

POA to Douglas Pipelines

PL1032 3" Condensate Pipeline – Douglas to POA (Piggybacked on PL1030) ending pipeline section plus spools at Douglas DP

PL1033 3" Methanol Pipeline – Douglas to POA (Piggybacked on PL1030) ending pipeline section plus spools at Douglas DP

PL 1030/P908 20" Gas Pipeline – Douglas to POA ending pipeline section plus spools at Douglas DP

Lennox Pipelines

PL1035 16" Gas Export Pipeline – Lennox to Douglas – ending pipeline section plus spools at Douglas DP

PL1034 14" Oil Pipeline – Lennox to Douglas – SSBV plus spools at Lennox and ending pipeline section plus spools at Douglas DP

PL1037 2" Methanol Pipeline - Lennox to Douglas (Piggybacked on PL1034) spools at Lennox and ending pipeline section plus spools at Douglas DP

PL1036 12" Gas Injection DISUSED – Lennox to Douglas – ending pipeline section plus spools at Lennox and ending pipeline section plus spools at Douglas DP

PL1036A 12" Gas Injection – Douglas to Lennox - ending pipeline section plus spools at Douglas DP

PL1038 2" Wax Inhibitor Pipeline - Lennox to Douglas (Piggybacked on decommissioned PL1036) ending pipeline section plus spools at Lennox and ending pipeline section plus spools at Douglas DP

PLU6435 Control Umbilical for PL1034 SSBV (Lennox), from SUTU (LD area) to SSBV (PL1034)

PLU6436 Intrafield Control Umbilicals and SUTU in the Lennox area connecting the PL1034 SSBV with PL1036A SSBV and Lennox

PLU6437 Control Umbilical for PL1035 SSBV (Lennox), from SUTU (LD area) to SSBV (PL1035)

PLU6438 Control Umbilical from Lennox Platform to SUTU (LD area)

PL6426 Power Cable – Hamilton to Lennox - ending sections at Hamilton and at Lennox, as per Subsea Removal Layout around Hamilton and Lennox

PLU6445 Intrafield Control Umbilicals and SUTU in the Douglas DP area connecting the PL1034 SSBV with Douglas DP

Hamilton Pipelines

PL1040 2" Methanol Pipeline - Hamilton to Douglas (Piggybacked on PL1039) - spools at Lennox and ending pipeline section plus spools at Douglas DP

PL1039 20" Gas Export – Hamilton to Douglas – ending pipeline section plus spools at Douglas DP

PL6424 Power Cable – Douglas to Hamilton - ending sections at Douglas DP and at Hamilton, as per Subsea Removal Layout around Douglas DP and Hamilton

Hamilton North Pipelines / Power Cables

PL1041 14" Gas Pipeline – Hamilton North to Douglas – ending pipeline section plus spool at Douglas DP

PL1042 2" Methanol Pipeline - Hamilton North to Douglas (Piggybacked on PL1041) - ending pipeline section plus spool at Douglas DP

PL1860 8" Flexible Gas Pipeline - Hamilton East to Hamilton North - ending section as per Subsea Removal Layout around Hamilton North

PLU1861 Umbilical – Hamilton North to Hamilton East - ending section as per Subsea Removal Layout around Hamilton North

PL6423 Power Cable – Douglas to Hamilton North - ending sections at Douglas DP and at Hamilton North, as per Subsea Removal Layout around Douglas DP and Hamilton North



