dia 0.68m x L 3.65m. X 132 x 0.038 dia tubes. Vessel drained & steamed out after cessation of operations. 2mm film on tube walls 18/10/2022 - demolished.
		Condensers (2 off)		0.00				Dia 0.68m x L 3.65m. X 132 x 0.038 dia tubes. Vessel drained & steamed out after cessation of operations. 2mm film on tube walls 18/10/2022 - demolished.
		Storage Area		0.00				13 IBCs in storage area. 01/12/2022 - remaining wastes at SBCO consist of COGM drums and arising coal tar sludge.
		Total Crude Benzole at SBCO	**319**	**0.00**				
	RCO	Oil/Vapour Heat Exchanger 1E401		1.18				1E401 O/V h/ex. Calc A) vol of BAO in vessel. Calculate 2nd substance A) vol of B/z condensates. Site measured and assumed 50% vol is BAO. Where l=4.876m, and r=0.419m. Use 0.5($\pi r^2 h$).
		Oil/Vapour Heat Exchanger 1E402		1.18				1E402 O/V h/ex. Calc A) vol of BAO in vessel. Calculate 2nd substance A) vol of B/z condensates. Site measured and assumed 50% vol is BAO. Where l=4.876m, and r=0.419m. Use 0.5($\pi r^2 h$).
		Oil/Vapour Heat Exchanger 2E401		1.18				2E401 O/V h/ex. Calc A) vol of BAO in vessel. Calculate 2nd substance A) vol of B/z condensates. Site measured and assumed 50% vol is BAO. Where l=4.876m, and r=0.419m. Use 0.5($\pi r^2 h$).
		Oil/Vapour Heat Exchanger 2E402		1.18				2E402 O/V h/ex. Calc A) vol of BAO in vessel. Calculate 2nd substance A) vol of B/z condensates. Site measured and assumed 50% vol is BAO. Where l=4.876m, and r=0.419m. Use 0.5($\pi r^2 h$).
		Benzole Condenser Heat Exchanger 1E411		0.22				1E411 old redundant b/z condensor. Calc A) vol in the tube bundle. Insufficient data. Assume 0.025m^3 of B/z residue in the tube bundle.
		Benzole Condenser Heat Exchanger 2E411		0.22				2E411 new b/z condensor. Calc A) vol in the tube bundle. Insufficient data. Known 208 tubes. Bore not known. Assume 0.025m^3 of B/z residue in the tube bundle.
		Dephlegmator Heat Exchanger 1E412		0.22				1E412 old redundant b/z condensor. Calc A) vol in the tube bundle. Insufficient data. Assume 0.025m^3 of B/z residue in the tube bundle.
		Dephlegmator Heat Exchanger 2E412		0.22				2E412 new b/z condensor. Calc A) vol in the tube bundle. Insufficient data. Known 208 tubes. Bore not known. Assume 0.025m^3 of B/z residue in the tube bundle.
		Benzole Separator 1G401		0.18				1G401 b/z sep. Calculate A) vol in the base, B) vol on the walls. Site measured where r=0.65m, drain level h= 0.13m. Use ($\pi r^2 h$). Calc vol on walls, where r=0.65m, height above the the drain h= 3.5m.and thickness on the walls w=0.002m. Use ($2\pi rhw$).

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
Crude Benzole		Benzole Separator 2G401		0.18	**50**	**200**		2G401 b/z sep. Calculate A) vol in the base, B) vol on the walls. Site measured where r=0.65m, drain level h= 0.13m. Use ($\pi r^2 h$). Calc vol on walls, where r=0.65m, height above the the drain h= 3.5m.and thickness on the walls w=0.002m. Use ($2\pi rhw$).
		P. Oil Separator OG403		0.11				OG403 p/oil sep. Calculate A) vol in the base, B) vol on the walls. Site measured where r=0.6m, drain level h= 0.08m. Use ($\pi r^2 h$). Calc vol on walls, where r=0.6m, height above the the drain h= 4.72m.and thickness on the walls w=0.002m. Use ($2\pi rhw$).
		Benzole Make Tank 1T404		0.63				1T404 b/z make tank. Calculate A) vol in the base, B) vol on the walls. Expected to be sludge residues asin previous tank removals. Horizontal tank with ellipsoidal ends. Calc vol b/z residues in tank base where ends =o.25m, l=3.76m, liquid to h to drain overflow h = 0.2m dia = 2.05m. Calc vol on walls. Calc V1, vol on x2 end walls assumed flat where r= 1.025m and thickness on walls w =0.002m. Use $2(\pi r^2 w)$. Calc V2, vol on horizontal tank walls where r=1.025m, l=3.76m and thickness on walls w =0.002m. Use ($2\pi rlw$). Add V1 to V2 to give total V on walls.
		Old Benzole Make Tank 1T404		0.63				1T404 b/z make tank. Calculate A) vol in the base, B) vol on the walls. Expected to be sludge residues asin previous tank removals. Horizontal tank with ellipsoidal ends. Calc vol b/z residues in tank base where ends =o.25m, l=3.76m, liquid to h to drain overflow h = 0.2m dia = 2.05m. Calc vol on walls. Calc V1, vol on x2 end walls assumed flat where r= 1.025m and thickness on walls w =0.002m. Use $2(\pi r^2 w)$. Calc V2, vol on horizontal tank walls where r=1.025m, l=3.76m and thickness on walls w =0.002m. Use ($2\pi rlw$). Add V1 to V2 to give total V on walls.
		Phlegm Oil Make Tank 2T404		0.63				2T404 p/oil make tank. Calculate A) vol in the base, B) vol on the walls. Expected to be sludge residues asin previous tank removals. Horizontal tank with ellipsoidal ends. Calc vol b/z residues in tank base where ends =o.25m, l=3.76m, liquid to h to drain overflow h = 0.2m dia = 2.05m. Calc vol on walls. Calc V1, vol on x2 end walls assumed flat where r= 1.025m and thickness on walls w =0.002m. Use $2(\pi r^2 w)$. Calc V2, vol on horizontal tank walls where r=1.025m, l=3.76m and thickness on walls w =0.002m. Use ($2\pi rlw$). Add V1 to V2 to give total V on walls.
		Old Phlegm Oil Make Tank 2T404		0.63				2T404 p/oil make tank. Calculate A) vol in the base, B) vol on the walls. Expected to be sludge residues asin previous tank removals. Horizontal tank with ellipsoidal ends. Calc vol b/z residues in tank base where ends =o.25m, l=3.76m, liquid to h to drain overflow h = 0.2m dia = 2.05m. Calc vol on walls. Calc V1, vol on x2 end walls assumed flat where r= 1.025m and thickness on walls w =0.002m. Use $2(\pi r^2 w)$. Calc V2, vol on horizontal tank walls where r=1.025m, l=3.76m and thickness on walls w =0.002m. Use ($2\pi rlw$). Add V1 to V2 to give total V on walls.
		Benzole North Oil Sump OA401B N		10.83				OA401 valve pit section. Calc A) vol of BAO residue in the base. Calculate 2nd substance A) vol of Benzole and water. (**ASSUME BENZOLE FOR WORST CASE SCENARIO UNTIL THE SPLIT IS QUANTIFIED**). Calc vol of residues in the base where, l=1.78m, b=2.6m, and residue h = 0.06. Use (lbh)
		Benzole South Oil Sump OA401B S		4.15				OA401 valve pit section. Calc A) vol of BAO residue in the base where, l=1.78m, b=2.6m, and residue h = 0.02. Use (lbh). Calculate 2nd substance A) vol of Benzole and water. (**ASSUME BENZOLE FOR WORST CASE SCENARIO UNTIL THE SPLIT IS QUANTIFIED**)
		Used Oil Tank OT408		0.00				OT408 condensate+poil tank. Calc A) vol in the tank, B) vol on tank walls. Tank dipped for level where the dip is h=0.125m. Dia =2.75m, ellipsoidal ends are 0.3m long, horizontal length of tank l=7.16m. Take vol from a reckoner. Calc vol on tankwalls, where the thickness on walls w = 0.002m, r=1.375m, l of horozontal straight section is 7.16m.Assume the two ends are flat. Use ($2\pi r^2 w$) + ($2\pi rlw$) Decontaminated 23/02/2022. 06/09/2022 - 1,640L removed from site by MGL

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Benzole Storage Tank 1T410		4.34				1T410 b/z storage tank. Calc A) vol in the tank base, B) vol on the tank walls. Note that the b/z in tank was floated off but an estmated but a 3" level of resides is expected. Assume h= 0.075m of benzole residues in the the tank base. Calc vol in base where r=4.375m. Use (πr^2h). Calc the voume on the walls where tank depth d=7.935m, r=4.375m,and the thickness on the walls w =0.002m. Use ($2\pi rdw$).
		Benzole Outloading FGS Vapour Pot		0.01				B/z outloading vapour pipework, Calc A) vol in the pot. Assume 0.015m³ in the sealpot.
		Total Crude Benzole at RCO		**27.94**				
	Total Crude Benzole		**742**	**27.94**				
-	**Total H2 Acute Toxic**		**742**	**27.94**				
Section 'P' – PHYSICAL HAZARDS								
P7 Pyrophoric Liquids and Solids in Pyrophoric Liquids Category 1 or Pyrophoric Solids Category 1								
	SBCO & Arterial COGM	Exhausters (2)		0.00			**ABOVE UPPER TIER** **The aggregate inventory of P7 Pyrophoric Liquids and Solids is above the upper-tier threshold due principally to the presence of coke oven gas main deposits on site.**	Dia 1m.x L 1.5m. a) Historically on inspection the casing & rotor normally c.50% fouled with COG deposits 18/10/2022 - demolished.
		Primary Ammonia Washer		0.00				Dia 3.5m H 30. N2 purged & drained. a) Ctr of base drain 50mm. b) Top of False Btm 200mm. c) 3 x COG hood stage levels 600mm each. 18/10/2022 - demolished.
		Secondary Ammonia Washer		0.00				Dia 5.08m H 42.06. N2 purged & drained. a) Ctr of base drain 500mm. B) Top of False Btm 600mm. c) Single COG hood stage level 600mm 18/10/2022 - demolished.
		No.1 Ammonia Washer		0.00				Dia 4.87m H 42. Out of service c. 1980. N2 purged & drained. Assume same inventory as No 3. Demolished May 2021; inventory stored onsite.
		No.2 Ammonia Washer		0.00				Dia 4.87m H 42. Out of service c. 1980. N2 purged & drained. Assume same inventory as No 3 Demolished May 2021; inventory stored onsite.
		No.3 Ammonia Washer		0.00				Dia 4.87m H 42. Out of service c. 1980. N2 purged & drained. a) Base hatch missing visible depth of material in base 600mm. b) Top of False Btm 600mm. c) single COG hood stage level 600mm Demolished May 2021; inventory stored onsite.
		Primary COG Cooler Downcomer		0				Height 19.37m x 0.512 18/10/2022 - demolished.
		Secondary COG Cooler Downcomer		0				Height 16.76m x 0.512 18/10/2022 - demolished.
		Primary NH3 Washer Downcomer		0.00				Height 24.48m x 0.512 18/10/2022 - demolished.
		Secondary NH3 Washer Downcomer		0.00				Height 38.45m x 0.512 18/10/2022 - demolished.
		No.1 NH3 Washer Downcomer		0.00				Height 38.41m x 0.512 Demolished May 2021; inventory stored onsite.
		No.2 NH3 Washer Downcomer		0.00				Height 38.41m x 0.512 Demolished May 2021; inventory stored onsite.
		No.3 NH3 Washer Downcomer		0.00				Height 38.41m x 0.512 Demolished May 2021; inventory stored onsite.
		No.1 Benzole Washer Downcomer		0.00				Height 35.70m x 0.512 18/10/2022 - demolished.
		No.2 Benzole Washer Downcomer		0.00				Height 35.70m x 0.512 18/10/2022 - demolished.
		No.3 Benzole Washer Downcomer		0.00				Height 35.70m x 0.512 18/10/2022 - demolished.
		SBCO By-Products COGM		0.00				L 941m x 0.512 Measured on Google Earth, August 2021 - approx. 50% of LP Main cleaned as part of Battery Phase 1
		Storage Area		258.24				640 205L drums stored onsite.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		RCO/SBCO Arterial COGM		0.00				L 7000m x 0.141 Measured on Google Earth; August 2021 - approx. 16.45% cleaned 04/07/2022 - Altrad estimate circa 643.75T remaining following completion of Section 1 and beginning of Section 5. 22/08/2022 - Altrad estimate circa 380T remaining on sections 5, 6, 7 and 8. 06/09/2022 - Altrad estimate circa 340T remaining on sections 5, 6 and 7. 18/10/2022 - estimated 38T remaining within Section 5. 20/10/2022 - decontamination complete. Material to be removed from site at Altrad Waste Treatment Plant.
		SBCO/TLRS Arterial COGM		0.00				L 1700m x 0.141 Measured on Google Earth; decontaminated Q3-Q4 2020
		Lackenby Arterial COGM		0.00				L 5000m x 0.141 Measured on Google Earth; Phase 1 (BOS-COV-01 - CC-COV-01) decontaminated August 2021 10/06/2022 - decontamination and demolition by KDC complete.
		RSP/RBF/RPS Arterial COGM		2.00				L 4000m x 0.141 Measured on Google Earth 03/11/2022 - 6T remaining at RSP; Teesworks currently applying water to single section at RPS; estimated IBC's worth present. 01/12/2022 - RSP quantities now estimated to be less than 1T.
		RCO By-Products COGM		395.43				L 639m x 0.384 Measured on Google Earth
		ASUK Waste Treatment Plant		32.28				20/10/2022 - 80 drums stored at ASUK Plant.
		Pactec Bags Storage		217.26				Stored at Iron Gran Plant pending TFS approval. 14/12/2022 - 14.82T removed from site. 31/01/2023 - 14.86T removed from site.
		Total COGM Deposits at SBCO & Arterial COGM		**905.21**				
	RCO	Exhauster 1B101		1.21				Vessel on a N_2 blanket. Calc A) volume in the vessel 50% full from past cleaning. = 0.75m³.
		Exhauster OB102		1.21				Vessel on a N_2 blanket. Calc A) volume in the vessel 50% full from past cleaning. = 0.75m³.
		Exhauster 2B101		1.21				Vessel on a N_2 blanket. Calc A) volume in the vessel 50% full from past cleaning. = 0.75m³.
		DLSP COG Main to Battery S101A		0.04				COGM deposits. r=0.168m,assume thickness in the walls is 0.005m, level above base deposits to o/flow h=2.42m, B) r=0.168m, h=0.1m COGM condy r=0.1268m, h=2.42m
		DLSP COG Main to Battery S101B		0.04				COGM deposits. r=0.168m,assume thickness in the walls is 0.005m, level above base deposits to o/flow h=2.42m, B) r=0.168m, h=0.1m COGM condy r=0.1268m, h=2.42m
		DS COG Main to Battery S101C		0.60				COGM deposits r=0.625m, internal h=1.5m, deposits in base 0.3m. Tank dipped COGM condensate r=0.625m, internal h=1.5m, condy above the deposits in base h=0.36m. Tank dipped
		Donkin Sealpot adjacent to CO21		0.40				COGM deposits r=0.625m, internal h=1.5m, deposits in base 0.02m. Tank dipped COGM condensate r=0.625m, internal h=1.5m, condy in base above thedeposits h=0.78m. Tank dipped
		D/L Sealpot 1°c Outlet Manifold S105		0.08				Calculate A) vol COGM deposits in the base r=0.125m, h=1.03m. Site measured. Sealpot h=1.2m, overflow h=1.05m, B) vol of deposits on the walls R=0.125, h=0.17. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.125m, h condy =0.02m.
		D/L Sealpot 1°c Outlet Manifold S106		0.09				Calculate A) vol COGM deposits in the base r=0.125m, h=1.05m. Site measured. Sealpot h=1.2m, overflow h=1.05m, B) vol of deposits on the walls R=0.125, h=0.15. Assume wall deposit thickness w=0.005m. Site measured Note, no COGM condensate in the sealpot, full.
		DLSP 2B101 Exhaust Inlet Manifold		0.05				Calculate A) vol COGM deposits in the base r=0.125m, h=0.6m. Site measured. Sealpot h=1.1m, overflow h=0.92m, B) vol of deposits on the walls R=0.125, h=0.57. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.125m, h condy =0.32m.
		DLSP 0B102 Exhaust Inlet Manifold		0.05				Calculate A) vol COGM deposits in the base r=0.125m, h=0.53m. Site measured. Sealpot h=1.1m, overflow h=0.92m, B) vol of deposits on the walls R=0.125, h=0.57m. Assume wall deposit thickness w=0.005m. Site measured.
		DLSP 1B101 Exhaust Inlet Manifold		0.05				Calculate A) vol COGM deposits in the base r=0.125m, h=0.6m. Site measured. Sealpot h=1.1m, overflow h=0.92m, B) vol of deposits on the walls R=0.125, h=0.57. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.125m, h condy =0.32m.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
Coke Oven Gas Main Deposits		1B101 DLSP Exhaust Outlet Manifold		0.06	**50**	**200**		Calculate A) vol COGM deposits in the base r=0.1m, h=1.1m. Site measured. Sealpot h=2.8m, overflow h=2.46m, B) vol of deposits on the walls R=0.125, h=1.7. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.1m, h condy =1.26m.
		2B101 DLSP Exhaust Outlet Manifold		0.01				Calculate A) vol of deposits on the walls R=0.125, h=2.8. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot. Note the sealpot is full of condensate R= 0.1, h condy =2.64m
		1C101 Syphon Breaker		0.02				Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.
		1C102 Syphon Breaker		0.02				Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.
		2C101 Syphon Breaker		0.02				Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.
		2C102 Syphon Breaker		0.02				Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.
		1C201 Dipleg Sealpot		0.48				Calculate A) COGM deposits in base h= 2.475m, r= 0.193m (Height of sealpot 3.2m) (Height of sealpot overflow2.82m) , B) calc COGM deposits on the walls 2πrhw r=0.193m, h=0.42m, thickness on walls w= 0.1m. Calculate 2nd substance A) vol of COGM condy in the pot $2\pi r^2h$, where 0.193m, h= 0.305m..
		2C201 Dipleg Sealpot		0.08				Calculate A) COGM deposits in base h= 0.280m. r= 0.193m (Height of sealpot 3.2m) (Height of sealpot overflow2.82m) , B) calc COGM deposits on the walls 2πrhw r=0.193m, h=1.55m, thickness on walls w= 0.1m. Calculate 2nd substance A) vol of COGM condy in the pot $2\pi r^2h$, where h=0.193, h= 1.37m.
		Ammonia Incinerator Jet Ports 1F301		0.01				1F301 incinerator jet ports. Calculate A) vol of COGM deposits in the burner jets estmated COGM deposits from experience 0.005m^3
		Ammonia Incinerator Jet Ports 2F301		0.01				2F301 incinerator jet ports. Calculate A) vol of COGM deposits in the burner jets estmated COGM deposits from experience 0.005m^3
		1F Incinerator Gas Booster		0.00				1B303 gas booster. Calculate A) vol of COGM deposits in the booster. From experience removing boosters circa 0.003m^3
		2F Incinerator Gas Booster		0.00				2B303 gas booster. Calculate A) vol of COGM deposits in the booster. From experience removing boosters circa 0.003m^3
		1F301 Inlet Gas Sealpot		0.01				S301 dipleg s/pot. Calulate A) vol of COGM condensate where r=0.09m and h= 2.17m. Use (πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.09m and h= 0.37m Use (πr^2h). Site measured.
		2F301 Inlet Gas Sealpot		0.01				S302 dipleg s/pot. Calulate A) vol of COGM condensate where r=0.09m and h= 2.17m. Use (πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.384m, overflow h=2.575m, and thckness on the walls is 0.002m. (Use $2\pi r^2hw$). Site measured.
		Incinerator Ammonia Sump		0.70				OA303 NH3 sump. Calculate A) vol in base where l=3m, b=3m and height of deposits in base =0.025m, B) vol on walls where l=3m, b=3m, h=1.75m athickness on walls w=0.01m. Use 2(l+b)hw. Calculate 2nd substance A) vol of CRW in the sump. Note, the sump was emptied and partially cleaned after closure. Site measured. The sump level varies with rain and is emptied by tanker periodically. Calc max vol of CRW where l=3m, b=3m, amd h=1.75m. Use (lbh)
		1C301 Inlet Dipleg Sealpot		0.01				S304 sealpot has been removed from service but contains COGM condensates+ residues. Calculate A) vol of the COGM condensate where r=0.384m, overflow h=2.575m. (Use πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.384m, overflow h=2.575m, and thckness on the walls is 0.002m. (Use $2\pi r^2hw$). Site measured.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		2C301 Inlet Dipleg Sealpot		0.01				S305 sealpot has been removed from service but contains COGM condensates+ residues. Calculate A) vol of the COGM condensate where r=0.384m, overflow h=2.575m. (Use $\pi r^2 h$). Calculate 2nd substance A) vol of COGM deposits where r=0.384m, overflow h=2.575m, and thckness on the walls is 0.002m. (Use $2\pi r^2 hw$). Site measured.
		1C402 U-Seal Pipework		0.02				S401 u-seal pipe. Calc A) vol in pipes u-seal at overflow level. Length of pipe around ocerflow section sof U-seal l=7m, pipe r= 0.025m. Use ($\pi r^2 l$).
		2C402 U-Seal Pipework		0.02				S402 u-seal pipe. Calc A) vol in pipes u-seal at overflow level. Length of pipe around ocerflow section sof U-seal l=7m, pipe r= 0.025m. Use ($\pi r^2 l$).
		Gas Flarestack		3.23				OF501 flarestack. Cac A) vol of COGM deposits in the stack. This cannot be seen to quantify, but base on the cleaning in 2018 there were still residues further up thae stack that were not cleaned. On this base we would estimate a further $2m^3$ of COGM deposits remaining inside the flarestack walls. Note the stack operation is tested and will operate at full bore if the flare controllers opened.
		Gasholder Free Space inside the dam		1001.77				Based on SBCO findings assume a levele of 0.7m COGM solids. Calc A) vol inside the outer dam. Note circa $40m^3$ of sealant was lost+ replaced towards the last 6 months of ops, and is expected here. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. Calc vol of COGM deposits in the free space where it is assumed that the level of COGM deposits h=0.7m, r inside the dam =16.8m. Use ($\pi r^2 h$).
		Dipleg Sealpot at west end of Final Naphthalene Washers		0.02				S501A/B gas DLSP. Calc A) vol of COGM deposits in the base where r=0.384m, overflow h=2.575m. (Use $\pi r^2 h$). Calculate 2nd substance A) vol of COGM condensates in the s/pot where level between overflow and deposits in the base h=2.18m, and r=0.09m . Use ($\pi r^2 h$). Site measured
		Sealpot next to 2W501		0.02				S502 gas main DLSP near 2W501. Calc A) vol osf COGM deposits in the base where r=0.09m and height of deposits h= 0.415m. Use ($\pi r^2 h$). (Info only, depth of pot = 0.58m). Site Measured
		Stretford Loading Main Dipleg		0.02				S503A/B/C east stretford loading gas DLSP. Calc A) vol of COGM deposits in the base where r=0.384m, overflow h=2.575m. (Use $\pi r^2 h$). Calculate 2nd substance A) vol of COGM condensates in the s/pot where level between overflow and deposits in the base h=2.18m, and r=0.09m . Use ($\pi r^2 h$). Site measured
		Outlet Flarestack Sealpot		0.05				S507A flarestack inlet Donkin sealpot. Calc A) vol of COGM residue in the base where h =01m , horizontal l=0.92m and dia = 0.785m, Use reckoner. Site Measured
		Inlet Flarestack Seal Pot		0.05				S507B flarestack inlet Donkin sealpot. Calc A) vol of COGM residue in the base where h =0.1m. , horizontal l=1.0m and dia = 0.59m, Use reckoner. Site Measured
		Booster LPGM Sealpot		0.15				S511A/B/C/D booster LP donkin sealpot. Calc A) vol of COGM residue in the base where h =0.1m, horizontal l=2.4m and dia = 0.9m, Use reckoner. Site Measured
		1B501 Outlet Main Sealpot		0.56				S512, 1B501 booster outlet HP donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=2.4m and dia = 0.9m, Use reckoner. Site Measured. Residue level assumed the same as S514 where residue is visible.
		0B502 Outlet Main Sealpot		0.56				S513, OB502 booster outlet HP donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=2.4m and dia = 0.9m, Use reckoner. Site Measured. Residue level assumed same as S514 where residue is visible
		2B501 Outlet Main Sealpot		0.56				S514, 2B501 booster outlet HP donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=2.4m and dia = 0.9m, Use reckoner. Site Measured. Residue level is visible.
		Gas Export Main South Sealpot		0.21				S515 gas export main S donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=0.91m and dia = 0.89m, Use reckoner. Site Measured
		Gas Export Main North Sealpot		0.21				S516 gas export main N donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=0.91m and dia = 0.89m, Use reckoner. Site Measured
		Gas Export Main Centre Sealpot		0.21				S516A gas export main centre donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=0.91m and dia = 0.89m, Use reckoner. Site Measured
		Gas Export Main Old Redundant Sealpot		0.21				S516 gas export redundant old donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=0.90m and dia = 0.9m, Use reckoner. Site Measured. The sealpot is physically disconnected but contains COGM residues
		Gasholder Inlet Main Donkin Sealpot		0.82				S521 Gasholder impex donkin sealpot where r=0.52m, residue h=06m, assumed from previous events. Use ($\pi r^2 h$).
		Flarestack Pilot Sealpot		0.03				S524 flarestack redundat pilot sealpot. Calc A) vol of COGM residue in the base where r=0.14m, residue h=0.3m. Use ($\pi r^2 h$). Site Measured.
		S508 Fibreglass Bunded Condensate Tank		0.06				S508 Flarestack fibreglass (bunded) condy tank. Calc A) vol of COGM condensate in the sealpot where r=0.775m and residue h= 0.02m. Use ($\pi r^2 h$). Site Measured
		Dipleg H2S/HCN Inlet Gas Main		0.02				S701 H_2S/HCN gas main DLSP. Calc A) vol of COGM deposits in the base where r=0.1m, residue h=0.15m. (Use $\pi r^2 h$), B) vol of COGM deposits on the walls where r=0.1m, overflow h=2.57m and wall thickness w=0.005. Use ($2\pi rhw$). Calculate 2nd substance A) vol of COGM condensates in the s/pot where r=0.1m, overflow h=2.575m. (Use $\pi r^2 h$). Site measured

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Dipleg H2S/HCN Inlet Gas Main		0.02				S702 H_2S/HCN gas main DLSP. Calc A) vol of COGM deposits in the base r=0.1m, residue h=0.15m. (Use πr^2h), B) vol of COGM deposits on the walls where r=0.1m, overflow h=2.25m and wall thickness w=0.005. Use ($2\pi rhw$). Calculate 2nd substance A) vol of COGM condensates in the s/pot where r=0.1m, overflow h=2.575m. (Use πr^2h). Site measured
		Sealpot H2S/HCN Inlet Gas Main		0.02				S703A/B Inlet gas main DLSP. Calc A) vol of COGM deposits in the base where r=0.1m, residue h=0.15m. (Use πr^2h), B) vol of COGM deposits on the walls where r=0.1m, overflow h=2.57m and wall thickness w=0.005. Use ($2\pi rhw$). Calculate 2nd substance A) vol of COGM condensates in the s/pot where r=0.1m, overflow h=2.575m. (Use πr^2h). Site measured
		Total COGM Deposits at RCO		**1015.37**				
	Total P7 Pyrophoric Liquids and Solids			**1920.58**				**The calculations for P7 Pyrophoric Liquids and Solids have been duplicated and included in the E1 Hazardous to the Aquatic Environment inventory, where the volumes in m^3 have been reduced by 50% in order to account for the presence of naphthalene (assumed to be 50%) within the Coke Oven Gas Main deposits.**
Section 'E' – ENVIRONMENTAL HAZARDS								
E1 Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1								
Gasholder Sealant	RCO	Tank 1 OT511	60	0.00			**ABOVE UPPER TIER** **The aggregate inventory of E1 Hazardous to the Aquatic Environment is above the upper-tier threshold due principally to the presence of coke oven gas main deposits (approx. 50% naphthalene) on site.**	OT511 tar sealant pump tank. Calc A) vol of sealant inside the tank sections. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. From the Leffers handbook the combined operating vol of the tank is is 1.26m^3 28/02/2022 - inventory removed, Jan 2022. Tank not cleaned.
		Tank 2 OT512	60	0.00				OT512 tar sealant pump tank. Calc A) vol of sealant inside the tank sections. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. From the Leffers handbook the combined operating vol of the tank is is 1.26m^3 28/02/2022 - inventory removed, Jan 2022. Tank not cleaned.
		Tar Sealant Pump Tank OT513		0.00				sealant is a mixture of gasholder tar sealant and petroleum based sealant. From the Leffers handbook the combined operating vol of the tank is is 1.26m^3 28/02/2022 - inventory removed, Jan 2022. Tank not cleaned.
		511 Pumping Station	Not known in 2015					
		512 Pumping Station	Not known in 2015					
		513 Pumping Station	Not known in 2015					
		Pipework	Not known in 2015	1.41				Gasholder riser pipes x3. Calc A) the combined vol of sealant in the x3 riser pipes. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. The pipe risers to the emergenct sealant tanks. From the Leffers handbook the combined vol of all x3 risers is 1.23m^3
		511 Storage tanks	Not known in 2015	0.00				511 emergency sealant tank. Calc A) vol of sealant inside the 2 tank sections. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. From the Leffers handbook the operating vol is 1.62m^3 combined for the two tanks at operating levels 28/02/2022 - inventory removed, Jan 2022. Tank not cleaned.
		512 Storage tanks	Not known in 2015	0.00				512 emergency sealant tank. Calc A) vol of sealant inside the 2 tank sections. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. From the Leffers handbook the operating vol is 1.62m^3 combined for the two tanks at operating levels 28/02/2022 - inventory removed, Jan 2022. Tank not cleaned.
		513 Storage tanks	Not known in 2015	0.00				513 emergency sealant tank. Calc A) vol of sealant inside the 2 tank sections. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. From the Leffers handbook the operating vol is 1.62m^3 combined for the two tanks at operating levels 28/02/2022 - inventory removed, Jan 2022. Tank not cleaned.
		Shell film	Not known in 2015	2.47				Gaholder shell wall. Calc A)0 vol of sealant on the gasholder wall. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. From the Leffers handbook te normal vol on the walls based on 0.5mm film is 2.15m^3.
		Piston trough	Not known in 2015	32.81				Piston trough. Calc A) volof sealant on the piston trough. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. From the Leffers handbook the combined trou gh sealant volume at the 225mm normal operating seal level seal level is 28.53m^3.
		Outer dam	Not known in 2015	27.60				Gasholder inner dam. Calc A) volof sealant in the inner dam lute. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. From the leffers handbook the cobined volume would be 24m^3.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Gasholder Free Space Inside the Dam		46.00				Based on SBCO findings assume a levele of 0.7m COGM solids. Calc A) vol inside the outer dam. Note circa 40m³ of sealant was lost+ replaced towards the last 6 months of ops, and is expected here. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. Calc vol of COGM deposits in the free space where it is assumed that the level of COGM deposits h=0.7m, r inside the dam =16.8m. Use ($\pi r^2 h$).
		Gasholder Sealant Storage Tank No1		0.00				Gasholder sealant tank No1. Calc A) vol of gasholder tar sealant in the base, B) vol of tar sealant on the walls where h =0.05m. Calc vol in tank base where, horizontal l=9.2m, dia = 2.65m, ellipsoidal ends l=0.3m, Use reckoner. Wall thickness = 0.002m, l=9.2m, r = 1.325m, Assume that the x2 elipsoidal ends are flat.Use ($2\pi rlw$) + ($2\pi r^2 w$). Horizontal tank with ellipsoidal ends. Site measured 28/02/2022 - inventory removed, Jan 2022. Tank not cleaned.
		Gasholder Sealant Storage Tank No2		0.00				Gasholder sealant tank No2. Calc A) vol of gasholder tar sealant in the base where h =0.558m, horizontal l=9.2m, dia = 2.65m , ellipsoidal ends are =0.3m, Use reckoner., B) vol of tar sealant on the walls. Horizontal tank with ellipsoidal ends. Site measured. Wall thickness = 0.002m, l=9.2m, r = 1.325m, Assume that the x2 elipsoidal ends are flat.Use ($2\pi rlw$) + ($2\pi r^2 w$). Horizontal tank with ellipsoidal ends. Site measured 28/02/2022 - inventory removed, Jan 2022. Tank not cleaned.
		Gasholder Tar Sealant Bund		5.89				Gasholder tar sealant tank bund. Calc A) vol of gasholder tar sealant contaminated breeze inside the bund where l=12.8m, b=8m, D= 1.275m and residue h = 0.05m. Use (lbh). Site measured
	Total Gasholder Sealant		**90**	**116.18**				
	RCO	Naphthalene Condenser		1.02				Calculate A) vol of naphthalene. Calculate 2nd substance A) vol of cooling water. Assume internal volume in tubes is 1/3 of the volume of the H/Ex where l=5.526m, and r=0.45, The volume of naphthalene = $\pi r^2 l/3$
		Naphthalene Separator		0.07				The separator has been drained to the drain level Calculate A) volume of nap in the separator base $\Pi r^2 h$, where h = 0.05m and r=0.55m, B) vol on the walls $2\pi rlw$, where r=0.55m, h =1.66m and thickness on walls w = 0.002m
		Naphthalene Oil Make Tank		0.18				The tank was pumped empty at closure. Calculate A) volume on the walls $2\pi rhw$, where r=1.125m, h=3.72m and thickness on the wall is assumed 0.005m, B) volume in the base wall $\pi r^2 w$. Assume w=0.005m, r=1.125m
		Old Naphthalene Oil Make Tank		0.18				The tank was pumped empty at closure. Calculate A) volume on the walls $2\pi rhw$, where r=1.125m, h=3.72m and thickness on the wall is assumed 0.005m, B) volume in the base wall $\pi r^2 w$. Assume w=0.005m, r=1.125m
		Sump Valve Pit OA201		4.05				OA201 sump. Calculate A) vol of naphthalene in the valve pit where l=7.6m, b=1.7m, and nap sludge level =0.27m. Calculate 2nd substance A) vol of oil contaminated water in the valve pit. (Max fill vol =30.78m³) where l=7.6m, b=1.7m, and oil contaminated water level h =2.58m
		South Water Sump OA201		6.44				OA201 sump. Calculate A) vol of naphthalene in the water section where l=3.8m, b=2.7m, and nap sludge level =0.54. Calculate 2nd substance A) vol of rainwater in the water section where l=3.8m, b=2.7m, and water level is max at 2.46m (above the nap level =0.54). (Max fill vol =30.78m³) water level varies with rain and pump transfers.
		Vapour Separator 1T315		0.07				1T315 vap sep. Calculate A) vol nap on side walls where h=0.97m, r=0.3m, thickness on the walls =0.025m. Use ($2\pi rhw$). B) vol of nap on cone wall where h=0.31m, r=0.3m, thickness on the walls =0.025m. Use $\pi r(r+\sqrt{h^2+r^2})$ w.
		Vapour Separator 2T315		0.07				2T315 vap sep. Calculate A) vol nap on side walls where h=0.97m, r=0.3m, thickness on the walls =0.025m. Use ($2\pi rhw$). B) vol of nap on cone wall where h=0.31m, r=0.3m, thickness on the walls =0.025m. Use $\pi r(r+\sqrt{h^2+r^2})$ w.
		Vapour Separator 1T314		0.07				1T314 vap sep. Calculate A) vol nap on side walls where h=0.97m, r=0.3m, thickness on the walls =0.025m. Use ($2\pi rhw$). B) vol of nap on cone wall where h=0.31m, r=0.3m, thickness on the walls =0.025m. Use $\pi r(r+\sqrt{h^2+r^2})$ w.
		Vapour Separator 2T314		0.07				2T314 vap sep. Calculate A) vol nap on side walls where h=0.97m, r=0.3m, thickness on the walls =0.025m. Use ($2\pi rhw$). B) vol of nap on cone wall where h=0.31m, r=0.3m, thickness on the walls =0.025m. Use $\pi r(r+\sqrt{h^2+r^2})$ w.
		Vapour Separator 0C305 OT314		0.07				OT314 vap sep. Calculate A) vol nap on side walls where h=0.97m, r=0.3m, thickness on the walls =0.025m. Use ($2\pi rhw$). B) vol of nap on cone wall where h=0.31m, r=0.3m, thickness on the walls =0.025m. Use $\pi r(r+\sqrt{h^2+r^2})$ w.