Split	Materials	Total weight (pipeline and spools) tonnes	Total number of concrete mattresses	Piggybacks	Total length (m)	Diameter (in)	To be removed during partial removal		Remaining		Infrastructure Group	Possible method of removal (technically feasible?)								
							No. Mattresses	Length (m)	No. Mattresses	Length (m)		1.1 F - Reverse Installation Reel Lay	1.2 F - Reverse Installation S Lay	1.3 F - Cut and lift whole pipeline	2.1 P Ma - Cut and lift pipeline ends and exposed sections to allow a minimum of 0.6m ToP	2.2 P Ma - Cut and lift pipeline ends, rockdump exposed section & ends which have <0.6m cover	2.3 P Ma - Cut and lift pipeline ends, trench pipeline to 3m ToP	3.1 P Mi - Cut and lift pipeline ends	4.1 L Ni - No Intervention	
PL1030	PL1030/P908 20" Gas Pipeline – Douglas to POA ending pipeline section plus spools at Douglas DP	Concrete, CTE, Ferrous Metal, Non-Ferrous Metal, Plastics / Rubber	14,721	26	With PL1032 and PL1033 piggybacked	32,120	20	26	185	0	31,935	2. Concrete coated rigid pipelines with piggyback pipeline(s)	N	Y	Y	Y	Y	Y	Y	Y
PL1032	PL1032 3" Condensate Pipeline – Douglas to POA (Piggybacked on PL1030) ending pipeline section plus spools at Douglas DP	N/A	726.77	11 across PL1032 and PL1033	Bundled with PL1033 Piggybacked on PL1030 (close to shore)	32,110	3	11 across PL1032 and PL1033	198	0	31,912	Covered by host	N	Y	Y	Y	Y	Y	Y	Y
PL1033	PL1033 3" Methanol Pipeline – Douglas to POA (Piggybacked on PL1030) ending pipeline section plus spools at Douglas DP	N/A	717.05	11 across PL1032 and PL1033	Bundled with PL1032 Piggybacked on PL1030 (close to shore)	32,110	3	11 across PL1032 and PL1033	207	0	31,903	Covered by host	N	Y	Y	Y	Y	Y	Y	Y
PL1034	PL1034 14" Oil Pipeline – Lennox to Douglas – SSBV plus spools at Lennox and ending pipeline section plus spools at Douglas DP	N/A	7,846.93	40 across PL1034 and PL1037	With PL1037 piggybacked	31,772	14	40 across PL1034 and PL1037	499	0	31,273	2. Concrete coated rigid pipelines with piggyback pipeline(s)	N	Y	Y	Y	Y	Y	Y	Y
PL1035	PL1035 16" Gas Export Pipeline – Lennox to Douglas – ending pipeline section plus spools at Douglas DP	Spool and pipeline approach near Douglas to be removed (inc mattresses). Remainder reused for CCS, spool-connected to new Douglas Platform	Concrete, CTE, Ferrous Metal, Non-Ferrous Metal	12,322.10	17	None	31,772	16	13	256	4	31,516	1. Concrete coated rigid pipelines	N	Y	Y	Y	Y	Y	Y
PL1036	PL1036 12" Gas Injection DISUSED – Lennox to Douglas – ending pipeline section plus spools at Lennox and ending pipeline section plus spools at Douglas DP	N/A	28,634.00	109 across PL1036 and PL1038	With PL1038 piggybacked	31,270	12	94 across PL1036 and PL1038	566	15 across PL1036 and PL1038	30,704	3. Rigid pipelines without concrete coating	N	Y	Y	Y	Y	Y	Y	Y
PL1036A	PL1036A 12" Gas Injection – Douglas to Lennox - ending pipeline section plus spools at Douglas DP	Spool and pipeline approach near Douglas to be removed (inc mattresses). Remainder reused for CCS, spool-connected to new Douglas Platform	Ferrous Metal, Non-Ferrous Metal, Plastics / Rubber	5,349.47	94	None	31,424	12	11	239	83	31,185	3. Rigid pipelines without concrete coating	Y	Y	Y	Y	Y	Y	Y