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		Vapour Separator 1C304		0.07				1C304 vap sep. Calculate A) vol nap on side walls where h=0.97m, r=0.3m, thickness on the walls =0.025m. Use (2πrhw). B) vol of nap on cone wall where h=0.31m, r=0.3m, thickness on the walls =0.025m. Use πr(r+V h^2+r^2) w.
		Vapour Separator 2C304		0.07				2C304 vap sep. Calculate A) vol nap on side walls where h=0.97m, r=0.3m, thickness on the walls =0.025m. Use (2πrhw). B) vol of nap on cone wall where h=0.31m, r=0.3m, thickness on the walls =0.025m. Use πr(r+V h^2+r^2) w.
		Exhauster 1B101		0.44				Vessel on a N_2 blanket. Calc A) volume in the vessel 50% full from past cleaning. = 0.75m^3.
		Exhauster OB102		0.44				Vessel on a N_2 blanket. Calc A) volume in the vessel 50% full from past cleaning. = 0.75m^3.
		Exhauster 2B101		0.44				Vessel on a N_2 blanket. Calc A) volume in the vessel 50% full from past cleaning. = 0.75m^3.
		DLSP COG Main to Battery S101A		0.01				COGM deposits. r=0.168m,assume thickness in the walls is 0.005m, level above base deposits to o/flow h=2.42m, B) r=0.168m, h=0.1m COGM condy r=0.1268m, h=2.42m
		DLSP COG Main to Battery S101B		0.01				COGM deposits. r=0.168m,assume thickness in the walls is 0.005m, level above base deposits to o/flow h=2.42m, B) r=0.168m, h=0.1m COGM condy r=0.1268m, h=2.42m
		DS COG Main to Battery S101C		0.21				COGM deposits r=0.625m, internal h=1.5m, deposits in base 0.3m. Tank dipped COGM condensate r=0.625m, internal h=1.5m, condy above the deposits in base h=0.36m. Tank dipped
		Donkin Sealpot adjacent to CO21		0.14				COGM deposits r=0.625m, internal h=1.5m, deposits in base 0.02m. Tank dipped COGM condensate r=0.625m, internal h=1.5m, condy in base above thedeposits h=0.78m. Tank dipped
		D/L Sealpot 1°c Outlet Manifold S105		0.03				Calculate A) vol COGM deposits in the base r=0.125m, h=1.03m. Site measured. Sealpot h=1.2m, overflow h=1.05m, B) vol of deposits on the walls R=0.125, h=0.17. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.125m, h condy =0.02m.
		D/L Sealpot 1°c Outlet Manifold S106		0.03				Calculate A) vol COGM deposits in the base r=0.125m, h=1.05m. Site measured. Sealpot h=1.2m, overflow h=1.05m, B) vol of deposits on the walls R=0.125, h=0.15. Assume wall deposit thickness w=0.005m. Site measured Note, no COGM condensate in the sealpot, full.
		DLSP 2B101 Exhaust Inlet Manifold		0.02				Calculate A) vol COGM deposits in the base r=0.125m, h=0.6m. Site measured. Sealpot h=1.1m, overflow h=0.92m, B) vol of deposits on the walls R=0.125, h=0.57. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.125m, h condy =0.32m.
		DLSP 0B102 Exhaust Inlet Manifold		0.02				Calculate A) vol COGM deposits in the base r=0.125m, h=0.53m. Site measured. Sealpot h=1.1m, overflow h=0.92m, B) vol of deposits on the walls R=0.125, h=0.57m. Assume wall deposit thickness w=0.005m. Site measured.
		DLSP 1B101 Exhaust Inlet Manifold		0.02				Calculate A) vol COGM deposits in the base r=0.125m, h=0.6m. Site measured. Sealpot h=1.1m, overflow h=0.92m, B) vol of deposits on the walls R=0.125, h=0.57. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.125m, h condy =0.32m.
		1B101 DLSP Exhaust Outlet Manifold		0.02				Calculate A) vol COGM deposits in the base r=0.1m, h=1.1m. Site measured. Sealpot h=2.8m, overflow h=2.46m, B) vol of deposits on the walls R=0.125, h=1.7. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.1m, h condy =1.26m.
		2B101 DLSP Exhaust Outlet Manifold		0.01				Calculate A) vol of deposits on the walls R=0.125, h=2.8. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot. Note the sealpot is full of condensate R= 0.1, h condy =2.64m
		1C101 Syphon Breaker		0.01				Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.
		1C102 Syphon Breaker		0.01				Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
Naphthalene		2C101 Syphon Breaker		0.01	100	200		Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.
		2C102 Syphon Breaker		0.01				Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.
		1C201 Dipleg Sealpot		0.17				Calculate A) COGM deposits in base h= 2.475m, r= 0.193m (Height of sealpot 3.2m) (Height of sealpot overflow2.82m) , B) calc COGM deposits on the walls 2πrhw r=0.193m, h=0.42m, thickness on walls w= 0.1m. Calculate 2nd substance A) vol of COGM condy in the pot $2\pi r^2h$, where 0.193m, h= 0.305m..
		2C201 Dipleg Sealpot		0.03				Calculate A) COGM deposits in base h= 0.280m. r= 0.193m (Height of sealpot 3.2m) (Height of sealpot overflow2.82m) , B) calc COGM deposits on the walls 2πrhw r=0.193m, h=1.55m, thickness on walls w= 0.1m. Calculate 2nd substance A) vol of COGM condy in the pot $2\pi r^2h$, where h=0.193, h= 1.37m.
		Ammonia Incinerator Jet Ports 1F301		0.00				1F301 incinerator jet ports. Calculate A) vol of COGM deposits in the burner jets estmated COGM deposits from experience 0.005m^3
		Ammonia Incinerator Jet Ports 2F301		0.00				2F301 incinerator jet ports. Calculate A) vol of COGM deposits in the burner jets estmated COGM deposits from experience 0.005m^3
		1F Incinerator Gas Booster		0.00				1B303 gas booster. Calculate A) vol of COGM deposits in the booster. From experience removing boosters circa 0.003m^3
		2F Incinerator Gas Booster		0.00				2B303 gas booster. Calculate A) vol of COGM deposits in the booster. From experience removing boosters circa 0.003m^3
		1F301 Inlet Gas Sealpot		0.01				S301 dipleg s/pot. Calulate A) vol of COGM condensate where r=0.09m and h= 2.17m. Use (πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.09m and h= 0.37m Use (πr^2h). Site measured.
		2F301 Inlet Gas Sealpot		0.01				S302 dipleg s/pot. Calulate A) vol of COGM condensate where r=0.09m and h= 2.17m. Use (πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.384m, overflow h=2.575m, and thckness on the walls is 0.002m. (Use $2\pi r^2hw$). Site measured.
		Incinerator Ammonia Sump		0.25				OA303 NH3 sump. Calculate A) vol in base where l=3m, b=3m and height of deposits in base =0.025m, B) vol on walls where l=3m, b=3m, h=1.75m athickness on walls w=0.01m. Use 2(l+b)hw. Calculate 2nd substance A) vol of CRW in the sump. Note, the sump was emptied and partially cleaned after closure. Site measured. The sump level varies with rain and is emptied by tanker periodically. Calc max vol of CRW where l=3m, b=3m, amd h=1.75m. Use (lbh)
		1C301 Inlet Dipleg Sealpot		0.00				S304 sealpot has been removed from service but contains COGM condensates+ residues. Calculate A) vol of the COGM condensate where r=0.384m, overflow h=2.575m. (Use πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.384m, overflow h=2.575m, and thckness on the walls is 0.002m. (Use $2\pi r^2hw$). Site measured.
		2C301 Inlet Dipleg Sealpot		0.00				S305 sealpot has been removed from service but contains COGM condensates+ residues. Calculate A) vol of the COGM condensate where r=0.384m, overflow h=2.575m. (Use πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.384m, overflow h=2.575m, and thckness on the walls is 0.002m. (Use $2\pi r^2hw$). Site measured.
		1C402 U-Seal Pipework		0.01				S401 u-seal pipe. Calc A) vol in pipes u-seal at overflow level. Length of pipe around ocerflow section sof U-seal l=7m, pipe r= 0.025m. Use (πr^2l).
		2C402 U-Seal Pipework		0.01				S402 u-seal pipe. Calc A) vol in pipes u-seal at overflow level. Length of pipe around ocerflow section sof U-seal l=7m, pipe r= 0.025m. Use (πr^2l).
		Gas Flarestack		1.16				OF501 flarestack. Cac A) vol of COGM deposits in the stack. This cannot be seen to quantify, but base on the cleaning in 2018 there were still residues further up thae stack that were not cleaned. On this base we would estimate a further 2m^3 of COGM deposits remaining inside the flarestack walls. Note the stack operation is tested and will operate at full bore if the flare controllers opened.
		Gasholder Free Space inside the dam		360.62				Based on SBCO findings assume a levele of 0.7m COGM solids. Calc A) vol inside the outer dam. Note circa 40m^3 of sealant was lost+ replaced towards the last 6 months of ops, and is expected here. Note that the gasholder sealant is a mixture of gasholder tar sealant and petroleum based sealant. Calc vol of COGM deposits in the free space where it is assumed that the level of COGM deposits h=0.7m, r inside the dam =16.8m. Use (πr^2h).

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Dipleg Sealpot at west end of Final Naphthalene Washers		0.01				S501A/B gas DLSP. Calc A) vol of COGM deposits in the base where r=0.384m, overflow h=2.575m. (Use $\pi r^2 h$). Calculate 2nd substance A) vol of COGM condensates in the s/pot where level between overflow and deposits in the base h=2.18m, and r=0.09m . Use ($\pi r^2 h$). Site measured
		Sealpot next to 2W501		0.01				S502 gas main DLSP near 2W501. Calc A) vol osf COGM deposits in the base where r=0.09m and height of deposits h= 0.415m. Use ($\pi r^2 h$). (Info only, depth of pot = 0.58m). Site Measured
		Stretford Loading Main Dipleg		0.01				S503A/B/C east stretford loading gas DLSP. Calc A) vol of COGM deposits in the base where r=0.384m, overflow h=2.575m. (Use $\pi r^2 h$). Calculate 2nd substance A) vol of COGM condensates in the s/pot where level between overflow and deposits in the base h=2.18m, and r=0.09m . Use ($\pi r^2 h$). Site measured
		Outlet Flarestack Sealpot		0.02				S507A flarestack inlet Donkin sealpot. Calc A) vol of COGM residue in the base where h =01m , horizontal l=0.92m and dia = 0.785m, Use reckoner. Site Measured
		Inlet Flarestack Seal Pot		0.02				S507B flarestack inlet Donkin sealpot. Calc A) vol of COGM residue in the base where h =0.1m. , horizontal l=1.0m and dia = 0.59m, Use reckoner. Site Measured
		Booster LPGM Sealpot		0.05				S511A/B/C/D booster LP donkin sealpot. Calc A) vol of COGM residue in the base where h =0.1m, horizontal l=2.4m and dia = 0.9m, Use reckoner. Site Measured
		1B501 Outlet Main Sealpot		0.20				S512, 1B501 booster outlet HP donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=2.4m and dia = 0.9m, Use reckoner. Site Measured. Residue level assumed the same as S514 where residue is visible.
		0B502 Outlet Main Sealpot		0.20				S513, OB502 booster outlet HP donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=2.4m and dia = 0.9m, Use reckoner. Site Measured. Residue level assumed same as S514 where residue is visible
		2B501 Outlet Main Sealpot		0.20				S514, 2B501 booster outlet HP donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=2.4m and dia = 0.9m, Use reckoner. Site Measured. Residue level is visible.
		Gas Export Main South Sealpot		0.08				S515 gas export main S donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=0.91m and dia = 0.89m, Use reckoner. Site Measured
		Gas Export Main North Sealpot		0.08				S516 gas export main N donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=0.91m and dia = 0.89m, Use reckoner. Site Measured
		Gas Export Main Centre Sealpot		0.08				S516A gas export main centre donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=0.91m and dia = 0.89m, Use reckoner. Site Measured
		Gas Export Main Old Redundant Sealpot		0.08				S516 gas export redundant old donkin sealpot. Calc A) vol of COGM residue in the base where h =0.25m, horizontal l=0.90m and dia = 0.9m, Use reckoner. Site Measured. The sealpot is physically disconnected but contains COGM residues
		Gasholder Inlet Main Donkin Sealpot		0.30				S521 Gasholder impex donkin sealpot where r=0.52m, residue h=06m, assumed from previous events. Use ($\pi r^2 h$).
		Flarestack Pilot Sealpot		0.01				S524 flarestack redundat pilot sealpot. Calc A) vol of COGM residue in the base where r=0.14m, residue h=0.3m. Use ($\pi r^2 h$). Site Measured.
		S508 Fibreglass Bunded Condensate Tank		0.02				S508 Flarestack fibreglass (bunded) condy tank. Calc A) vol of COGM condensate in the sealpot where r=0.775m and residue h= 0.02m. Use ($\pi r^2 h$). Site Measured
		Dipleg H2S/HCN Inlet Gas Main		0.01				S701 H_2S/HCN gas main DLSP. Calc A) vol of COGM deposits in the base where r=0.1m, residue h=0.15m. (Use $\pi r^2 h$), B) vol of COGM deposits on the walls where r=0.1m, overflow h=2.57m and wall thickness w=0.005. Use ($2\pi rhw$). Calculate 2nd substance A) vol of COGM condensates in the s/pot where r=0.1m, overflow h=2.575m. (Use $\pi r^2 h$). Site measured
		Dipleg H2S/HCN Inlet Gas Main		0.01				S702 H_2S/HCN gas main DLSP. Calc A) vol of COGM deposits in the base r=0.1m, residue h=0.15m. (Use $\pi r^2 h$), B) vol of COGM deposits on the walls where r=0.1m, overflow h=2.25m and wall thickness w=0.005. Use ($2\pi rhw$). Calculate 2nd substance A) vol of COGM condensates in the s/pot where r=0.1m, overflow h=2.575m. (Use $\pi r^2 h$). Site measured
		Sealpot H2S/HCN Inlet Gas Main		0.01				S703A/B Inlet gas main DLSP. Calc A) vol of COGM deposits in the base where r=0.1m, residue h=0.15m. (Use $\pi r^2 h$), B) vol of COGM deposits on the walls where r=0.1m, overflow h=2.57m and wall thickness w=0.005. Use ($2\pi rhw$). Calculate 2nd substance A) vol of COGM condensates in the s/pot where r=0.1m, overflow h=2.575m. (Use $\pi r^2 h$). Site measured
		Total Naphthalene at RCO		377.95				
	SBCO & Arterial COGM	Exhausters (2)		0.00				Dia 1m.x L 1.5m. a) Historically on inspection the casing & rotor normally c.50% fouled with COG deposits 18/10/2022 - demolished.
		Primary Ammonia Washer		0.00				Dia 3.5m H 30. N2 purged & drained. a) Ctr of base drain 50mm. b) Top of False Btm 200mm. c) 3 x COG hood stage levels 600mm each. 18/10/2022 - demolished.
		Secondary Ammonia Washer		0.00				Dia 5.08m H 42.06. N2 purged & drained. a) Ctr of base drain 500mm. B) Top of False Btm 600mm. c) Single COG hood stage level 600mm 18/10/2022 - demolished.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		No.1 Ammonia Washer		0.00				Dia 4.87m H 42. Out of service c. 1980. N2 purged & drained. Assume same inventory as No 3 Demolished May 2021; inventory stored onsite.
		No.2 Ammonia Washer		0.00				Dia 4.87m H 42. Out of service c. 1980. N2 purged & drained. Assume same inventory as No 3 Demolished May 2021; inventory stored onsite.
		No.3 Ammonia Washer		0.00				Dia 4.87m H 42. Out of service c. 1980. N2 purged & drained. a) Base hatch missing visible depth of material in base 600mm. b) Top of False Btm 600mm. c) single COG hood stage level 600mm Demolished May 2021; inventory stored onsite.
		Primary COG Cooler Downcomer		0.00				Height 19.37m x 0.512 18/10/2022 - demolished.
		Secondary COG Cooler Downcomer		0.00				Height 16.76m x 0.512 18/10/2022 - demolished.
		Primary NH3 Washer Downcomer		0.00				Height 24.48m x 0.512 18/10/2022 - demolished.
		Secondary NH3 Washer Downcomer		0.00				Height 38.45m x 0.512 18/10/2022 - demolished.
		No.1 NH3 Washer Downcomer		0.00				Height 38.41m x 0.512 Demolished May 2021; inventory stored onsite.
		No.2 NH3 Washer Downcomer		0.00				Height 38.41m x 0.512 Demolished May 2021; inventory stored onsite.
		No.3 NH3 Washer Downcomer		0.00				Height 38.41m x 0.512 Demolished May 2021; inventory stored onsite.
		No.1 Benzole Washer Downcomer		0.00				Height 35.70m x 0.512 18/10/2022 - demolished.
		No.2 Benzole Washer Downcomer		0.00				Height 35.70m x 0.512 18/10/2022 - demolished.
		No.3 Benzole Washer Downcomer		0.00				Height 35.70m x 0.512 18/10/2022 - demolished.
		SBCO By-Products COGM		0.00				L 941m x 0.512 Measured on Google Earth; August 2021 - approx. 50% of LP Main cleaned as part of Battery Phase 1 18/10/2022 - demolished.
		Storage Area		92.96				640 205L drums stored onsite.
		RCO/SBCO Arterial COGM		0.00				L 7000m x 0.141 Measured on Google Earth; August 2021 - approx. 16.45% cleaned 04/07/2022 - Altrad estimate 643.75T of COGM deposits remaining, therefore 50% naphthalene. 22/08/2022 - Altrad estimate 380T of COGM deposits remaining, therefore 50% naphthalene. 18/10/2022 - estimated 38T remaining within Section 5, therefore 50% naphthalene. 20/10/2022 - decontamination complete. Material to be removed from site at Altrad Waste Treatment Plant.
		SBCO/TLRS Arterial COGM		0.00				L 1700m x 0.141 Measured on Google Earth; decontaminated Q3-Q4 2020
		Lackenby Arterial COGM		0.00				L 5000m x 0.141 Measured on Google Earth; Phase 1 (BOS-COV-01 - CC-COV-01) decontaminated August 2021 10/06/2022 - decontamination and demolition by KDC complete. 22T of solid wastes removed from site
		RSP/RBF/RPS Arterial COGM		1.00				L 4000m x 0.141 Measured on Google Earth 03/11/2022 - 6T remaining at RSP; Teesworks currently applying water to single section at RPS; estimated IBC's worth present (50% naphthalene). 01/12/2022 - RSP COG quantity now estimated to be less than 1T (50% naphthalene).
		RCO By-Products COGM		142.35				L 639m x 0.384 Measured on Google Earth
		ASUK Waste Treatment Plant		11.62				20/10/2022 - 80 drums stored at ASUK Plant. Assume 50% naphthalene.
		Pactec Bags Storage		71.43				Stored at Iron Gran Plant pending TFS approval. 14/12/2022 - 14.82T removed from site. Assume 50% naphthalene. 31/01/2023 - 14.86T removed from site. Assume 50% naphthalene.
		Total Naphthalene at SBCO & Arterial COGM		319.36				
	Total Naphthalene			**697.31**				**Naphthalene has also been included in the P7 Pyrophoric Liquids and Solids inventory, where it has been assumed that it will account for 50% of the Coke Oven Gas Main deposits. For the purposes of E1 Hazardous to the Aquatic Environment the COGM deposits in m^3 have been reduced by 50% and then coverted to tonnages using a SG of 1.162**
-	**Total E1 Hazardous to Aquatic Environment**		**90**	**813.49**				
E2 Hazardous to the Aquatic Environment in Category Chronic 2								

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
	RCO	1C401 - Benzole Scrubber		47.71			**ABOVE UPPER TIER** The aggregate inventory of E2 Hazardous to the Aquatic Environment is above the upper-tier threshold due principally to the presence of significant coal tack stocks on site.	1C401 scrubber. Calc A) vol in the base. The base is sloped so from average h=0.305m, r=1.98. Use ($\pi r^2 h$) V1= 3.757m³. Calc volume V2 where level =96%of h, h=1.98m, and r= 1.98m. Use 0.96 ($\pi r^2 h$).V2 =23.41m³ Add V1 and V2 for total vol in the base=27.167m³ B) combined vols on the stages, Calc V1 , vol in a stage up to the riser where h=1.12m, r=1.98m. Use ($\pi r^2 h$). V1 =13.749m³. Calculate V2, vol in centre of the gas riser where r=0.99m, and h= 1.12m. Use ($\pi r^2 h$). V2 =3.489m³. Subtract V2 from V1 and divide by 2 to give volume on a tray and multiply by 3 for the number of stages. Total vol on stages = 15.458m³. C) vols on the vessel walls where thicknes = 0.002m, h=30m, and r=1.98m. Use (2πrhw). Vol on walls = 0.746m³
		1C402 - Benzole Scrubber		47.98				1C402 scrubber. Calc A) vol in the base. The base is sloped so from average h=0.305m, r=1.98. Use ($\pi r^2 h$) V1= 3.757m³. Calc volume V2 where level =96%of h, h=1.98m, and r= 1.98m. Use 0.96 ($\pi r^2 h$).V2 =23.41m³ Add V1 and V2 for total vol in the base=27.167m³ B) combined vols on the stages, Calc V1 , vol in a stage up to the riser where h=1.12m, r=1.98m. Use ($\pi r^2 h$). V1 =13.749m³. Calculate V2, vol in centre of the gas riser where r=0.99m, and h= 1.12m. Use ($\pi r^2 h$). V2 =3.489m³. Subtract V2 from V1 and divide by 2 to give volume on a tray and multiply by 3 for the number of stages. Total vol on stages = 15.458m³. C) vols on the vessel walls where thicknes = 0.002m, h=30m, and r=1.98m. Use (2πrhw). Vol on walls = 0.746m³
		2C401 - Benzole Scrubber		47.98				2C401 scrubber. Calc A) vol in the base. The base is sloped so from average h=0.305m, r=1.98. Use ($\pi r^2 h$) V1= 3.757m³. Calc volume V2 where level =96%of h, h=1.98m, and r= 1.98m. Use 0.96 ($\pi r^2 h$).V2 =23.41m³ Add V1 and V2 for total vol in the base=27.167m³ B) combined vols on the stages, Calc V1 , vol in a stage up to the riser where h=1.12m, r=1.98m. Use ($\pi r^2 h$). V1 =13.749m³. Calculate V2, vol in centre of the gas riser where r=0.99m, and h= 1.12m. Use ($\pi r^2 h$). V2 =3.489m³. Subtract V2 from V1 and divide by 2 to give volume on a tray and multiply by 3 for the number of stages. Total vol on stages = 15.458m³. C) vols on the vessel walls where thicknes = 0.002m, h=30m, and r=1.98m. Use (2πrhw). Vol on walls = 0.746m³
		2C402 - Benzole Scrubber		46.37				2C402 scrubber. Calc A) vol in the base. The base is sloped so from average h=0.305m, r=1.98. Use ($\pi r^2 h$) V1= 3.757m³. Calc volume V2 where level =91%of h, h=1.98m, and r= 1.98m. Use 0.91 ($\pi r^2 h$).V2 =22.192m³ Add V1 and V2 for total vol in the base=25.949m³ B) combined vols on the stages, Calc V1 , vol in a stage up to the riser where h=1.12m, r=1.98m. Use ($\pi r^2 h$). V1 =13.749m³. Calculate V2, vol in centre of the gas riser where r=0.99m, and h= 1.12m. Use ($\pi r^2 h$). V2 =3.489m³. Subtract V2 from V1 and divide by 2 to give volume on a tray and multiply by 3 for the number of stages. Total vol on stages = 15.458m³. C) vols on the vessel walls where thicknes = 0.002m, h=30m, and r=1.98m. Use (2πrhw). Vol on walls = 0.746m³
		2C403 - Wash Oil Still		4.35				2C403 still. Calc A) vol in the base where r=1.22m, outlet pipe h =0.15m. Use ($\pi r^2 h$) , B) combined vols on the stages where, r=1.22m and overflow h= 0.05m. Using ($\pi r^2 h$), V1 =0.234m. Calc vol of roser based on r=0.095m and h=0.05m. Using ($\pi r^2 h$), V"= 0.014m. Subtract V2 from V1 so V3=0.22m. Multiply by V3 vol by 14 for the number of trays. , C) vols on the vessel walls where r=1.22m, h=11.062m and thickness on walls w=0.002. Use (2πrhw). Assume that this has not been cleaned as this cannot be determined. Assume same vol as 2C403
		2C404 - Wash Oil Purifier						2C404 purifier was cleaned prior to closure and not put back in service. No contamination expected.
		1C403 - Wash Oil Still		4.35				1C403 still. Calc A) vol in the base where r=1.22m, outlet pipe h =0.15m. Use ($\pi r^2 h$) , B) combined vols on the stages where, r=1.22m and overflow h= 0.05m. Using ($\pi r^2 h$), V1 =0.234m. Calc vol of roser based on r=0.095m and h=0.05m. Using ($\pi r^2 h$), V"= 0.014m. Subtract V2 from V1 so V3=0.22m. Multiply by V3 vol by 14 for the number of trays. , C) vols on the vessel walls where r=1.22m, h=11.062m and thickness on walls w=0.002. Use (2πrhw). Assume that this has not been cleaned as this cannot be determined. Assume same vol as 2C403
		1C404 - Wash Oil Purifier						

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
Benzole Absorbing Oil/Creosote		1T405 - Wash Oil Circulating Tank	45.4	0.00				1T405 Calculate A) vol of BAO and BAO residues in the tank where, horizontal l=7.16m, dia = 2.75m , elipsoidal ends l=0.4m, Use reckoner. B) vol on tank walls where the thickness on walls w = 0.002m, r=1.375m, l of horozontal straight section is 7.16m.Assume the two ends are flat. Use ($2\pi r^2w$) + ($2\pi rlw$). Tank dipped for level - 6' 1" (1.847m) (πr^2h) ($2\pi rhw$) Inventory removed 02/03/2022. Tank decontaminated 05/03/2022.
		2T405 - Wash Oil Circulating Tank	45.5	0.00				2T405 Calculate A) vol of BAO and BAO residues in the tank where, horizontal l=7.16m, dia = 2.75m , elipsoidal ends l=0.4m, Use reckoner. B) vol on tank walls where the thickness on walls w = 0.002m, r=1.375m, l of horozontal straight section is 7.16m.Assume the two ends are flat. Use ($2\pi r^2w$) + ($2\pi rlw$). Tank dipped for level - 5" (0.127m) (πr^2h) ($2\pi rhw$) Inventory removed 25/02/2022. Tank decontaminated 26/02/2022. 06/09/2022 - 3,075L removed from site by MGL.
		0T411 - Rich Creosote Oil Tank	122	0.00				OT411 fresh BAO tank. Calc A) vol in the tank, B Vol on tank walls. Tanked dipped for level. The tank dip is 0.127m or 5". The vol can be taken from the process help for tanks. Given that no drawings are available and the tank is a lot bigger that OT105, assume the vol on the walls is $0.2m^3$. Inventory removed, 28/02/2022. Tank decontaminated 23/02/2022. 06/09/2022 - 3,280L removed from site by MGL.
		Oil/Vapour Heat Exchanger 1E401		1.48				1E401 O/V h/ex. Calc A) vol of BAO in vessel. Calculate 2nd substance A) vol of B/z condensates. Site measured and assumed 50% vol is BAO. Where l=4.876m, and r=0.419m. Use 0.5(πr^2h). This volume will have condensed and be significantly less but this is worst case.
		Oil/Vapour Heat Exchanger 1E402		1.48				1E401 O/V h/ex. Calc A) vol of BAO in vessel. Calculate 2nd substance A) vol of B/z condensates. Site measured and assumed 50% vol is BAO. Where l=4.876m, and r=0.419m. Use 0.5(πr^2h). This volume will have condensed and be significantly less but this is worst case.
		Oil/Vapour Heat Exchanger 2E401		1.48				1E401 O/V h/ex. Calc A) vol of BAO in vessel. Calculate 2nd substance A) vol of B/z condensates. Site measured and assumed 50% vol is BAO. Where l=4.876m, and r=0.419m. Use 0.5(πr^2h). This volume will have condensed and be significantly less but this is worst case.
		Oil/Vapour Heat Exchanger 2E402		1.48				1E401 O/V h/ex. Calc A) vol of BAO in vessel. Calculate 2nd substance A) vol of B/z condensates. Site measured and assumed 50% vol is BAO. Where l=4.876m, and r=0.419m. Use 0.5(πr^2h). This volume will have condensed and be significantly less but this is worst case.
		Rich Oil Heater 2E403		0.30				2E403 ROH. Calc vol of BAO in vessel.where l=2.345m, tube r=0.0126m, and there are 236 tubes. Use 236(πr^2l).
		Rich Oil Heater 2E404		0.30				2E404 ROH. Calc vol of BAO in vessel.where l=2.345m, tube r=0.0126m, and there are 236 tubes. Use 236(πr^2l).
		Oil Cooler Heat Exchanger 2E405 (redundant pre 2010)		0.28				2E405 old redundant S+T H/ex. Calculate A) vol of BAO in the tube bundle. Insufficient detail to assess vol. Drained down. Assume $0.025m^3$ of Bao residue in the h/ex tubes.
		Oil Cooler Heat Exchanger 2E406 (redundant pre 2011)		0.28				2E406 old redundant S+T H/ex. Calculate A) vol of BAO in the tube bundle. Insufficient detail to assess vol. Drained down. Assume $0.025m^3$ of Bao residue in the h/ex tubes.
		Oil Cooler Heat Exchanger 2E407 (redundant pre 2012)		0.28				2E407 old redundant S+T H/ex. Calculate A) vol of BAO in the tube bundle. Insufficient detail to assess vol. Drained down. Assume $0.025m^3$ of Bao residue in the h/ex tubes.
		Oil Cooler Heat Exchanger 2E408 (redundant pre 2013)		0.28				2E408 old redundant S+T H/ex. Calculate A) vol of BAO in the tube bundle. Insufficient detail to assess vol. Drained down. Assume $0.025m^3$ of Bao residue in the h/ex tubes.
		BAO Oil Cooler 1E405		0.77				1E405 new creoste cooler h/ex. Calc A) vol in the BAO side of the h/ex. Vol taken from faceplate
		BAO Oil Cooler 1E406		0.77				1E406 new creoste cooler h/ex. Calc A) vol in the BAO side of the h/ex. Vol taken from faceplate
		Vapour Box 1G402		0.09				1G401 vapor box. Calculate A) vol in the base where r=0.38m, base to outlet pipe h=0.01485m. Use (πr^2h), B) vol on the walls where r=0.38m, h=2.55m Use ($2\pi rhw$).
		Vapour Box 2G402		0.09				2G401 vapor box. Calculate A) vol in the base where r=0.38m, base to outlet pipe h=0.01485m. Use (πr^2h), B) vol on the walls where r=0.38m, h=2.55m Use ($2\pi rhw$).
		Benzole Sump V/V Pit OA401		18.50				OA401 valve pit section. Calc A) vol of BAO residue in the base where, l=7.92m, b=1.18m and residue h = 1.8m. Use (lbh). All BENZOLE SUMP SECTIONS WERE SITE MEASURED
		Benzole North Water Sump		0.05				OA401 valve pit section. Calc A) vol of BAO residue in the base where, l=1.78m, b=2.6m, and residue h = 0.1m. Use (lbh). Calculate 2nd substance A) vol of contaminated rainwater water. The contaminated rainwater level varies rain and transfers. Max 13.0
		Benzole South Water Sump OA401A N		0.05				OA401 valve pit section. Calc A) vol of BAO residue in the base where, l=1.78m, b=2.6m, and residue h = 0.1m. Use (lbh). Calculate 2nd substance A) vol of contaminated rainwater water. The contaminated rainwater level varies rain and transfers. Max 13.0