PL1037	PL1037 2" Methanol Pipeline - Lennox to Douglas (Piggybacked on PL1034) spools at Lennox and ending pipeline section plus spools at Douglas DP	N/A	301.9	40 across PL1034 and PL1037	Piggybacked on PL1034	31,772	2	40 across PL1034 and PL1037	499	0	31,273	Covered by host	N	Y	Y	Y	Y	Y	Y	Y
PL1038	PL1038 2" Wax Inhibitor Pipeline - Lennox to Douglas (Piggybacked on decommissioned PL1036) ending pipeline section plus spools at Lennox and ending pipeline section plus spools at Douglas DP	N/A	375.01	109 across PL1036 and PL1038	Piggybacked on PL1036	31,772	2	94 across PL1036 and PL1038	566	15 across PL1036 and PL1038	31,206	Covered by host	Y	Y	Y	Y	Y	Y	Y	Y
PL6426	Power Cable – Hamilton to Lennox - ending sections at Hamilton and at Lennox, as per Subsea Removal Layout around Hamilton and Lennox	N/A	372.62	27	None	22,180	3	15	141	12	22,039	5. Umbilicals & Power Cable	Y	Y	Y	Y	Y	Y	Y	Y
PL1039	PL1039 20" Gas Export – Hamilton to Douglas – ending pipeline section plus spools at Douglas DP	Spool and pipeline approach near Douglas to be removed (inc mattresses). Remainder reused for CCS, spool-connected to new Douglas Platform	Concrete, CTE, Ferrous Metal, Non-Ferrous Metal, Plastics / Rubber	5,711.38	29 across PL1039 and PL1040	With PL1040 piggybacked	11,207	20	12 across PL1039 and PL1040	229	17 across PL1039 and PL1040	10,978	2. Concrete coated rigid pipelines with piggyback pipeline(s)	N	Y	Y	Y	Y	Y	Y
PL1040	PL1040 2" Methanol Pipeline - Hamilton to Douglas (Piggybacked on PL1039) - spools at Lennox and ending pipeline section plus spools at Douglas DP	To be left in situ as piggybacked to PL1039	Ferrous Metal, Non-Ferrous Metal, Plastics / Rubber	109.53	29 across PL1039 and PL1040	Piggybacked on PL1039	11,207	2	12 across PL1039 and PL1040	339	17 across PL1039 and PL1040	10,759	Covered by host	N	Y	Y	Y	Y	Y	Y
PL6424	Power Cable – Douglas to Hamilton - ending sections at Douglas DP and at Hamilton, as per Subsea Removal Layout around Douglas DP and Hamilton	N/A	193.03	58	None	11,490	3	16	529	42	10,961	5. Umbilicals & Power Cable	Y	Y	Y	Y	Y	Y	Y	Y
PL1041	PL1041 14" Gas Pipeline – Hamilton North to Douglas – ending pipeline section plus spool at Douglas DP	Spool and pipeline approach near Douglas to be removed (inc mattresses). Remainder reused for CCS, spool-connected to new Douglas Platform	Concrete, CTE, Ferrous Metal, Non-Ferrous Metal, Plastics / Rubber	3,733.37	25 across PL1041 and PL1042	With PL1042 piggybacked	14,300	14	7 across PL1041 and PL1042	214	18 across PL1041 and PL1042	14,086	2. Concrete coated rigid pipelines with piggyback pipeline(s)	N	Y	Y	Y	Y	Y	Y
PL1042	PL1042 2" Methanol Pipeline - Hamilton North to Douglas (Piggybacked on PL1041) - ending pipeline section plus spool at Douglas DP	To be left in situ as piggybacked on PL1041	Ferrous Metal, Plastics / Rubber	136.51	25 across PL1041 and PL1042	Piggybacked on PL1041	14,300	2	7 across PL1041 and PL1042	213	18 across PL1041 and PL1042	14,087	Covered by host	N	Y	Y	Y	Y	Y	Y