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Benzole North Oil Sump OA401B N		0.03				OA401 valve pit section. Calc A) vol of BAO residue in the base. Calculate 2nd substance A) vol of Benzole and water. (**ASSUME BENZOLE FOR WORST CASE SCENARIO UNTIL THE SPLIT IS QUANTIFIED**). Calc vol of residues in the base where, l=1.78m, b=2.6m, and residue h = 0.06. Use (lbh)
		Benzole South Oil Sump OA401B S		0.10				OA401 valve pit section. Calc A) vol of BAO residue in the base where, l=1.78m, b=2.6m, and residue h = 0.02. Use (lbh). Calculate 2nd substance A) vol of Benzole and water. (**ASSUME BENZOLE FOR WORST CASE SCENARIO UNTIL THE SPLIT IS QUANTIFIED**)
		Oil Sump OA402		1.59				OA402 BAO sump. Calc A) vol of BAO in the sump, where l=2.75m, b=1.42m and BAO h=0.37m.Use (lbh) . (INFO depth of sump =2.64m) so max vol =10.31m. Site measured
		Oil to Oil Heat Exchanger 1E414		4.47				1E414 o/o h/ex. Calc A) oil vol in H/ex given r=0.875m and l=1.8m. Use ($\pi r^2 l$).
		Oil to Oil Heat Exchanger 2E414		4.47				2E414 o/o h/ex. Calc A) oil vol in H/ex given r=0.875m and l=1.8m. Use ($\pi r^2 l$).
		BAO (Creosote) Pipework Volume		23.18				Creosote pipe work BAO. Calc A) vol in the BAO pipework. Calculations were carried out when the plant went of for refurbs in 2014.
		Total BAO at RCO	**345**	**260.50**				
	SBCO	DB oil buffer pump surge tank	9					
		East DB oil recirculating tank	44					
		West DB oil recirculating tank	44					
		No.1 Benzole Scrubber		0.00				Dia 4.9m H 38.7m. Taken out of service c.2014. N2 purged & drained. Inventory based on previous work on Bz washers. a) Base depth 1m. b) Top of False Btm 300mm. c) 9 x distribution grids 50mm. d) 2mm film on shell
		No.2 Benzole Scrubber		0.00				Dia 4.9m H 38.7m. Taken out of service c.2014. N2 purged & drained. Inventory based on previous work on Bz washers. a) Base depth 1m. b) Top of False Btm 300mm. c) 9 x distribution grids 50mm. d) 2mm film on shell
		No.3 Benzole Scrubber		0.00				Dia 4.9m H 38.7m. Taken out of service c.2014. N2 purged & drained. Inventory based on previous work on Bz washers. a) Base depth 1m. b) Top of False Btm 300mm. c) 9 x distribution grids 50mm. d) 2mm film on shell 18/10/2022 - demolished.
		Benzole Distillation Column		0.00				Dia 1.46 x H 9.30. Vessel drained & steamed out after cessation of operations. Height of base from drain 140mm. 18/10/2022 - demolished.
		Benzole Make Tank South		0.00				Dia 2.75 x L 6.10. Tank modified to BAO pump tank. Inventory pumped to below suction to the East DB Oil recirc tank after cessation of operations. Suction pipe located on base of tank. Est .02 of DB Oil remaining B) 2mm film on tank wall 18/10/2022 - demolished.
		Benzole Phlegm Oil Tank		0.00				Dia .3m H 1.5m. Tank drained & steamed out after cessation of operations drained. 2mm film on tank wall 18/10/2022 - demolished.
		Benzole Oil Buffer Tank		0.00				Dia 1.8m H 4.75m. Out of service prior to cessation of operations. Tank dipped. 0.5m level in tank. 2mm film on tank wall 18/10/2022 - demolished.
		Benzole Oil/Water Reclaim Tank		0.00				Dia 1.5m x L 3m. Out of service c. 1985. Base drain opened. 2mm film on tank wall 18/10/2022 - demolished.
		East Debenzolised Oil Tank		0.00				Dia 2.74m x L 9.1m. Tank dipped 1.5. 2mm film on tank wall 18/10/2022 - demolished.
		West Debenzolised Oil Tank		0.00				Dia 2.74m x L 9.1m. Tank dipped 1.5. 2mm film on tank wall 18/10/2022 - demolished.
		Benzole Rich Oil Heater 3		0.00				Dia 1.16m x L 9.14m. X 301 x 0.038 dia tubes. Vessel drained & steamed out after cessation of operations. 2mm film on tube walls. 18/10/2022 - demolished.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Benzole Rich Oil Heater 4		0.00				Dia 1.16m x L 9.14m. X 301 x 0.038 dia tubes. Vessel drained & steamed out after cessation of operations. 2mm film on tube walls 18/10/2022 - demolished.
		Benzole Oil/Oil Heat Exchangers (13 off)		0.00				Dia 0.304mx L 4.87m. X 19 x 0.020 dia tubes. Vessel drained & steamed out after cessation of operations. 2mm film on tube walls 18/10/2022 - demolished.
		Benzole Regen Vessel		0.00				Dia 0.71m x L 2.10m. X 139 x 0.038 dia tubes. Vessel drained & steamed out after cessation of operations. 2mm film on tube walls 18/10/2022 - demolished.
		Benzole Oil Plate Coolers (2)		0.00				H 1.5m x D x 0.100m x W 1m x 60 Titanium plates. Unit drained & steamed out after cessation of operations. 2mm film on plates 18/10/2022 - demolished.
		Storage Area		0.00				18/10/2022 - 86 closed IBCs stored onsite (59 from washers; 27 from DB oil tank pit). 22/12/2022 - see individual pit entries for storage details.
		Benzole Spiral Oil Cooler		0.00				H 1.5m x D x 0.100m x W 1m x 60 Titanium plates. Unit drained & steamed out after cessation of operations. 2mm film on plates 18/10/2022 - demolished.
		Benzole Plant Drains Pit		0.00				Concrete sump L 20m x W 7m x H 4 Sump dipped .5m BAO + 2m Effluent 14/12/2022 - pit 90% clean. 21 IBCs stored onsite. 22/12/2022 - 21 open-topped IBCs stored onsite. 11/01/2023 - pit 100% clean. 24 open-topped IBCs stored onsite. 31/01/2023 - all IBCs removed from site.
		Debenzolised Oil Tank Pit		0.00				Concrete sump L 12m x W 9m x H 1.5 Sump dipped 0.2m BAO + 1m Effluent [Contaminated rainwater] 14/12/2022 - pit 100% clean, 27 IBCs stored onsite. 22/12/2022 - 0 IBC stored onsite.
		Effluent Pit		11.00				Concrete sump L 10m x W 10 m x H 4m Sump dipped .1 BAO + 1m water [Contaminated rainwater + BAO] 14/12/2022 - pit 70% clean. 9 open-topped IBCs and 59 closed IBCs stored onsite. 22/12/2022 - pit 80% clean. 58 closed IBCs stored onsite. 11/01/2023 - pit 95% clean. 102 closed IBCs stored onsite.
		West Interceptor		26.40				Concrete sump L 6.m x W 2m x H 4m Dipped 2m Tar 1.1 water 14/12/2022 - pit 100% clean. 41 open-topped IBCs stored onsite. 22/12/2022 - 21 open-topped IBCs stored onsite. 11/01/2023 - 20 open-topped IBCs stored onsite.
		Total BAO at SBCO	**97**	**37.40**				
	Total Benzole Absorbing Oil/Creosote		**442**	**297.90**				
	SBCO	Tar make pump tank	40	0.00				Dia 2m x L 6.5m. Drained. a) Top hatch removed depth of material 0.300mm. b) 2mm film on tank wall. 18/10/2022 - demolished.
		North Storage / Export loading tank	150	0.00				Dia 4.02 x H 10.23 Drained from base of cone. a) Using the Virgin tank as a guide to estimate solid deposits on the incline of the elevated base cone. B) 2mm film on tank wall. 18/10/2022 - demolished.
		South Storage / Export loading tank	150	0.00				Dia 4.02 x H 10.23 Drained from base of cone. a) Using the Virgin tank as a guide to estimate solid deposits on the incline of the elevated base cone. B) 2mm film on tank wall. 18/10/2022 - demolished.
		Strong liquor tank No. 1	1000					
		Strong liquor tank No. 2	1000					
		Strong liquor tank No. 3	1000					
		Strong liquor tank No. 4	1000					
		Effluent Tank No.1		0.00				Dia 11m x H 11m. 5mm holes drilled & sealed above free space to establish level = a) 1.28m.b) 2mm film on tank wall x 2m 28/02/2022 - approx. 173T removed and decanted into drums/IBCs. Still onsite. 10/06/2022 - 130.64T removed.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Effluent Tank No.2		0.00				Dia 11m x H 11m. 5mm holes drilled & sealed above free space to establish level = a) 1.50m. b) 2mm film on tank wall x 2m 10/06/2022 - 97.2T removed.
		Effluent Tank No.3		0.00				Dia 11m x H 11m. 5mm holes drilled & sealed above free space to establish level = a) 1.35m. b) 2mm film on tank wall x 2m 28/02/2022 - approx. 150T removed and decanted into drums/IBCs. Still onsite. 10/06/2022 - 184.46T removed.
		Effluent Tank No.4 - contents removed from tank as part of Decontamination Project		0.00				Dia 11m x H 11m. 5mm holes drilled & sealed above free space to establish level = 1.11m. 09/2019 inventory removed via vac tanker & transfered into mobile storage tanks on site awaiting off site disposal tank cleaned to EU 27 standard 28/02/2022 - inventory removed from site Oct/Nov 2021 along with contents of Benzole Storage Tank.
		No.1 Liquor Pump Tank		0.00				Dia 6m x H 2.3m. Drained. a) Base hatch removed depth of material 0.050mm. b) 2mm film on tank wall. 10/06/2022 - 20.26T removed.
		No.2 Liquor Pump Tank		0.00				Dia 6m x H 2.3m. Drained. a) Base hatch removed depth of material 0.050mm. b) 2mm film on tank wall. 10/06/2022 - 23.12T removed.
		Tar/liquor Decanter "A"	175	0.00				L 14.7 x W 4.51 x H 2.90. Drained. a) Ctr of base drain 175mm. b) 2mm film on tank wall 10/06/2022 - 45.32T removed.
		Tar/liquor Decanter "B"	175	0.00				L 14.7 x W 4.51 x H 2.90. Drained. a) Ctr of base drain 175mm. b) 2mm film on tank wall 10/06/2022 - 27.8T removed. 68.86T also removed from decanter tanks drainage sump and pipework.
		East Low Level Pond	138	25.79				Concrete sump L 11.58m x W 3.2m x H 2.28. Sump dipped Tar 0.6 water 2 14/12/2022 - pond 100% clean. 34 open-topped IBCs and 17 closed IBCs stored onsite. 22/12/2022 - 35 open-topped IBCs stored onsite. 11/01/2023 - 6 open-topped IBCs stored onsite.
		West Low Level Pond	138	0.00				Concrete sump L 11.58m x W 3.2m x H 2.28. Sump dipped Tar 2 water 0.5 14/12/2022 - pond 100% clean. 91 open-topped IBCs and 2 closed IBCs stored onsite. 22/12/2022 - 35 open-topped IBCs stored onsite. 11/01/2023 - 3 open-topped IBCs stored onsite. 31/01/2023 - all IBCs removed from site.
		Primary Naphtha Pit		26.10				Concrete sump L 15m x W15 m x H 4m Sump dipped .1m Tar + 1m water [Contaminated rainwater + Tar from sec cooler 22/12/2022 - pit 100% clean. 70 open-topped IBCs and 24 closed IBCs stored onsite. 11/01/2023 - 91 open-topped IBCs and 24 closed IBCs stored onsite.
		West Interceptor Pit	20					
		Primary Cooler		0.00				Dia 3.8m H x 24m. N2 purged & drained. a) Centre of base drain 125mm. b)Top of False Btm 200mm. c) 5mm film on COG distribution grids x 4. d) 2mm film on shell [24 x11.93 x 2] 18/10/2022 - demolished.
		Primary Cooler Sump	5	1.39				Concrete sump L 3m x 2m x W 2m .2 tar + .9 water 14/12/2022 - sump 100% clean. 11 open-topped IBCs stored onsite.
		Secondary Cooler		0.00				Dia 4.11 H 21.33. Out of service 2014 for structural repairs. Not recommissioned. Base and top of false bottom cleaned to make safe for hotworks. a) Mid section depth to overflow 300mm. B) 2mm film on shell 18/10/2022 - demolished.
		Secondary Cooler Sump (East Interceptor Pit)	20	0.00				Concrete sump L 4.7m x W 2m x H 4m. Dipped 0.1 Tar 2m water 14/12/2022 - pit 100% clean. 14 open-topped IBCs stored onsite. 11/01/2023 - 16 open-topped IBCs stored onsite. 31/01/2023 - all IBCs removed from site.
		L Tank	1000	0.00				Dia 11m x H 11m. 5mm holes drilled & sealed above free space to establish level = a) 1.60m.B) 2mm film on tank wall. 01/07/2022 - tank demolished. Inventory being removed to Port Talbot.
		M Tank	1000	0.00				Dia 11m x H 11m. 5mm holes drilled & sealed above free space to establish level = a) 1.30m. B) 2mm film on tank wall. 01/07/2022 - tank demolished. Inventory being removed to Port Talbot.
		Virgin Liquor Tank		0.00				Dia 9.75 x H 13.43 Drained from base of cone. a) Cone hatch cover removed solid carbon deposits & scale visible on sides of cone. B) 2mm film on tank wall. 18/10/2022 - demolished.
		Old Decant Tank (N Tank)	800	0.00				Dia 5m x H 10m. Drained from base of cone. a) Using the Virgin tank as a guide to estimate solid deposits on the incline of the elevated base cone. B) 2mm film on tank wall. 18/10/2022 - demolished.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		COGM Condensate Pots (15)		0.00				Dia 1m x L 1.5 x 15 Seal pots are drained on weekly frequence with vac tanker and transported to RCO for storage. 2mm film on shell 18/10/2022 - demolished.
		Primary Heat Exchangers (8)		0.00				Dia 1.2mx L 9m. X 456 x 0.025 dia tubes. Vessel drained & steamed out. 8 x Heat exchangers. 2mm film on tubes 18/10/2022 - demolished.
		Sec. Cooler Heat Exchanger		0.00				Sec COG cooler out of service 2014 for structural repairs. Not recommissioned.1 x Heat exchanger Dia 0.937mx L 4.20m. X 456 x 0.025 dia tubes. Vessel drained & steamed out. 2mm film on tubes 18/10/2022 - demolished.
		Tar Pump House Sump		0.00				Concrete sump L 2m x W 2m x H 1.5 m Sump dipped .1m tar + 1.4m water [Contaminated rainwater + Tar]
		Ex & Sec Cooler Tank Drains (2)		0.00				Steel tanks located within a concrete gulley L 1.5m x W 1m D x 1m Dipped .8 Tar .2 water 14/12/2022 - drains 100% clean.
		Gullies		435.00				Gullies estimate based on: L 2000m x W1m x D 0.75m = 1500m3. Split = 25% Tar residue + 75% Contaminated Rain Water 14/12/2022 - gullies 90% clean. 293 open-topped IBCs stored onsite. 22/12/2022 - gullies 95% clean. 175 open-topped IBCs stored onsite. 11/01/2022 - gullies 100% clean. 143 open-topped IBCs stored onsite.
		On ground (tar/coal mix)	N/A	0.00				Google Earth images and drone flight picture shows voids + irregular shape of the stockpile c. L 75m x 20 to 26 W x H 3m. If this was squared up it would reduce the volume to c. L 20m x W 50m x H 3m. July 2021 - 47.84T removed by Keltbray for sampling/testing. 06/01/2022 - 478.1T removed by 22/12/2021 to Port Talbot for re-use. 01/03/2022 - 1615.12T now offsite in total. 04/04/2022 - 1815.46T now offsite in total. 10/06/2022 - 2860.72T now offsite in total. Removal complete but note creation of second pile from remaining tar tanks.
		Storage Area		0.00				Stored in IBCs and drums. 22/12/2022 - see individual pits/sumps/gullies for storage details.
		Total Coal Tar SBCO	**7,811**	**488.28**				
	RCO	OT104A - Tar Receiving Tank	28.5					
		OT104B - Tar Receiving Tank	28.5					
		1T106 - Tar Storage Tank	570	270.69				Calculate A) tar volume max above DP cell from tank level 100 %, and from this tar volume from tank %, B) calculate tar volume below the DP cellin the base, C) tar on the decanter walls. r=4.53m, tank overflow h = 8.85m, tar level =46% from DP cell. Add volume under DP cell. DP cell h =0.25m. Assume tar thickness on walls = 0.005m 01/12/2022 - inventory removal has been progressed. Material being removed from site with heel to be tackled. 14/12/2022 - 19 IBCs removed from site. 21/12/2022 - 25.38T (24 IBCs) removed from site.
		1T107 - Tar Storage Tank	570	232.73				Calculate A) tar volume max above DP cell from tank level 100 %, and from this tar volume from tank %, B) calculate tar volume below the DP cellin the base, C) tar on the decanter walls. r=4.53m, tank overflow h = 8.85m, tar level =48% from DP cell. Add volume under DP cell. DP cell h =0.25m. Assume tar thickness on walls = 0.005m 01/12/2022 - inventory removal has been progressed. Material being removed from site with heel to be tackled. 14/12/2022 - 65 IBCs removed from site. 11/01/2023 - 12 IBCs removed before Christmas 2022. 16/01/2023 - 77 IBCs now removed in total.
		2T106 - Tar Storage Tank	570	127.46				Calculate A) tar volume max above DP cell from tank level 100 %, and from this tar volume from tank %, B) calculate tar volume below the DP cellin the base, C) tar on the decanter walls. r=4.53m, tank overflow h = 8.85m, tar level =48% from DP cell. Add volume under DP cell. DP cell h =0.25m. Assume tar thickness on walls = 0.005m 04/08/2022 - 57 IBCs of tarry liquor generated. 01/12/2022 - inventory removal has been progressed. Material being removed from site with heel to be tackled. 14/12/2022 - 67 IBCs removed from site. 16/01/2023 - Further 10 IBCs removed; now 77 in total.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		2T107 - Tar Storage Tank	570	98.35				Calculate A) tar volume max above DP cell from tank level 100 %, and from this tar volume from tank %, B) calculate tar volume below the DP cellin the base, C) tar on the decanter walls. r=4.53m, tank overflow h = 8.85m, tar level =36% from DP cell. Add volume under DP cell. DP cell h =0.25m. Assume tar thickness on walls = 0.005m 04/08/2022 - 26 IBCs of liquor (mix of tars and possibly ammonia liquor) generated. 01/12/2022 - inventory removal has been progressed. Material being removed from site with heel to be tackled. 14/12/2022 - 85 IBCs removed from site. 21/12/2022 - 25.84T (24 IBCs) 11/01/2023 - 36 IBCs removed before Christmas 2022.
		OT109 - Redundant Tar Decanting Tank	Not known in 2015	98.89				OT109 tar decanter tank redundant since pre 1999. Calc A) volume of tar in the cone where h=2.8m, r=4.5m. Use ($\pi r^2 h/3$). Site measured for dips, B) vol tar above cone where h=0.67m and r=4.5m. Use ($\pi r^2 h$) .Site measured for dips, C) the tar on the shell walls where h=8.33m, and r=4.5m and the thickness of tar on the walls = 0.005m Use ($2\pi rhw$) .Site measured for dips. Calculate 2nd substance A) vol of oil CW above the tar level where, h=0.75m and r=4.5m. Use ($\pi r^2 h$). Site measured for dips.
		IBC's - Horse shoe						
		Lime sump	Not known in 2015	2.68				OA301 lime sump. Calc A) max vol of CRW in the in the 3 section before the pumping section. Calc vol in the rectangulaur pats of the x3 sections where l=21.48m, b=5.16m and h=4.425m. Use (lbh) Calc vol in the sloping section of the x3 bays where l=21.48m, b=5.16m and h= 0.35m. Use (lbh/2) Add both totals together. B) Max vol CRW in the pumping section where, l=4.7m. b=1.32m and h= 1.5m. Use (lbh). Calculate 2nd substance A) vol of tar in inlet channel where l= 21.98m, b=0.35m and h=0.3m. Use (lbh). Site measured.
		1T103A - Tar & Liquor Decanter	Not known in 2015	67.93				Calculate A) tar in the base, B) tar on the decanter walls (one is diagonal), C) tar vol in the chute. Tar level in the base h= 0.61m, l =10.363m, b =3.657m, h side wall =2.743m, h diagonal wall = 4.83m Assume 0.015m tar thickness on walls. Incude sloping wall and chute. See JMG calcs.Tank dipped.
		1T103B - Tar & Liquor Decanter	Not known in 2015	89.05				Calculate A) tar in the base, B) tar on the decanter walls (one is diagonal), C) tar vol in the chute. Tar level in the base h= 1.83m, l =10.363m, b =3.657m, h sidewalls =2.743m, h diagonal wall = 4.83m Assume 0.015m tar thickness on walls. Incude sloping wall and chute. See JMG calcs. Tank dipped.
		1T113 - Tar & Liquor Decanter	Not known in 2015	180.98	**200**	**500**		Calculate A) tar in the base and chute, B) tar on the decanter walls (one is diagonal). Tar level in the base h= 1.82m, l =13.252m, b =4.48m, h diagonal wall length z= 3.935m Calc vol in rectangular base section. Use (lbh). Calc vol on diagonal chute where l=1.82m and h =1.82 and b=4.48m. Use (2lbh/2) Where the wall height above the tar level h= 1.48m, l =13.252m, b =4.48m, Calc A1 the area of the rectangular side walls x2. Use (2lh). Calc A2 the area of the rectangular end wall. Use (bh). Calc A3 the area of the chute walls x2, where l=3.35m and h=3.363m Use (2lh/2). Calc A4 the area of the chute diagonal end wall where diagonal wall length l=3.935m and b= 4.48. Use (lb) Add areas A1+A2+A3+A4= total area Multiply the total area by the wall tar thickness w= 0.015m to give the total tar vol on the walls. Calculate 2nd substance A) vol of tarry oil mixture in the base rectangle above the tar and chute diagonal. Where tarry liquor h= 0.46m, l= (13.252+1.82)=15.072m and b=4.48m Calc vol of tarry oil mixture in the base rectangle above the tar level. Use (lbh) Calc vol of tarry oil in the diagonal chute section. where h=1=0.46, l=0.46m and b=4.48m. Use (2lbh/2). Add the two volumes for the total vol of tarry oil mixture. 14/12/2022 - inventory removal being progressed.
		2T103A - Tar & Liquor Decanter	Not known in 2015	36.62				Calculate A) tar in the base, B) tar on the decanter walls (one is diagonal), C) tar vol in the chute. Tar level in the base h= 0.61m, l =10.363m, b =3.657m, h side walls =2.743m, h diagonal walls = 4.83m Assume 0.015m tar thickness on walls. Incude sloping wall and chute. See JMG calcs. Tank dipped.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		2T103B - Tar & Liquor Decanter	Not known in 2015	29.67				Calculate A) tar in the base, B) tar on the decanter walls (one is diagonal), C) tar vol in the chute. Tar level in the base h= 0.61m, l =10.363m, b =3.657m, h side walls =2.743m, H diagonal wall = 4.83m Assume 0.015m tar thickness on walls. Incude sloping wall and chute. See JMG calcs. Tank dipped.
		2T113 - Tar & Liqour Decanter	Not known in 2015	27.61				Calculate A) tar in the base, tar level in the base h= 0.36m, l =13.252m, b =4.48m, Calc vol in rectangular base section. Use (lbh). Calc vol on diagonal chute where l=0.36m and h =0.36 and b=4.48m. Use (2lbh/2) B) tar on the decanter walls (one is diagonal). Where height above the tar level h= 2.94m, l =13.252m, b =4.48m, Calc A1 the area of the rectangular side walls x2. Use (2lh). Calc A2 the area of the rectangular end wall. Use (bh). Calc A3 the area of the chute walls x2, where l=3.35m and h=3.363m Use (2lh/2). Calc A4 the area of the chute diagonal end wall where diagonal wall length l=3.935m and b= 4.48. Use (lb) Add areas A1+A2+A3+A4= total area Multiply the total area by the wall tar thickness w= 0.015m to give the total tar vol on the walls. C) tar vol in the chute. Where contaminated rain water height above the tar h= 1.87m, l= (13.252+0.36m)=13.612m and b=4.48m Calc vol of Contaminated rainwater (CRW)in the base rectangle above the tar level Use (lbh) Calc vol of tarry oil in the diagonal chute section. where h=1=1.87m, l=1.87m and b=4.48m. Use Sue (2lbh/2). Add the two volumes for the total vol of CRW. 01/12/2022 - inventory removal being progressed.
		2T410 Virgin	Not known in 2015	0.00				2T410 b/z storage tank. Calc A) vol in the tank base. The tank has been emptied of liquor after closure. 7% tar level remained, The bottom inst level z= 0.15m, tank height h_1=7.935m, r=4.375m. The tar level in the base $h_2 = 0.07(h_1-z) + z$. To calc the tar vol in the base use ($\pi r^2 h_2$). **B) vol on the tank walls.** Calc the tar volume on the walls where tank depth above the tar is h=7.24m, r=4.375m,and the thickness on the walls w =0.002m. Use (2πrhw). 14/11/2022 - demolished; inventory removed from site by Acumen (205L drums)
		OT412	Not known in 2015	0.00				OT412 sludge tank. Calc A) vol in the tank base where l=4m, b=3m and h of tar pitch =0.94m. Use (lbh). (INFO - tank depth =3m), B) vol on the tank walls where h=2.06m, l=4m,b=3m, and tar pitch thickness on the walls =0.025m. Use 2(b+l)hw. Tank dipped for level. Tank emptied April 2022 06/09/2022 - 11,685L removed from site by MGL.
		1T301 base	Not known in 2015	113.78				1T301 was drained of liquor after closure. The bottom 1m of tank was cold due to tar when operational.Calculate A) vol of tar in the tank base where r=5.572m, and tar h = 1ml. Use ($\pi r^2 h$), B) vol of tar on the tank walls where r=5.572m, h = 7.875m above the tar level, and thickness on wallls w=0.002m. Use (2πrhw).
		2T301 base	Not known in 2015	44.81				2T301 was drained of liquor after taking O.O.S. The tank was dipped from the top. Calculate A) vol of tar in the tank base where r=5.572m, and tar h = 0.39m. Use ($\pi r^2 h$), B) vol of tar on the tank walls where r=5.572m, h = 7.875m above the tar level, and thickness on wallls w=0.002m. Use (2πrhw).
		2C304 reaction zone	Not known in 2015	11.47				2C304 F+F still. Calc A) vol on fixed still trays where, the overflow risers h= 0.103m, r= 0.8m and there are 8 trays total. Use ($8\pi r^2 h$), B) vol in fixed still base, where the drain height h= 0.075m and r= 0.8m. and there are 8 trays total. Use ($\pi r^2 h$) C) vol on fixed still walls, where h=4.488m,r=0.8, anthickness on the walls w = 0.02m. Use (2πrhw). D) vol on free still trays and walls, where the overflow risers h= 0.103m, r= 0.8m and there are 8 trays total. Use ($8\pi r^2 h$) E) vol in free still base where the height to the steam section is h= 2.225m and r= 0.8m. Use($\pi r^2 h$).Then calcullate the volume of the cone where h=0.725m. Use ($\pi r^2 h/3$). Then add the two totals to give total vol in this base. F) vol on free still walls, where h=4.01m, r=0.8, and the thickness on the walls w = 0.02m. Use (2πrhw).
		OT105 base	Not known in 2015	15.64				Tank taken out of service circa 2019 due to a leak just above the base. Tank plugged. Calc A) tar in the base, B) tar on the walls. Tar drain h = 0.2375m, r =4.24m, h overflow =9.1m, assume tar thickness on walls 0.005m. Tank emptied to the drain level.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
Coal Tar		OT112 base	Not known in 2015	67.21				Tank taken out of service circa 2017 due to leaks. Calc A) tar in the base, B) tar on the walls. Tar h = 0.6m, r =5.5m, h overflow =5.35m, assume tar thickness on walls 0.005m. Tank emptied to upper suction pipe level.
		OT104 f liq tank base	Not known in 2015					
		OT111 f liq tank base	Not known in 2015					
		1C401 base	Not known in 2015					
		1C402 base	Not known in 2015					
		2C401 base	Not known in 2015					
		2C402 base	Not known in 2015					
		1C301	Not known in 2015	15.39				1C301 washer. Calculate A) tar vol in the vessel base tank base where r=1.83m, base h=0.4. Use $\pi r^2 h$. The tar level is based on previous entries. B) tar vol on the x3 upper stages. Use Use $\pi r^2 h$ where r= 1.83m and h =0.4m to the overflowdowncomer.Calculate the volume of the x4 gas risers at h=0.4m, r=0.533m. Use ($4\pi r^2 h$) Subtract the riser volume from the stage volume and multiply by x3 (stages) to give total volume on the stages. C) tar vol on the walls of the washers where h = 31.2m, r=1.83m and thickness on walls w= 0.002m Use ($2\pi rhw$)
		1C302	Not known in 2015	12.06				1C302 washer. Calculate A) tar vol in the vessel base tank base where r=1.83m, base h=0.4m. Use ($\pi r^2 h$). The tar level is based on previous entries. B) tar vol on the x2 upper stages. Use $\pi r^2 h$ where r= 1.83m and h =0.4m to the overflowdowncomer.Calculate the volume of the x4 gas risers at h=0.4m, r=0.533m. Use ($4\pi r^2 h$). Subtract the riser volume from the stage volume and multiply by x2 (stages) to give total volume on the stages. C) tar vol on the walls of the washers where h = 27.4m, r=1.83m and thickness on walls w= 0.002m Use ($2\pi rhw$)
		2C301	Not known in 2015	15.39				2C301 washer. Calculate A) tar vol in the vessel base tank base where r=1.83m, base h=0.4. Use $\pi r^2 h$. The tar level is based on previous entries. B) tar vol on the x3 upper stages. Use Use $\pi r^2 h$ where r= 1.83m and h =0.4m to the overflowdowncomer.Calculate the volume of the x4 gas risers at h=0.4m, r=0.533m. Use ($4\pi r^2 h$) Subtract the riser volume from the stage volume and multiply by x3 (stages) to give total volume on the stages. C) tar vol on the walls of the washers where h = 31.2m, r=1.83m and thickness on walls w= 0.002m Use ($2\pi rhw$)
		2C302	Not known in 2015	12.06				2C302 washer. Calculate A) tar vol in the vessel base tank base where r=1.83m, base h=0.4m. Use ($\pi r^2 h$). The tar level is based on previous entries. B) tar vol on the x2 upper stages. Use $\pi r^2 h$ where r= 1.83m and h =0.4m to the overflowdowncomer.Calculate the volume of the x4 gas risers at h=0.4m, r=0.533m. Use ($4\pi r^2 h$). Subtract the riser volume from the stage volume and multiply by x2 (stages) to give total volume on the stages. C) tar vol on the walls of the washers where h = 27.4m, r=1.83m and thickness on walls w= 0.002m Use ($2\pi rhw$)
		1C201	Not known in 2015					
		2C201	Not known in 2015					
		OT304	Not known in 2015					
		Number 1 BET Bay	Not known in 2015					Demolished.
		Number 2 BET Bay	Not known in 2015					Demolished.
		Number 3 BET Bay	Not known in 2015	57.97				OA305C BET bay No3. Calc A) the max vol of tar contaminated deactivated sludge CRW where l=12.8m, b=12.8m and H = 0.305m. USE (lbh). Calculate 2nd substance A) vol of just deactivated sludge where l=12.8m, b=12.8m and level above bottom layer h =0.545m. USE (lbh). 04/08/2022 - approx. 70m^3 removed. In Acumen waste storage area.
		Number 4 BET Bay	Not known in 2015					Demolished.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Butane tank 1	Not known in 2015	0.00				Calc A) volume of mixed tar and COGM deposits where, l=16.76m, dia =3.05m. h= varies Total tank h= 0.635m. Use crown oil environmental calc. See COMAH/haz sub database. Site measured. Calculate 2nd substance, B) volume of COGM condensate. Horizontal tank with ellipsoidal ends where l=16.76m, dia =3.05m. h= varies. Use crown oil environmental calc. See COMAH/haz sub database. Site measured. 01/07/2022 - tank demolition in progress. Inventory decanted into IBCs and being removed from site.
		Butane tank 2	Not known in 2015	0.00				Calc A) volume of mixed tar and COGM deposits where, l=16.76m, dia =3.05m. h= varies Total tank h= 3.05m. Use crown oil environmental calc. See COMAH/haz sub database. Site measured. Calculate 2nd substance, B) volume of COGM condensate. Horizontal tank with ellipsoidal ends where, l=16.76m, dia =3.05m. h= varies. Use crown oil environmental calc. See COMAH/haz sub database. Site measured. 01/07/2022 - tank demolition in progress. Inventory decanted into IBCs and being removed from site.
		Butane tank 3	Not known in 2015	0.00				Calc A) volume of mixed tar and COGM deposits where, l=16.76m, dia =3.05m. h= varies Total tank h= 3.05m. Use crown oil environmental calc. See COMAH/haz sub database. Site measured. Calculate 2nd substance, B) volume of COGM condensate. Horizontal tank with ellipsoidal ends where l=16.76m, dia =3.05m. h= varies. Use crown oil environmental calc. See COMAH/haz sub database. Site measured. 01/07/2022 - tank demolition in progress. Inventory decanted into IBCs and being removed from site.
		Butane tank 4	Not known in 2015	0.00				Calc A) volume of mixed tar and COGM deposits. Calculate 2nd substance where l=16.76m, dia =3.05m. h= varies Total tank h= 0.27m. Use crown oil environmental calc. See COMAH/haz sub database. Site measured., B) volume of COGM condensate. Horizontal tank with ellipsoidal ends where, l=16.76m, dia =3.05m. h= varies. Use crown oil environmental calc. See COMAH/haz sub database. Site measured. 01/07/2022 - tank demolition in progress. Inventory decanted into IBCs and being removed from site.
		Tar & Liquor Downcomer 1T101		0.28				Vessel blanked at the Gas/liquor inlet and base. Vessel under a N_2 blanket. Calcs, A) tar on the cone walls where, r=0.915m, wall thickness w=0.005m, h=1.77 To Calculate the length of of a cone Use ($l^2=h^2-r^2$) then (vl) . Then use (πrlw), B) tar volume under the cone where, r=0.25m, h=0.25m. Use (πr^2h), C) tar on walls above the cone where, r=0.915m, wall thickness w=0.005m, h=5.8m Use ($2\pi rhw$). Assume a 5mm film on the walls.
		Tar & Liquor Downcomer 2T101		0.28				Vessel blanked at the Gas/liquor inlet and base. Vessel under a N_2 blanket. Calcs, A) tar on the cone walls where, r=0.915m, wall thickness w=0.005m, h=1.77 To Calculate the length of of a cone Use ($l^2=h^2-r^2$) then (vl) . Then use (πrlw), B) tar volume under the cone where, r=0.25m, h=0.25m. Use (πr^2h), C) tar on walls above the cone where, r=0.915m, wall thickness w=0.005m, h=5.8m Use ($2\pi rhw$). Assume a 5mm film on the walls.
		Primary Cooler 1C101		8.90				Vessel drained and on a N_2 blanket. Calcs, A) tar in the base base where r = 1.83m and h =assumed 0.3m (drain height x2). B) tar on the top stage where r=1.83m, deduct area of x4 gas ports, r= 0.533m, h= level to chinamans hats 0.45m, calc volume, C) tar on the vessel walls where r=1.83m, h= 24m, D) tar on false bottom where πr^2h where r = 1.83m and h =0.005m tar thickness. Assume a 5mm tar film on the walls. Operating inlet gas temp 80C
		Primary Cooler 1C102		8.90				Vessel drained and on a N_2 blanket. Calcs, A) tar in the base base where r = 1.83m and h =assumed 0.3m (drain height x2). B) tar on the top stage where r=1.83m, deduct area of x4 gas ports, r= 0.533m, h= level to chinamans hats 0.45m, calc volume, C) tar on the vessel walls where r=1.83m, h= 24m, D) tar on false bottom where πr^2h where r = 1.83m and h =0.005m tar thickness. Assume a 5mm tar film on the walls. Operating inlet gas temp 80C
		Primary Cooler 2C101		8.90				Vessel drained and on a N_2 blanket. Calcs, A) tar in the base base where r = 1.83m and h =assumed 0.3m (drain height x2). B) tar on the top stage where r=1.83m, deduct area of x4 gas ports, r= 0.533m, h= level to chinamans hats 0.45m, calc volume, C) tar on the vessel walls where r=1.83m, h= 24m, D) tar on false bottom where πr^2h where r = 1.83m and h =0.005m tar thickness. Assume a 5mm tar film on the walls. Operating inlet gas temp 80C 01/12/2022 - steaming of 2C101 and 2C102 commenced.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Primary Cooler 2C102		8.90				Vessel drained and on a N_2 blanket. Calcs, A) tar in the base base where r = 1.83m and h =assumed 0.3m (drain height x2). B) tar on the top stage where r=1.83m, deduct area of x4 gas ports, r= 0.533m, h= level to chinamans hats 0.45m, calc volume, C) tar on the vessel walls where r=1.83m, h= 24m, D) tar on false bottom where $\pi r^2 h$ where r = 1.83m and h =0.005m tar thickness. Assume a 5mm tar film on the walls. Operating inlet gas temp 80C 01/12/2022 - steaming of 2C101 and 2C102 commenced.
		Primary Cooler Heat Exchanger 1E101/1E102		0.44				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.35m³ full x2 = 0.75m³. both half full divide by 2= 0.35m³ total.Assume all tar.
		Primary Cooler Heat Exchanger 1E103/1E104		0.44				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.35m³ full x2 = 0.75m³. both half full divide by 2= 0.35m³ total.Assume all tar.
		Primary Cooler Heat Exchanger 1E105/1E106		0.40				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.345m³ full x2 = 0.69m³. both half full divide by 2= 0.345m³ total. Assume all tar
		Primary Cooler Heat Exchanger 1E107/1E108		0.54				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.465m³ full x2 = 0.93m³. both half full divide by 2= 0.465m³ total.Assume all tar.
		Primary Cooler Heat Exchanger 1E109/1E110		0.44				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.465m³ full x2 = 0.93m³. both half full divide by 2= 0.465m³ total.Assume all tar.
		Primary Cooler Heat Exchanger 1E111/1E112		0.54				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.465m³ full x2 = 0.93m³. both half full divide by 2= 0.465m³ total.Assume all tar.
		Primary Cooler Heat Exchanger 2E101/2E102		0.54				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.465m³ full x2 = 0.93m³. both half full divide by 2= 0.465m³ total.Assume all tar.
		Primary Cooler Heat Exchanger 2E103/2E104		0.54				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.465m³ full x2 = 0.93m³. both half full divide by 2= 0.465m³ total.Assume all tar.
		Primary Cooler Heat Exchanger 2E105/2E106		0.54				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.465m³ full x2 = 0.93m³. both half full divide by 2= 0.465m³ total.Assume all tar.
		Primary Cooler Heat Exchanger 2E107/2E108		0.54				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.465m³ full x2 = 0.93m³. both half full divide by 2= 0.465m³ total.Assume all tar.
		Primary Cooler Heat Exchanger 2E109/2E110		0.46				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.4m³ full x2 = 0.8m³. both half full divide by 2= 0.4m³ total.Assume all tar.
		Primary Cooler Heat Exchanger 2E111/2E112		0.54				Both vessels drained to halfway. Calcs A) volume in the bottom half of the spiral product side. Product 0.465m³ full x2 = 0.93m³. both half full divide by 2= 0.465m³ total.Assume all tar.
		Detarrer 1V101		3.74				Vessel on a N_2 blanket. Calc A) tar on x3 decanter base plates, B) tar on lower walls, C) tar on hexagonal walls and cables. 3 x baseplates r=1.53m, w =0.1 lower walls h=1.573, w=0.005m hexagons x139 of 6 x 0.15m wide, h=4.5m, tar W=0.005m
		Detarrer 1V102		5.32				Vessel open to atmos, COGM physicaly disconnected, vessel isolated. Calc A) volume on cencentric walls, B) vol on distribution screens, C) vol on base walls D) vol in the base. Refer to JMG's Calculations
		Detarrer 2V101		5.32				Vessel open to atmos, COGM inlet blanked and outlet disconnected, vessel isoalted. Calc A) volume on cencentric walls, B) vol on distribution screens, C) vol on base walls D) vol in the base.
		Detarrer 2V102		3.74				Vessel on a N_2 blanket. Calc A) tar on x3 decanter base plates, B) tar on lower walls, C) tar on hexagonal walls and cables. 3 x baseplates r=1.53m, w =0.1 lower walls h=1.573, w=0.005m hexagons x139 of 6 x 0.15m wide, h=4.5m, tar W=0.005m
		Tar Receiving Tank North OT104		1.00				The tar tank sections have have been out of servicesince circa 2005. Calc A) tar in tank base, B) tar on the walls. Tar height=0.05m, L=4.115m, b= 3.66m, side wall h =1.83m. Tank dipped.
		Tar Receiving Tank South OT104		1.00				The tar tank sections have have been out of servicesince circa 2005. Calc A) tar in tank base, B) tar on the walls. Tar height=0.05m, L=4.115m, b= 3.66m, side wall h =1.83m. Tank dipped.
		Liquor Receiving Tank North OT104		6.02				The liquor tank sections have have been out of servicesince circa 2015. Calc A) tar in tank base, B) tar on the walls. Tar height=0.152m, L=7.62m, b= 4.115m, side wall h =3.505m. Assume tar thickness =0.005m. Tank dipped
		Liquor Receiving Tank South OT104		6.95				The liquor tank sections have have been out of servicesince circa 2015. Calc A) tar in tank base, B) tar on the walls. Tar height=0.178m, L=7.62m, b= 4.115m, side wall h =3.505m. Assume tar thickness =0.005m. Tank dipped.
		Liquor Receiving Tank OT111		3.47				The tank is part of the RWR system and in service. Calc A) tar in tank base, B) tar on the walls. Tar h = 0.025m, l=11.3, b=8.3 overflow h= 3.365, assume tar on walls = 0.005m. Tank dipped.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Tar Pump Tanks 1T102		2.91				Calculate A) the tar in the tank base section. Vol of rectangular section of base l=2m, b=1.2m h= 1m tank angled fro front to back calc area and divide by 2 Convergant section of base x2 sides b =0 .6m to 0m, l = 2m, h =1m calc volume l*b*h*0.5*2. Add together volumes B) calculate the volume of the top sec rectangular section of the tank and then 67% of this volume. Calculate the 100% volume of the measured top section of the tank, and muliply by 67% level. L=2m, B=1.2m, H=1m.
		Tar Pump Tanks 2T102		1.10				Calculate A) the tar in the tank base section. Vol of rectangular section of base l=2m, b=1.2m h= 1m tank angled from front to back calc area and divide by 2 Convergant section of base x2 sides b =0 .6m to 0m, l = 2m, h =1m calc volume l*b*h*0.5*2. Add together volumes B) calculate the volume of the top sec rectangular section of the tank and then 2% of this volume. Calculate the 100% volume of the measeured top section of the tank, and muliply by2% level. L=2m, B=1.2m, H=1m.
		Tar and Liquor Sump OA102		11.69				Calculate A) the volume of tar in the sump base. L=9m, b=4m tar h =0.3m
		DLSP from 1V101 Drain		0.09				Calculate A) vol of tar from the base to the overflow where h =2.74, overflow to OA102=2.56m, r=0.1m, level in the base assume 2.56m, B) vol of deposits on the walls above base deposits, h = 0.18m, , r=0.168m, assume deposits on walls w= 0.005m
		DLSP from 1V102 Drain		0.09				Calculate A) vol of tar from the base to the overflow where h =2.74, overflow to OA102=2.56m, r=0.1m, level in the base assume 2.56m, B) vol of deposits on the walls above base deposits, h = 0.18m, , r=0.168m, assume deposits on walls w= 0.005m
		DLSP from 2V101 Drain		0.09				Calculate A) vol of tar from the base to the overflow where h =2.74, overflow to OA102=2.56m, r=0.1m, level in the base assume 2.56m, B) vol of deposits on the walls above base deposits, h = 0.18m, , r=0.168m, assume deposits on walls w= 0.005m
		DLSP from 2V102 Drain		0.09				Calculate A) vol of tar from the base to the overflow where h =2.74, overflow to OA102=2.56m, r=0.1m, level in the base assume 2.56m, B) vol of deposits on the walls above base deposits, h = 0.18m, , r=0.168m, assume deposits on walls w= 0.005m
		Ammonia Washer Heat Exchanger 1E301		0.18				1E301- spiral 2°cooler. Calculate A) vol of tar in the product side. Assume same as stream 2. Max water flooded =7.083te, max empty = 5.82te, water vol max =1.263m³. assume 50% product side and 50% water side. Product side =0.632m³. The product side was drained to halfway so product= 0.632m³/2 = 0.316m³. Assume that the remainder was 50% tar and 50% liquor as there were partial blockages, so tar =0.316/2=0.158 Calculate 2nd substance A) vol of strong liquor in the product side. Assume same as stream 2. Max water flooded =7.083te, max empty = 5.82te, water vol max =1.263m³. assume 50% product side and 50% water side. Product side =0.632m³. The product side was drained to halfway so product= 0.632m³/2 = 0.316m³. Assume that the remainder was 50% tar and 50% liquor, so strong lquor =0.316/2=0.158m³
		Ammonia Washer Heat Exchanger 1E303		0.18				1E303- spiral 2°cooler. Calculate A) vol of tar in the product side. Assume same as stream 2. Max water flooded =7.083te, max empty = 5.82te, water vol max =1.263m³. assume 50% product side and 50% water side. Product side =0.632m³. The product side was drained to halfway so product= 0.632m³/2 = 0.316m³. Assume that the remainder was 50% tar and 50% liquor as there were partial blockages, so tar =0.316/2=0.158 Calculate 2nd substance A) vol of strong liquor in the product side. Assume same as stream 2. Max water flooded =7.083te, max empty = 5.82te, water vol max =1.263m³. assume 50% product side and 50% water side. Product side =0.632m³. The product side was drained to halfway so product= 0.632m³/2 = 0.316m³. Assume that the remainder was 50% tar and 50% liquor, so strong lquor =0.316/2=0.158m³
		Ammonia Washer Heat Exchanger 2E301		0.24				2E301- spiral 2°cooler. Calculate A) vol of tar in the product side. Face plate shows product side vol=0.84m³. Drained to halfway so 0.42m³.The spiral was partially blocked so assume 50% tar so 0.21m³vol tar and 0.21m³ vol ammonia liquor. Calculate 2nd substance A) vol of strong liquor in the product side.
		Ammonia Washer Heat Exchanger 2E302		0.24				2E302- spiral 2°cooler. Calculate A) vol of tar in the product side. Face plate shows product side vol=0.84m³. Drained to halfway so 0.42m³.The spiral was partially blocked so assume 50% tar so 0.21m³vol tar and 0.21m³ vol ammonia liquor. Calculate 2nd substance A) vol of strong liquor in the product side.
		Ammonia Washer Heat Exchanger 2E303		0.24				2E303- spiral 2°cooler. Calculate A) vol of tar in the product side. Face plate shows product side vol=0.84m³. Drained to halfway so 0.42m³.The spiral was partially blocked so assume 50% tar so 0.21m³vol tar and 0.21m³ vol ammonia liquor. Calculate 2nd substance A) vol of strong liquor in the product side.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		Free Ammonia Still 1C303		0.39				1C303, Calculate A) vol of tar in the base. Assume that the vessel ID is the same as that of 2C303. So r=0.61m, tar elvel is asssumed at 0.25m from previous vessel cleaning, using (πr^2h). B) vol of tar on the trays where trays =18, height of tar on trays is assumed as 0.002m, r=0.61m,using (πr^2h)
		Free Ammonia Still 2C303		0.14				2C303, the vessel was cleaned prior to shutdown. There is tar residue in the base. Calculate the volume of tar in the base where r=0.61m, tar h= 0.1m average. Use (πr^2h).
		Fixed and Free Still 1C304		11.47				1C304 F+F still. Calc A) vol on fixed still trays where, the overflow risers h= 0.103m, r= 0.8m and there are 8 trays total. Use ($8\pi r^2h$), B) vol in fixed still base, where the drain height h= 0.075m and r= 0.8m. and there are 8 trays total. Use (πr^2h) C) vol on fixed still walls, where h=4.488m,r=0.8, anthickness on the walls w = 0.02m. Use ($2\pi rhw$). D) vol on free still trays and walls, where the overflow risers h= 0.103m, r= 0.8m and there are 8 trays total. Use ($8\pi r^2h$) E) vol in free still base where the height to the steam section is h= 2.225m and r= 0.8m. Use(πr^2h).Then calcullate the volume of the cone where h=0.725m. Use ($\pi r^2h/3$). Then add the two totals to give total vol in this base. F) vol on free still walls, where h=4.01m, r=0.8, and the thickness on the walls w = 0.02m. Use ($2\pi rhw$).
		Fixed and Free Still OC305		0.38				OC305 F+F still. Calc A) vol on fixed still trays where the overflow tar height per tray is assumed 0.002m, r= 0.615m and there are 19 trays total. Use ($19\pi r^2h$)., B) vol in fixed still base where the base drain height h= 0.16m and r= 0.615m. Use (πr^2h), C) vol on fixed still walls where h=12.21m, r=0.615m, and thickness on the walls w = 0.002m. Use ($2\pi rhw$).
		Ammonia Road Sump		0.76				Ammonia Road sump. Calc A) vol in base where r=0.75m, residue in base h=0.29m. Use (πr^2h), B) vol on walls where r=0.75m, sump h=3.05, and thickness on the walls w=0.01m.Use ($2\pi rhw$). Calculate 2nd substance A) max vol of CRW in the sump where r=0.75m, h=3.05. Use (πr^2h). Site measued.
		Purifier 1C404		1.16				1C404 purifier wastaken out of service pre 1999. It is unclear whether it was cleaned out. Assume not cleaned. Estimated contamination if not clean expected to be circa $1m^3$ from experience
		Gasholder Sump East Side		1.66				The gasholder sump east side. Calc A) vol in sump base. Levels were taken at x3 points. Averages were calculared between the north end and the midde, and the south end and the middle. The results were hN= 0.07m, hS =0.49m, l=3m, b=0.885m . Use (lbw) to calculate both vols and add together. B) vol on sump walls where the average thickness w = 0.04m, l=3m, b=0.885m and h = 2.12. V= 2(l+b) hw) . Site measured and dipped.
		Gasholder Sump West Side		1.92				The gasholder sump wast side. Calc A) vol in sump base. Levels were taken at x3 points. Averages were calculared between the north end and the midde, and the south end and the middle. The results were hN= 0.07m, hS =0.395m, l=3m, b=0.885m . Use (lbw) to calculate both vols and add together. B) vol on sump walls where the average thickness w = 0.04m, l=3m, b=0.885m and h = 2.12. V= 2(l+b) hw) . Site measured and dipped.
		Export Gas Booster Casing 1B501		0.03				1B501 booster casing. Calc A) vol of tar deposits on the casing and in the the base. Based on previous cleaning we would estimate this at $0.02m^3$
		Export Gas Booster Casing OB501		0.03				O1B501 booster casing. Calc A) vol of tar deposits on the casing and in the the base. Based on previous cleaning we would estimate this at $0.02m^3$
		Export Gas Booster Casing 2B501		0.03				2B501 booster casing. Calc A) vol of tar deposits on the casing and in the the base. Based on previous cleaning we would estimate this at $0.02m^3$
		OT801 Virgin		0.00				OT801 emergency liquor storage tank, Calc A) vol of tar in the base where, r=4.5m, tar h=0.5m. Use (πr^2h), B) vol of tar on the walls where, r=4.5m, level above tar h=8.67m and thickness in the walls =. Use ($2\pi rhw$) 06/09/2022 - 324x205L drums and 13xIBCs awaiting removal from site by Erith. 14/11/2022 - all Phase 1 wastes removed from site.
		1T802 Virgin		0.00				1T802 emergency liquor storage tank, Calc A) vol of tar in the base where r=4.5m, tar h=0.33m. Use (πr^2h), B) vol of tar on the walls where r=4.5m, level above tar h=8.67m and thickness in the walls =. Use ($2\pi rhw$) 06/09/2022 - 324x205L drums and 13xIBCs awaiting removal from site by Erith. 14/11/2022 - all Phase 1 wastes removed from site.

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) (2015)	2020 Inventory (t)	Qualifying Quantities (t)		COMAH Applicability	Justification for Quantities
					Lower Tier	Upper Tier		
		OT809 Virgin		0.00				OT809 emergency liquor storage tank, Calc A) vol of tar in the base where r=2.89m, tar h=0.19m. Use ($\pi r^2 h$), B) vol of tar on the walls where, r=2.89m, level above tar h=4.54m and thickness in the walls w =0.005m =. Use ($2\pi rhw$) 06/09/2022 - 324x205L drums and 13xIBCs awaiting removal from site by Erith. 14/11/2022 - all Phase 1 wastes removed from site.
		OT812 Virgin		0.00				OT812 emergency liquor storage tank, Calc A) vol of tar in the base where, r=2.51m, tar h=0.19m. Use ($\pi r^2 h$), B) vol of tar on the walls where, r=4.5m, level above tar h=8.67m and thickness in the walls =. Use ($2\pi rhw$). 06/09/2022 - 324x205L drums and 13xIBCs awaiting removal from site by Erith. 14/11/2022 - all Phase 1 wastes removed from site.
		By-Products Gullies		352.95				The By Products gullies. Calc A) vol in the the gullies. JMcG conducted survey of the by prodcuts gullies and this revealed that there was 304.27m^3 of tar residues in them. Reference the gulley report on the U-drive
		Tar & Liquor Bund		2.32				Calc A) the vol of tar within bunded areas around the bases of the tar tanks including spillag. Estimate the tar in the bunds around the bases of the tar tanks. Calc the total tar if l=5m, b= 4m and h= 0.1m . Use (lbh)
		Total Coal Tar RCO	**3,400**	**2097.55**				
	RMH	RMH tar ponds.	300					
	Total Coal Tar		**4,040**	**2585.83**				**There has been a change in Ammonia Liquor and resultant tar inventory (also discussed in the Hazardous Substances tab) from previous versions of the inventory. Using Tar Decanter 1T113 as an example, the following justification can be made:** **- The ammonia liquor inventory was changed from 28.3m^3 (or 28.3T) to nil as, on investigation, the previous inventory was found to be incorrect - the ammonia liquor content had been removed and tar had been transferred in from other decanters.** **- The decanter was dipped to determine the current tar level.** **- The volume in the tar decanter is all tar, so on recalculation the tar inventory increased by 39.041m^3 (or 44.897T).**
	Total E2 Hazardous to Aquatic Environment		**4,482**	**2883.74**				

NOTES

1. Inventories correct on date of review but are subject to change.
2. Significant inventories only highlighted in breakdown by specific area.