PL1860	PL1860 8" Flexible Gas Pipeline - Hamilton East to Hamilton North - ending section as per Subsea Removal Layout around Hamilton North	N/A	Ferrous Metal, Plastics / Rubber	475.81	20	None	6,620	8	0	78	20	6,542	4. Flexible pipelines	Y	Y	Y	Y	Y	Y	Y	Y
PLU1861	PLU1861 Umbilical - Hamilton North to Hamilton East - ending section as per Subsea Removal Layout around Hamilton North	N/A	Steel, Copper, Polypropylene	114.2	10	None	6,620	10	0	73	10	6,547	5. Umbilicals & Power Cable	Y	Y	Y	Y	Y	Y	Y	Y
PL6423	Power Cable - Douglas to Hamilton North - ending sections at Douglas DP and at Hamilton North, as per Subsea Removal Layout around Douglas DP and Hamilton North	N/A	Steel, copper, polypropylene, bitumen	244.61	20	None	14,560	3	19	322	1	14,238	5. Umbilicals & Power Cable	Y	Y	Y	Y	Y	Y	Y	Y
PLU6435	Control Umbilical for PL1034 SSBV (Lennox), from SUTU (LD area) to SSBV (PL1034)	N/A	Steel, nylon, polypropylene, copper	0.05	Included in PL1034	None	3	4	Included in PL1034	Included in PL1034	0	0	5. Umbilicals & Power Cable	Y	Y	Y	Y	Y	Y	Y	Y
PLU6436	Intrafield Control Umbilicals and SUTU in the Lennox area connecting the PL1034 SSBV with PL1036A SSBV and Lennox	N/A	Steel, nylon, polypropylene, copper	2.75	Included in PL1036A	None	154	4	Included in PL1036A	Included in PL1036A	0	0	5. Umbilicals & Power Cable	Y	Y	Y	Y	Y	Y	Y	Y
PLU6437	Control Umbilical for PL1035 SSBV (Lennox), from SUTU (LD area) to SSBV (PL1035)	N/A	Steel, nylon, polypropylene, copper	0.7	Included in PL1035	None	38	4	Included in PL1035	Included in PL1035	0	0	5. Umbilicals & Power Cable	Y	Y	Y	Y	Y	Y	Y	Y
PLU6438	Control Umbilical from Lennox Platform to SUTU (LD area)	N/A	Steel, nylon, polypropylene, copper	2.3	Included in PL1034 and 1036A	None	129	4	Included in PL1034 and 1036A	Included in PL1034 and 1036A	0	0	5. Umbilicals & Power Cable	Y	Y	Y	Y	Y	Y	Y	Y
PLU6445	Intrafield Control Umbilicals and SUTU in the Douglas DP area connecting the PL1034 SSBV with Douglas DP	N/A	Steel, nylon, polypropylene, copper	2.11	Included in PL1034	None	205	3	Included in PL1034	Included in PL1034	0	0	5. Umbilicals & Power Cable	Y	Y	Y	Y	Y	Y	Y	Y