Current Inventory of Non-COMAH Hazardous Su

Specific Substance	Plant Area	Specific Location	Maximum Inventory (t) 2015
Process Substances and By-products			
Cokemaking			
	SBCO	Flushing liquor pump tank No 01	47
		Flushing liquor pump tank No 02	47
		Virgin Liquor tank	900
		Strong liquor tank No. 1	1000
		Strong liquor tank No. 2	1000
		Strong liquor tank No. 3	1000
		Strong liquor tank No. 4	1000
		Tar/liquor Decanter "A"	175
		Tar/liquor Decanter "B"	175
		East Low Level Pond	138
		West Low Level Pond	138
		West Interceptor Pit	125
		Primary Cooler Sump	5
		Secondary Cooler Sump (East Interceptor Pit)	20
		L Tank	1000
		M Tank	1000
		Total Ammonia Liquor at SBCO	**7,770**
		1T301 - Circulating Liqour Storage Tank (Strong)	830
		2T301 - Circulating Liqour Storage Tank (Strong)	830
		0T112 Virgin	500

		OT105 - Virgin Liquor Tank (Virgin)	500
		OT801 Virgin	455
		1T802 Virgin	455
		OT809 Virgin	156
		OT812 Virgin	138
		2T410 Virgin	570
		1T113 - Tar & Liqour Decanter (Virgin)	204
		2T113 - Tar & Liqour Decanter (Virgin)	204
		2T103 - Tar & Liqour Decanter (Virgin)	246
		2T103 - Tar & Liqour Decanter (Virgin)	246
		OT111 - Liquor Receiving Tank (Virgin)	287
		OT104 - Tar & Liquor Receiving Tank (Virgin)	228
		OT304 - Effluent Feed Tank (Influent)	800
		OA305 T2A Influent	655
		OA305 T2B Influent	655
		OA305 T2C Influent	655
		OA305 T2D Influent	655
		OA306 E Effluent	398
		OA307 W Effluent	398
		OT305 E Effluent	Not known in 2015
		OT305 W Effluent	Not known in 2015
		OT303 Influent	160
		OA301 - Lime Settling Sump (Influent)	155
		OA302 Condensates	126
		OA303 Concentrated	31
		OA102 Mix	45.5
Ammonia Liquor		4 x ex. Butane Tanks Virgin	Not known in 2015
	RCO	Ammonia Washer Heat Exchanger 1E301	

Ammonia Washer Heat Exchanger 1E303	
Ammonia Washer Heat Exchanger 2E301	
Ammonia Washer Heat Exchanger 2E302	
Ammonia Washer Heat Exchanger 2E303	
Ammonia Washer DEPH Plate Heat Exchanger 1C303	
Ammonia Washer DEPH Plate Heat Exchanger 2C303	
Ammonia Washer DEPH Plate Heat Exchanger 1C304	
Ammonia Washer DEPH Plate Heat Exchanger 2C304	
Ammonia Washer DEPH Plate Heat Exchanger OC305	
Stripped Liquor Plate Heat Exchanger 1E306	
Stripped Liquor Plate Heat Exchanger 1E308	
Stripped Liquor Plate Heat Exchanger 2E306	
Stripped Liquor Plate Heat Exchanger 2E308	
1/2F301 Knock Out Pot	

		Total Ammonia Liquor at RCO	**10,583**
	P&E	Cleveland Oil Installation (COI) No Tank 5	10,000
	Total Ammonia Liquor		**28,353**
	RCO	OT205 - Wash Oil Storage Tank	41
		OT206 - Wash Oil Storage Tank	41
		OT203 - Dividing Tank	Not known in 2015
		1T201 - Oil Decanting Tank	Not known in 2015
		2T201 - Oil Decanting Tank	Not known in 2015
		1C201 - Main Naphthalene Washer	Not known in 2015
		2C201 - Main Naphthalene Washer	Not known in 2015
		Main Oil Preheater OE201	

Naphthalene Absorbing Oil (Petroleum Wash Oil)		Nap Still/Condy & Vapour KO Pots OC202	
		South Water Sump OA201	
		Final Nap Oil Preheater OE203	
		Spare Oil Preheater OE205	
		Stripped Oil Cooler OE204	
		Final Naphthalene Washer 1W501	
		Final Naphthalene Washer OW502	
		Final Naphthalene Washer 2W501	
		OA202 Sump	
		Rich Oil Tank OT207	
		Total NAO at RCO	
	SBCO	No.1 Final Nap Washer	
		No.2 Final Nap Washer	
		No.3 Final Nap Washer	

		Total NAO at SBCO	
	Total Naphthalene Absorbing Oil		**194**
	RCO	DLSP COG Main to Battery S101A	
		DLSP COG Main to Battery S101B	
		DS COG Main to Battery S101C	
		Donkin Sealpot adjacent to CO21	
		DL Sealpot 1°c Outlet Manifold	
		DLSP 2B101 Exhaust Inlet Manifold	
		DLSP 1B101 Exhaust Inlet Manifold	
		1B101 DLSP Exhaust Outlet Manifold	
		2B101 DLSP Exhaust Outlet Manifold	
		1C101 Syphon Breaker	
		1C102 Syphon Breaker	
		2C101 Syphon Breaker	

Coke Oven Gas Condensate		2C102 Syphon Breaker	
		1C201 Dipleg Sealpot	
		2C201 Dipleg Sealpot	
		1F301 Inlet Gas Sealpot	
		2F301 Inlet Gas Sealpot	
		1C301 Inlet Dipleg Sealpot	
		2C301 Inlet Dipleg Sealpot	
		Dipleg Sealpot at west end of Final Naphthalene Washers	
		Stretford Loading Main Dipleg	
		Gasholder Base East U-Seal (pipe)	
		Gasholder Base N/W U-Seal (pipe)	
		Gasholder Base (S) U-Seal (pipe)	
		Flarestack Inlet Sealpot	

Dipleg H2S/HCN Inlet Gas Main	
Dipleg H2S/HCN Inlet Gas Main	
Sealpot H2S/HCN Inlet Gas Main	
Sludge Thickener	
Butane Tank	
Butane Tank	
Butane Tank	

		Butane Tank	
		Total COG Condensate at RCO	
	Total Coke Oven Gas Condensate		
Bulk/Industrial Gases and Cylinders			
Gaseous Nitrogen	RBF	Blast Furnace Gas Mains	
	Coke Oven Gas Main	6km main plus offshoots	
	Total Gaseous Nitrogen		**0**
Coal			
Coal	RMH	Coal Crusher House Coal Bunker	Not known in 2015
		On Ground	Not known in 2015
	RCO	Battery Bunkers	Not known in 2015
	SBCO	Battery Bunkers	Not known in 2015
	RBF	RCO Coal outside of pelletiser shed	-
-	**Total Coal**		**0**

ubstances Present at STS

2020 Inventory (t)
65.2168
16.2976
82

0.13904

0.13904
0.1848
0.1848
0.1848
0.09064
0.09064
0.0704
0.0704
0.04664
0.16896
0.10912
0.16896
0.10912
0.0088

2
83
0
0
0
21
21
9
9
0

8
9
0
0
0
6
6
6
0
2
96
0
0
0

0
96
0.216
0.216
0.442
0.957
0.001
0.016
0.02
0.04
0.083
0.03
0.03
0.03

0.03
0.036
0.166
0.055
0.055
0.3
0.3
0.055
0.55
0.014
0.014
0.014
0.065

0.081
0.071
0.081
165
0
0
0

0
169
169
6.1899
1.8765
8
320
320

C

Justification for Quantities
Demolished.
Demolished.
Demolished.
Demolished.
Demolished.
Demolished.
Demolished.
Demolished.
Demolished.
Concrete sump L 11.58m x W 3.2m x H 2.28. Sump dipped Tar 0.6 water 2
Concrete sump L 11.58m x W 3.2m x H 2.28. Sump dipped Tar 2 water 0.5
Demolished.
Demolished.

Demolished.

Demolished.

Demolished.

Demolished.

Demolished.

Demolished.

1E301- spiral 2°cooler. Calculate A) vol of tar in the product side. Assume same as stream 2.
Max water flooded =7.083te, max empty = 5.82te, water vol max =1.263m³. assume 50% product side and 50% water side. Product side =0.632m³. The product side was drained to halfway so product= 0.632m³/2 = 0.316m³. Assume that the remainder was 50% tar and 50% liquor as there were partial blockages, so tar =0.316/2=0.158
Calculate 2nd substance A) vol of strong liquor in the product side. Assume same as stream 2.
Max water flooded =7.083te, max empty = 5.82te, water vol max =1.263m³. assume 50% product side and 50% water side. Product side =0.632m³. The product side was drained to halfway so product= 0.632m³/2 = 0.316m³. Assume that the remainder was 50% tar and 50% liquor, so strong lquor =0.316/2=0.158m³

1E303- spiral 2°cooler. Calculate A) vol of tar in the product side. Assume same as stream 2. Max water flooded =7.083te, max empty = 5.82te, water vol max =1.263m³. assume 50% product side and 50% water side. Product side =0.632m³. The product side was drained to halfway so product= 0.632m³/2 = 0.316m³. Assume that the remainder was 50% tar and 50% liquor as there were partial blockages, so tar =0.316/2=0.158 Calculate 2nd substance A) vol of strong liquor in the product side. Assume same as stream 2. Max water flooded =7.083te, max empty = 5.82te, water vol max =1.263m³. assume 50% product side and 50% water side. Product side =0.632m³. The product side was drained to halfway so product= 0.632m³/2 = 0.316m³. Assume that the remainder was 50% tar and 50% liquor, so strong lquor =0.316/2=0.158m³
2E301- spiral 2°cooler. Calculate A) vol of tar in the product side. Face plate shows product side vol=0.84m³. Drained to halfway so 0.42m³.The spiral was partially blocked so assume 50% tar so 0.21m³vol tar and 0.21m³ vol ammonia liquor. Calculate 2nd substance A) vol of strong liquor in the product side.
2E302- spiral 2°cooler. Calculate A) vol of tar in the product side. Face plate shows product side vol=0.84m³. Drained to halfway so 0.42m³.The spiral was partially blocked so assume 50% tar so 0.21m³vol tar and 0.21m³ vol ammonia liquor. Calculate 2nd substance A) vol of strong liquor in the product side.
2E303- spiral 2°cooler. Calculate A) vol of tar in the product side. Face plate shows product side vol=0.84m³. Drained to halfway so 0.42m³.The spiral was partially blocked so assume 50% tar so 0.21m³vol tar and 0.21m³ vol ammonia liquor. Calculate 2nd substance A) vol of strong liquor in the product side.
1E304- 1C303 deph plate hex, calc vol of strong liquor. Site measured l=1.7m, b=0.64m, w=0.285m. Calc vol using (lbw/3). Assume 3 equal volumes for plates,cooling water and strong liquor .
2E304- 2C303 deph plate hex, calc vol of strong liquor. Site measured l=1.7m, b=0.64m, w=0.285m. Calc vol using (lbw/3). Assume 3 equal volumes for plates,cooling water and strong liquor .
1E305- 1C304 deph plate hex, calc vol of strong liquor. Site measured l=1.7m, b=0.64m, w=0.22m. Calc vol using (lbw/3). Assume 3 equal volumes for plates,cooling water and strong liquor .
2E305- 2C304 deph plate hex, calc vol of strong liquor. Site measured l=1.7m, b=0.64m, w=0.22m. Calc vol using (lbw/3). Assume 3 equal volumes for plates,cooling water and strong liquor .
0E313- 0C305 deph plate hex, calc vol of strong liquor. Site measured l=1.7m, b=0.62m, w=0.15m. Calc vol using (lbw/3). Assume 3 equal volumes for plates,cooling water and strong liquor .
1E306 plate hex, calc vol of strongand stripped NH^3 liquor. Site measured l=2.23, b=0.45m, w=0.285m. Calc vol using (lbw/3). Assume 3 equal volumes for plates,cooling water and strong liquor and multiply by 2 for both types of liquor.
1E308 plate cooler hex, calc vol of stripped NH^3 liquor. Site measured l=1.50m, b=0.635m, w=0.39m. Calc vol using (lbw/3). Assume 3 equal volumes for plates,cooling water and stripped liquor.
2E306 plate hex, calc vol of strongand stripped NH^3 liquor. Site measured l=2.23, b=0.45m, w=0.285m. Calc vol using (lbw/3). Assume 3 equal volumes for plates,cooling water and strong liquor and multiply by 2 for both types of liquor.
2E308 plate cooler hex, calc vol of stripped NH^3 liquor. Site measured l=1.50m, b=0.635m, w=0.39m. Calc vol using (lbw/3). Assume 3 equal volumes for plates,cooling water and stripped liquor.
From experience there is usually some condensed strong ammomnia vapours which remain in the pot Assume 0.010m³

Demolished.
There has been a change in Ammonia Liquor and resultant tar inventory (discussed on the COMAH Dangerous Substances tab) from previous versions of the inventory. Taking Ammonia Washers 1C301, 1C302, 2C301 and 2C302 as examples, the following justification can be made: **- A Redcar Coke Ovens Supervisor confirmed taht the washer bases had been drained after closure.** **- Given the known tar contamination problems with the ammonia washers it was assumed that an volume remaining in the washer bases and on the stages would be tar as the washer stage overflows are low.** **- Based on this, the tar volumes when recalculated for tar were lower than that of the original liquor calculations, due to the reduced volumes in the washer bases.** **- The volumes encompassed by the four gas risers on each stage were deducted. This reduced the ammonia liquor inventory at RCO.**
OT205 is a horizontal tank with ellipsoidal ends. A) Calculate the capacity of the tank and the volume in the tank. L=7.25m, oil height h = 1.65m, r=1.375m. Use tank calculator 30.92m³fresh oil, 49.219m³ max capacity. Http://checalc.com/calc/vessel Inventory removed 12/02/2022. Tank decontaminated 12/02/2022. 06/09/2022 - 7,380L removed from site by MGL.
OT206 is a horizontal tank with ellipsoidal ends. A) Calculate the capacity of the tank and the volume in the tank. L=7.65m, oil height h = 0.66m, r=1.375m. Use tank calculator 8.927 used oil, 49.219m³ max capacity. Http://checalc.com/calc/vessel Inventory removed 13/02/2022. Tank decontaminated 13/02/2022. 06/09/2022 - 7,380L removed from site by MGL.
Tank level 56% at closure. A) Calculate volume in the tank Level 56% = 0.77m =h, r= 0.685m, l =3.09m o the straight section. Calculated by a reckoner vol of pet oil = 3.43m³ , max vol =5.93m, B) calc vol on walls by 2πrlw, where r=0.685m, l=3.09m, and thickness on walls w =0.002m Tank decontaminated 06/03/2022.
Calculate A) vol of pet oil in 1st x2 chambers l=5m, b= 2.134m, h=2.184m, B) calc vol in the pumping chamber at 9% r, l=1.296, b=2.134m, h=2.184, C) calc vol below the level transmitter in the pumping chamber where l=1.296, b=2.134m, h=0.1524m.
Calculate A) vol of pet oil in 1st x2 chambers l=5m, b= 2.134m, h=2.184m, B) calc vol below the level transmitter in the pumping chamber where l=1.296, b=2.134m, h=0.1524m.
Vessel on the nitrogen blanket. Calculate A) vol of pet oil in the base $\pi r^2 h$ where r = 1.75m and h =assumed 0.8m, B) vol on the upper stage. Downcomer h= 0.1m, r= 1.75m, C) vol on the walls =2πrhw. R=1.75m, h=23m, thickness on walls = 0.005m.
Vessel on the nitrogen blanket. Calculate A) vol of pet oil in the base $\pi r^2 h$ where r = 1.75m and h =assumed 0.8m, B) vol on the upper stage. Downcomer h= 0.1m, r= 1.75m, C) vol on the walls =2πrhw. R=1.75m, h=23m, thickness on walls = 0.005m.
Calculate A) volume of Pet oil on the walls of the MNW pair of oil heaters =24, r= 0.0125m, heaters x2, l=4.88m, thickness on the walls =0.002m use 2πrlw. Muliply answer by 24 and then by 2. The heaters have been drained

Calculate A) vol on stages below risers $\pi r^2 h$, where h= 0.127m, r=1.1425m. Multiply the answer by 14, B) vol on stage walls above riser $2\pi rhw$, where r=1.1425m, h=0.178m,thickness on walls w= 0.002m. Multiply by 14 for the number of stages., C) vol on remainder of vessel walls, $2\pi rhw$, where r=1.1425m, remainder h=3.205m,thickness on walls w= 0.002m. D) vol on top stage below the drain $\pi r^2 h$ where h=0.13m, r=1.1425m, Calc area of the vol of the x7 risers using $7\pi r^2 h$ where r=0.19m and h =0.13m. Then subtract the two vols to give the final vol, E) vol in the base below outlet pipewhere h= 0.25m, r=1.1425m. Calc vol in cone walls using $\pi r^2 h/3$, where assume h= 0.15m, r=1.1425m. ADD both totals together
OA201 sump. Calculate A) vol of pet oil in the oil section of the sump where l= 3.8m, b= 2.7m and the oil level h=1.03m .
Calculate A) volume of Pet oil on the walls of the MNW pair of oil heaters =24, r= 0.0125m, heaters x2, l=4.88m, thickness on the walls =0.002m use $2\pi rlw$. Muliply answer by 24 and then by 2. The heaters have been drained
Calculate A) volume of Pet oil on the walls of the MNW pair of oil heaters =24, r= 0.0125m, heaters x2, l=4.88m, thickness on the walls =0.002m use $2\pi rlw$. Muliply answer by 24 and then by 2. The heaters have been drained
OE204 stripped oil coolers (x2)have been O.O.S since circa 2005. Calculate A) vol of oil in the two coolers l=4.875, tube r=0.01625m, using $\pi r^2 l$ multiply by 24 tubed and multiply by 2 for cooler numbers.
Calculate A) vol of pet oil in the tank base where l=5.1m, B=4m and vol in base h=0.3m based on level inside 2W501, B) vol on the tank walls and multiply by thickness on the walls where w=0.002m, l=5.1m, b= 4m and h= 6.7m. Calc using (l+b)2hw
Calculate A) vol of pet oil in the tank base where l=5.1m, B=4m and vol in base h=0.3m based on level inside 2W501, B) vol on the tank walls and multiply by thickness on the walls where w=0.002m, l=5.1m, b= 4m and h= 6.7m. Calc using (l+b)2hw
Calculate A) vol of pet oil in the tank base where l=5.1m, B=4m and vol in base h=0.3m based on level inside 2W501, B) vol on the tank walls and multiply by thickness on the walls where w=0.002m, l=5.1m, b= 4m and h= 6.7m. Calc using (l+b)2hw
OA202 sump.Calculate A) vol of pet oil residue in the base of the sump where l=1.42m, b=1.45m, max h= 2.64m, pet poil sludge = 0.01m. (Water level varies, sump max level 5.44m^3)
OT207 rich oil tank. Calculate A) vol in the tank where h= 1.475m, l=3.99m, b=2.39m, H oil =0.28m, B) vol on the walls. Calc surface area and multiply by the thickness on the walls where w=0.002m, h = 1.195m, l=3.99, and b= 2.39m using (l+B)2hw
L 8.53m x W 2.74m x H 5.61. Vessel taken out of service & drained down c.1980. N2 purged 2015. a) Vessel dipped indicating depth 0.8m in base. b) 2mm film on shell 06/09/2022 - 67 IBCs of NAO awaiting removal from site by Keltbray. 21/12/2022 - Removed from site October 2022.
L 8.53m x W 2.74m x H 5.61. Vessel taken out of service & drained down c.1980. N2 purged 2015. a) Vessel dipped indicating depth 0.8m in base. b) 2mm film on shell 06/09/2022 - 67 IBCs of NAO awaiting removal from site by Keltbray. 21/12/2022 - Removed from site October 2022.
L 8.53m x W 2.74m x H 5.61. Vessel taken out of service & drained down c.1980. N2 purged 2015. a) Vessel dipped indicating depth 0.8m in base. b) 2mm film on shell 06/09/2022 - 67 IBCs of NAO awaiting removal from site by Keltbray. 21/12/2022 - Removed from site October 2022.