Qualitative Criteria

Quantitative Criteria

Attractive	3
Acceptable	2
Unattractive	1
Showstopper	0



Group 1 Concrete coated rigid pipelines										
1. Full Removal Options (F)			2. Partial removal - Major Intervention (P Ma)			3. Partial removal - Minimum Intervention (P Mi)	4. Leave In-situ Option - No Intervention (L Ni)			
Option 1.1	Option 1.2	Option 1.3	Option 2.1	Option 2.2	Option 2.3	Option 3.1	Option 4.1			
Reverse Installation Reel Lay	Reverse Installation S Lay	Cut and lift whole pipeline	Cut and lift pipeline ends and exposed sections to allow a minimum of 0.6m ToP	Cut and lift pipeline ends, rockdump exposed section & ends which have <0.6m cover	Cut and lift pipeline ends, trench pipeline to 3m ToP	Cut and lift pipeline ends	No Intervention			
Criteria	Environment	Qualitative Criteria	Acceptable	Acceptable	Acceptable	Acceptable	Attractive	Attractive		
	Environment	Description	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Additional vessel compared to Reel Lay Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Additional vessel compared to Reel Lay Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Additional impacts from obtaining and deploying rockdump material. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Additional trenching which creates additional seabed disturbance compared to 0.6m. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal and partial removal with major intervention due to short duration and less benthic disturbance. Staged trench re-opening may be required as pipelines are buried, causing additional seabed disturbance	Positive impact to the environment due to already established ecological communities. This would be valid for the PL1031, which is the sole pipeline section / spool planned to leave in situ for the Phase 1 Decommissioning
	Safety	Qualitative Criteria	Attractive	Acceptable	Unattractive	Acceptable	Acceptable	Acceptable	Acceptable	
	Safety	Description	Automated or semi-automated process on vessel; little or no diving required; hazards of lifting activities	Automated or semi-automated process on vessel; little or no diving required; hazards of lifting activities Additional vessel compared to Reel Lay	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities (potentially more than Reel and S Lay). Additional vessel compared to Reel lay	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities. Additional risks from rockdump handling both onshore and offshore.	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities.	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities. Lower risk than for full removal or partial removal with major intervention due to short duration.	No planned safety risks . However, remedial activities might be required in the future, associated with residual equipment left in-situ.
Economic	Qualitative Criteria	Attractive	Acceptable	Unattractive	Attractive	Attractive	Acceptable	Acceptable		
Economic	Description	Single vessel	Main vessel plus barge; slower than Reel lay but quicker than Cut and lift	Main vessel plus barge; slower than S lay and Reel lay. Deburial would be needed	Main vessel plus barge. Quicker than full removal	Main vessel plus barge. Quicker than full removal. No trenching required but rockdump needed. Time and cost maybe similar to option 2.1	Main vessel plus barge. Quicker than full removal. Additional time and cost required for extra trenching.	Main vessel plus barge. Quicker than full removal and partial removal with major intervention.	Minimal planned costs associated with future monitoring. However, remedial costs might be required in the future, associated with residual equipment left in-situ.	
Technical	Qualitative Criteria	Showstopper	Acceptable	Unattractive	Attractive	Attractive	Unattractive	Attractive		
Technical	Description	Not feasible due to concrete coating and large diameter	Never used in North Sea but is feasible for longer sections, acceptable for large diameter concrete coated pipelines. Note - Reverse S Lay is not feasible for entire pipeline length due to catenary action towards end of section. A length of around 300m from the pipeline end would need to be removed by cut and lift.	Feasible but would require deburial	Feasible. No significant technical challenges identified.	Feasible. No significant technical challenges identified.	Feasible but would require additional trenching. Not considered necessary due to sediment stability.	Feasible. No significant technical challenges identified.	NA	
	Qualitative Criteria	Acceptable	Acceptable	Acceptable	Attractive	Attractive	Attractive	Showstopper	Showstopper	

Societal	Description	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Remote operation near existing facilities, unlikely to impact other users	Remote operation near existing facilities, unlikely to impact other users	Remote operation near existing facilities, unlikely to impact other users	Not permissible under OPRED guidelines (sections of pipe may be left exposed without treatment).	Not permissible under OPRED guidelines (sections of pipe may be left exposed without treatment).
	Qualitative Criteria	Showstopper	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Showstopper	Showstopper
Potential knock-ons for future decomm	Description	Not applicable - not feasible	None identified.	None identified.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Not applicable - not permissible	Not applicable - not permissible
	Quantitative Criteria	0	10	7	14	13	10	0	0