COGM deposits. r=0.168m,assume thickness in the walls is 0.005m, level above base deposits to o/flow h=2.42m, B) r=0.168m, h=0.1m COGM condy r=0.1268m, h=2.42m
COGM deposits. r=0.168m,assume thickness in the walls is 0.005m, level above base deposits to o/flow h=2.42m, B) r=0.168m, h=0.1m COGM condy r=0.1268m, h=2.42m
COGM deposits r=0.625m, internal h=1.5m, deposits in base 0.3m. Tank dipped COGM condensate r=0.625m, internal h=1.5m, condy above the deposits in base h=0.36m. Tank dipped
COGM deposits r=0.625m, internal h=1.5m, deposits in base 0.02m. Tank dipped COGM condensate r=0.625m, internal h=1.5m, condy in base above thedeposits h=0.78m. Tank dipped
Calculate A) vol COGM deposits in the base r=0.125m, h=1.03m. Site measured. Sealpot h=1.2m, overflow h=1.05m, B) vol of deposits on the walls R=0.125, h=0.17. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.125m, h condy =0.02m.
Calculate A) vol COGM deposits in the base r=0.125m, h=0.6m. Site measured. Sealpot h=1.1m, overflow h=0.92m, B) vol of deposits on the walls R=0.125, h=0.57. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.125m, h condy =0.32m.
Calculate A) vol COGM deposits in the base r=0.125m, h=0.6m. Site measured. Sealpot h=1.1m, overflow h=0.92m, B) vol of deposits on the walls R=0.125, h=0.57. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.125m, h condy =0.32m.
Calculate A) vol COGM deposits in the base r=0.1m, h=1.1m. Site measured. Sealpot h=2.8m, overflow h=2.46m, B) vol of deposits on the walls R=0.125, h=1.7. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot R= 0.1m, h condy =1.26m.
Calculate A) vol of deposits on the walls R=0.125, h=2.8. Assume wall deposit thickness w=0.005m. Site measured. Calculate 2nd substance A) vol of COGM condy in the pot. Note the sealpot is full of condensate R= 0.1, h condy =2.64m
Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.
Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.
Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.

Calculate A) vol COGM deposits in the base h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, B) vol of deposits on the walls h = 0.9m, , r=0.168m, assume deposits on walls w= 0.005m. Calculate 2nd substance A) vol of COGM condy in the pot h =1m, overflow to decanters 0.44m, r=0.168m, level in the base assume 0.1m, COGM condy above base deposits h=0.34m.
Calculate A) COGM deposits in base h= 2.475m, r= 0.193m (Height of sealpot 3.2m) (Height of sealpot overflow2.82m) , B) calc COGM deposits on the walls $2\pi rhw$ r=0.193m, h=0.42m, thickness on walls w= 0.1m. Calculate 2nd substance A) vol of COGM condy in the pot $2\pi r^2h$, where 0.193m, h= 0.305m..
Calculate A) COGM deposits in base h= 0.280m. r= 0.193m (Height of sealpot 3.2m) (Height of sealpot overflow2.82m) , B) calc COGM deposits on the walls $2\pi rhw$ r=0.193m, h=1.55m, thickness on walls w= 0.1m. Calculate 2nd substance A) vol of COGM condy in the pot $2\pi r^2h$, where h=0.193, h= 1.37m.
S301 dipleg s/pot. Calulate A) vol of COGM condensate where r=0.09m and h= 2.17m. Use (πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.09m and h= 0.37m Use (πr^2h). Site measured.
S302 dipleg s/pot. Calulate A) vol of COGM condensate where r=0.09m and h= 2.17m. Use (πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.384m, overflow h=2.575m, and thckness on the walls is 0.002m. (Use $2\pi r^2hw$). Site measured.
S304 sealpot has been removed from service but contains COGM condensates+ residues. Calculate A) vol of the COGM condensate where r=0.384m, overflow h=2.575m. (Use πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.384m, overflow h=2.575m, and thckness on the walls is 0.002m. (Use $2\pi r^2hw$). Site measured.
S305 sealpot has been removed from service but contains COGM condensates+ residues. Calculate A) vol of the COGM condensate where r=0.384m, overflow h=2.575m. (Use πr^2h). Calculate 2nd substance A) vol of COGM deposits where r=0.384m, overflow h=2.575m, and thckness on the walls is 0.002m. (Use $2\pi r^2hw$). Site measured.
S501A/B gas DLSP. Calc A) vol of COGM deposits in the base where r=0.384m, overflow h=2.575m. (Use πr^2h). Calculate 2nd substance A) vol of COGM condensates in the s/pot where level between overflow and deposits in the base h=2.18m, and r=0.09m . Use (πr^2h). Site measured
S503A/B/C east stretford loading gas DLSP. Calc A) vol of COGM deposits in the base where r=0.384m, overflow h=2.575m. (Use πr^2h). Calculate 2nd substance A) vol of COGM condensates in the s/pot where level between overflow and deposits in the base h=2.18m, and r=0.09m . Use (πr^2h). Site measured
S517 G/H base east u-seal (pipe). Calc A) vol of COGM residue in the base where pipe l=1.75m. Pipe r= 0.05m. Use (πr^2l). Site Measured. . Site Measured.
S518 G/H base n/westeast u-seal (pipe). Calc A) vol of COGM residue in the base where pipe l=1.75m. Pipe r= 0.05m. Use (πr^2l). Site Measured. . Site Measured.
S519 G/H base south u-seal (pipe). Calc A) vol of COGM residue in the base where pipe l=1.75m. Pipe r= 0.05m. Use (πr^2l). Site Measured. . Site Measured.
S508 flarestack inlet sealpot. Calc A) vol of COGM condensate in the sealpot. Site Measured

S701 H_2S/HCN gas main DLSP. Calc A) vol of COGM deposits in the base where r=0.1m, residue h=0.15m. (Use πr^2h), B) vol of COGM deposits on the walls where r=0.1m, overflow h=2.57m and wall thickness w=0.005. Use $(2\pi rhw)$. Calculate 2nd substance A) vol of COGM condensates in the s/pot where r=0.1m, overflow h=2.575m. (Use πr^2h). Site measured

S702 H_2S/HCN gas main DLSP. Calc A) vol of COGM deposits in the base r=0.1m, residue h=0.15m. (Use πr^2h), B) vol of COGM deposits on the walls where r=0.1m, overflow h=2.25m and wall thickness w=0.005. Use $(2\pi rhw)$. Calculate 2nd substance A) vol of COGM condensates in the s/pot where r=0.1m, overflow h=2.575m. (Use πr^2h). Site measured

S703A/B Inlet gas main DLSP. Calc A) vol of COGM deposits in the base where r=0.1m, residue h=0.15m. (Use πr^2h), B) vol of COGM deposits on the walls where r=0.1m, overflow h=2.57m and wall thickness w=0.005. Use $(2\pi rhw)$. Calculate 2nd substance A) vol of COGM condensates in the s/pot where r=0.1m, overflow h=2.575m. (Use πr^2h). Site measured

OT303 sludge thickener tank. Calculate A) the volume of COGM condensate in the cone where r=4.5m and h=0.52m. Use $(\pi r^2h/3)$. The tank cone is always full. B) vol of the tank above the cone. Level site measured using a laser. The level varies with transfers. OT303 tank abovethe cone and below the overflow trough is site measured to determine the level from the top of the tank.The max level from the top of the cone to the bottom of the overflow wier is h= 2.42m . The level varies with transfers. Use (πr^2h) and then add this to the vol of the cone. See the COMAH/Haz sub database for changing vols.
04/08/2022 - Sludge Thickener demolished. Inventory transferred to clarifier area.

Calc A) volume of mixed tar and COGM deposits where, l=16.76m, dia =3.05m. h= varies Total tank h= 0.635m. Use crown oil environmental calc.
See COMAH/haz sub database. Site measured. Calculate 2nd substance, B) volume of COGM condensate. Horizontal tank with ellipsoidal ends where l=16.76m, dia =3.05m. h= varies. Use crown oil environmental calc.
See COMAH/haz sub database. Site measured.
01/07/2022 - tank demolition in progress. Inventory decanted into IBCs and being removed from site.
06/09/2022 - Demolished.

Calc A) volume of mixed tar and COGM deposits where, l=16.76m, dia =3.05m. h= varies Total tank h= 3.05m. Use crown oil environmental calc.
See COMAH/haz sub database. Site measured. Calculate 2nd substance, B) volume of COGM condensate. Horizontal tank with ellipsoidal ends where, l=16.76m, dia =3.05m. h= varies. Use crown oil environmental calc.
See COMAH/haz sub database. Site measured.
01/07/2022 - tank demolition in progress. Inventory decanted into IBCs and being removed from site.
06/09/2022 - Demolished.

Calc A) volume of mixed tar and COGM deposits where, l=16.76m, dia =3.05m. h= varies Total tank h= 3.05m. Use crown oil environmental calc.
See COMAH/haz sub database. Site measured. Calculate 2nd substance, B) volume of COGM condensate. Horizontal tank with ellipsoidal ends where l=16.76m, dia =3.05m. h= varies. Use crown oil environmental calc.
See COMAH/haz sub database. Site measured.
01/07/2022 - tank demolition in progress. Inventory decanted into IBCs and being removed from site.
06/09/2022 - Demolished.

Calc A) volume of mixed tar and COGM deposits. Calculate 2nd substance where l=16.76m, dia =3.05m. h= varies Total tank h= 0.27m. Use crown oil environmental calc. See COMAH/haz sub database. Site measured., B) volume of COGM condensate. Horizontal tank with ellipsoidal ends where, l=16.76m, dia =3.05m. h= varies. Use crown oil environmental calc. See COMAH/haz sub database. Site measured. 01/07/2022 - tank demolition in progress. Inventory decanted into IBCs and being removed from site. 06/09/2022 - Demolished.
Estimate arrived at using $\Pi x1.5^2 x700 = 4948m^3$ $4948m^3$ of nitrogen gas converted to tonnes = 6.1899
6 kilometres of main (diameter of 600mm) with assumption of 25% contamination by coke oven gas solid deposits: $\Pi x0.3^2 x6000 = 1696m^3$ $0.75x1696 = 1272m^3$ Offshoots of main estimated to bring total volume to $1500m^3$ $1500m^3$ of nitrogen gas converted to tonnes = 1.8765
04/08/2022 - tranferred to SLEMS area for offsite sale.

Calculations - RCO 1st and 2nd Products								
A $(m)^3$	B $(m)^3$	C $(m)^3$	D $(m)^3$		E $(m)^3$	TOTAL (m^3)	A $(m)^3$	B $(m)^3$

0.158 0.158 0.316 0.158

0.158	0.158				0.316	0.158
0.21	0.21				0.42	0.21
0.21	0.21				0.42	0.21
0.21	0.21				0.42	0.21
0.103					0.103	
0.103					0.103	
0.08					0.080	
0.08					0.080	
0.053					0.053	
0.192					0.192	
0.124					0.124	
0.192					0.192	
0.124					0.124	
0.01						0.010

7.697	0.962	1.264			9.923
7.697	0.962	1.264			9.923
23.303	0.544	0.421			24.268
23.303		0.421			23.724
0.036					0.036
7.29	0.003	0.046	0.43	1.235	9.004
3.43	0.027				3.457
10.568					10.568

0.036		0.036
0.036		0.036
0.19		0.19
30.92		30.92
8.927		8.927
6.12	0.243	6.363
6.12	0.243	6.363
6.12	0.243	6.363
0.021		0.021
2.67	0.03	2.7

0.013	0.009		0.022	0.216
0.013	0.009		0.022	0.216
0.368			0.368	0.442
0.245			0.245	0.957
0.051	0.001		0.052	0.001
0.029	0.002		0.031	0.016
0.026	0.002		0.028	0.02
0.035	0.005		0.04	0.04
0.009			0.009	0.083
0.009	0.005		0.014	0.03
0.009	0.005		0.014	0.03
0.009	0.005		0.014	0.03

0.009	0.005	0.014	0.03
0.29	0.005	0.295	0.036
0.033	0.019	0.052	0.166
0.055		0.055	0.009
0.055		0.055	0.009
0.3		0.3	0.006
0.3		0.3	0.006
0.01		0.01	0.055
0.01		0.01	0.055
0.014		0.014	
0.014		0.014	
0.014		0.014	
0.065		0.065	

0.005	0.008	0.013	0.081
0.005	0.007	0.012	0.071
0.005	0.008	0.013	0.081
11	154	165	
2.27		2.27	16.73
17.52		17.52	104.93
21.86		21.86	100.59

	2.27		2.27	3.06

C (m)³	D (m)³	E (m)³	TOTAL m³

Calculations - SBCO				
a	b	c	d	Total m3
22.23	74.11			96.34
74.11	18.52			92.63

0.158

0.158

0.21

0.21

0.21

18.69	0.252	18.94
18.69	0.252	18.94
18.69	0.252	18.94

0.216

0.216

0.442

0.957

0.001

0.016

0.02

0.04

0.083

0.03

0.03

0.03

0.03

0.036

0.166

0.009

0.009

0.006

0.006

0.055

0.055

0.081

0.071

0.081

16.73

104.93

100.59

3.06

400 **400**

Categories of Dangerous Substances

Hazard Categories in accordance with CLP Regulations	Lower Tier (t)	Upper Tier (t)
Section H - HEALTH HAZARDS		
H1 ACUTE TOXIC Category 1, all exposure routes	5	20
H2 ACUTE TOXIC Category 2, all exposure routes Category 3, inhalation exposure route	50	200
H3 STOT SPECIFIC TARGET ORGAN TOXICITY Single exposure STOT SE Category 1	50	200
Section P - PHYSICAL HAZARDS		
P1a EXPLOSIVES Unstable explosives, or Explosives, Division 1.1, 1.2, 1.3, 1.5 or 1.6, or Substances or mixtures which have explosive properties according to method A.14 of Regulation (EC) No. 440/2008 of 30 May 2008 laying down test methods pursuant to Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and do not belong to the hazard classes Organic peroxides or Self-reactive substances and mixtures	10	50
P1b EXPLOSIVES Explosives, Division 1.4	50	200
P2 FLAMMABLE GASES Flammable gases, Category 1 or 2	10	50
P3a FLAMMABLE AEROSOLS 'Flammable' aerosols Category 1 or 2, containing flammable gases Category 1 or 2 or flammable liquids Category 1	150 (net)	500 (net)
P3b FLAMMABLE AEROSOLS 'Flammable' aerosols Category 1 or 2, not containing flammable gases Category 1 or 2 nor flammable liquids Category 1	5000 (net)	50000 (net)
P4 OXIDISING GASES Oxidising gases, Category 1	50	200
P5a FLAMMABLE LIQUIDS Flammable liquids Category 1, or Flammable liquids Category 2 or 3 maintained at a temperature above their boiling point, or Other liquids with a flash point ≤60°C, maintained at a temperature above their boiling point	10	50

P5b FLAMMABLE LIQUIDS Flammable liquids Category 2 or 3 where particular processing conditions, such as high pressure or high temperature, may create major-accident hazards, or Other liquids with a flashpoint ≤60°C, where processing conditions, such as high pressure or high temperature, may create major-accident hazards	50	200
P5c FLAMMABLE LIQUIDS Flammable liquids, Categories 2 or 3 not covered by P5a and P5b	5000	50000
P6a SELF-REACTIVE SUBSTANCES AND MIXTURES and ORGANIC PEROXIDES Self-reactive substances and mixtures, Type A or B or organic peroxides, Type A or B	10	50
P6b SELF-REACTIVE SUBSTANCES AND MIXTURES and ORGANIC PEROXIDES Self-reactive substances and mixtures, Type C, D, E or F or organic peroxides, Type C, D, E or F	50	200
P7 PYROPHORIC LIQUIDS AND SOLIDS Pyrophoric liquids, Category 1 Pyrophoric solids, Category 1	50	200
P8 OXIDISING LIQUIDS AND SOLIDS Oxidising liquids, Category 1, 2 or 3, or Oxidising Solids, Category 1, 2 or 3	50	200
Section E - ENVIRONMENTAL HAZARDS		
E1 Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1	100	200
E2 Hazardous to the Aquatic Environment in Category Chronic 2	200	500
Section O - OTHER HAZARDS		
O1 Substances of mixtures with hazard statement EUH014	100	500
O2 Substances and mixtures in which contact with water emit flammable gases, Category 1	100	500
O3 Substances or mixtures with hazard statement EUH029	50	200

Present at STSC?

COMAH Dangerous Substances List

Dangerous Substance	CAS Number	Lower Tier (t)	Upper Tier (t)
Ammonium nitrate		5000	10000
Ammonium nitrate		1250	5000
Ammonium nitrate		350	2500
Ammonium nitrate		10	50
Potassium nitrate		5000	10000
Potassium nitrate		1250	5000
Arsenic pentoxide, arsenic (V) acid and/or salts	1303-28-2	1	2
Arsenic trioxide, arsenious (III) acid and/or salts	1327-53-3		0.1
Bromine	7726-95-6	20	100
Chlorine	7782-50-5	10	25
Nickel compounds in inhalable powder form: nickel monoxide, nickel dioxide, nickel sulphide, trinickel sulphide, dinickel trioxide			1
Ethyleneimine	151-56-4	10	20
Fluorine	7782-41-4	10	20
Formaldehyde (concentration ≥90%)	50-00-0	5	50
Hydrogen	1333-74-0	5	50
Hydrogen chloride (liquefied gas)	7647-01-0	25	250
Lead alkyls		5	50
Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas		50	200
Acetylene	74-86-2	5	50
Ethylene oxide	75-21-8	5	50
Propylene oxide	75-56-9	5	50
Methanol	67-56-1	500	5000
4,4'-Methylene bis (2-chloraniline) and/or salts, in powder form	101-14-4		0.01
Methylisocyanate	624-83-9		0.15
Oxygen	7782-44-7	200	2000
2,4-Toluene diisocyanate 2,6-Toluene diisocyanate	585-84-9 91-08-7	10	100
Carbonyl dichloride (phosgene)	75-44-5	0.3	0.75
Arsine (arsenic trihydride)	7784-42-1	0.2	1
Phosphine (phosphorus trihydride)	7803-51-2	0.2	1
Sulphur dichloride	10545-99-0		1
Sulphur trioxide	7446-11-9	15	75

Polychlordibenzofurans and polychlorodibenzodioxins (including TCDD), calculated in TCDD equivalent			0.001
The following CARCINOGENS or the mixtures containing the following carcinogens at concentrations above 5% by weight: 4-Aminobiphenyl and/or its salts, Benzotrichloride, Benzidine and/or salts, Bis (chloromethyl) ether, Chlormethyl methyl ether, 1,2-Dibromoethane, Diethyl sulphate, Dimethyl sulphate, Dimethylcarbamoyl chloride, 1,2-Dibromo-3-chloropropane, 1,2-Dimethylhydrazine, Dimethylnitrosamine, Hexamethylphosphoric triamide, Hydrazine, 2-Naphthylamine and/or salts, 4-Nitrodiphenyl, and 1,3 Propanesultone		0.5	2
Petroleum products and alternative fuels: (a) gasolines and naphthas, (b) kerosenes (including jet fuels), (c) gas oils (including diesel fuels, home heating oils and gas oil blending streams), (d) heavy fuel oils, (e) alternative fuels serving the same purposes and with similar properties as regards flammability and environmental hazards as the products referred to in points (a) to (d)		2500	25000
Anhydrous ammonia	7664-41-7	50	200
Boron trifluoride	7637-07-2	5	20
Hydrogen sulphide	7783-06-4	5	20
Piperidine	110-89-4	50	200
Bix(2-dimethylaminoethyl) (methyl)amine	3030-47-5	50	200
3-(2-Ethylhexyloxy)propylamine	5397-31-9	50	200

Mixtures of sodium hypochlorite classified as Aquatic Acute Category 1 (H400) containing less than 5% active chlorine and not classified under any of the other hazard categories in Part 1 of the Schedule, provided that the mixture in the absence of sodium hyphochlorite would not be classfied as Aquatic Acute Category 1 (H400)		200	500
Propylamine	107-10-8	500	2000
Tert-butyl acrylate	1663-39-4	200	500
2-Methyl-3-butenenitrile	16529-56-9	500	2000
Tetrahydro-3,5-demethyl-1,3,5-thiadiazine-2-thione (Dazomet)	533-74-4	100	200
Methyl acrylate	96-33-3	500	2000
3-Methylpyridine	108-99-6	500	2000
1-Bromo-3-chloropropane	109-70-6	500	2000

Present at STSC?