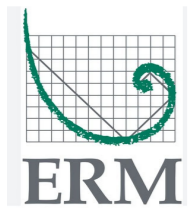
Group 2										
Concrete coated rigid pipelines with piggyback pipeline(s)										
1. Full Removal Options (F)			2. Partial removal - Major Intervention (P Ma)			3. Partial removal - Minimum Intervention (P Mi)	4. Leave In-situ Option - No Intervention (L Ni)			
Option 1.1	Option 1.2	Option 1.3	Option 2.1	Option 2.2	Option 2.3	Option 3.1	Option 4.1			
Reverse Installation Reel Lay	Reverse Installation S Lay	Cut and lift whole pipeline	Cut and lift pipeline ends and exposed sections to allow a minimum of 0.6m ToP	Cut and lift pipeline ends, rockdump exposed section & ends which have <0.6m cover	Cut and lift pipeline ends, trench pipeline to 3m ToP	Cut and lift pipeline ends	No Intervention			
Criteria	Environment	Qualitative Criteria	Attractive	Acceptable	Acceptable	Attractive	Attractive	Attractive		
		Description	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Additional vessel compared to Reel Lay. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Additional vessel compared to Reel Lay. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Additional impacts from obtaining and deploying rockdump material. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Additional trenching which creates additional seabed disturbance compared to 0.6m. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Positive impact to the environment due to already established ecological communities.	
	Safety	Qualitative Criteria	Attractive	Acceptable	Unattractive	Acceptable	Acceptable	Acceptable	Acceptable	
		Description	Automated or semi-automated process on vessel; little or no diving required; hazards of lifting activities	Automated or semi-automated process on vessel; little or no diving required; hazards of lifting activities Additional vessel compared to Reel Lay	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities (potentially more than Reel and S Lay). Additional vessel compared to Reel lay	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities. Additional risks from rockdump handling both onshore and offshore.	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities.	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities. Lower risk than for full removal or partial removal with major intervention due to short duration.	No planned safety risks . However, remedial activities might be required in the future, associated with residual equipment left in-situ.
	Economic	Qualitative Criteria	Attractive	Acceptable	Unattractive	Attractive	Attractive	Acceptable	Acceptable	
	Description	Single vessel	Main vessel plus barge; slower than Reel lay but quicker than Cut and lift	Main vessel plus barge; slower than S lay and Reel lay. Deburial would be needed	Main vessel plus barge. Quicker than full removal	Main vessel plus barge. Quicker than full removal. No trenching required but rockdump needed. Time and cost maybe similar to option 2.1	Main vessel plus barge. Quicker than full removal. Additional time and cost required for extra trenching.	Main vessel plus barge. Quicker than full removal and partial removal with major intervention.	Minimal planned costs associated with future monitoring. However, remedial costs might be required in the future, associated with residual equipment left in-situ.	
Technical	Qualitative Criteria	Showstopper	Acceptable	Unattractive	Attractive	Attractive	Unattractive	Attractive		
	Description	Not feasible due to concrete coating and large diameter	Never used in North Sea but is feasible for longer sections, acceptable for large diameter concrete coated pipelines. Note - Reverse S Lay is not feasible for entire pipeline length due to catenary action towards end of section. A length of around 300m from the pipeline end	Feasible but would require deburial	Feasible. No significant technical challenges identified.	Feasible. No significant technical challenges identified.	Feasible but would require additional trenching. Not considered necessary due to sediment stability.	Feasible. No significant technical challenges identified.	NA	
Societal	Qualitative Criteria	Acceptable	Acceptable	Acceptable	Attractive	Attractive	Attractive	Showstopper		
	Description	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Remote operation near existing facilities, unlikely to impact other users	Remote operation near existing facilities, unlikely to impact other users	Remote operation near existing facilities, unlikely to impact other users	Not permissible under OPRED guidelines (sections of pipe may be left exposed without treatment).	Not permissible under OPRED guidelines (sections of pipe may be left exposed without treatment).	
	Qualitative Criteria	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Showstopper		
	Description									

Potential knock-ons for future decomm	Description	Not applicable - not feasible	None identified. Any piggybacked pipes would be removed at same time.	None identified. Any piggybacked pipes would be removed at same time.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options. Any piggybacked pipes left attached would be subject to same treatment and depth of cover.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options. Any piggybacked pipes left attached would be subject to same treatment and depth of cover.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options. Any piggybacked pipes left attached would be subject to same treatment and depth of cover.	Not applicable - not permissible	Not applicable - not permissible
		Quantitative Criteria	0	10	7	14	13	10	0



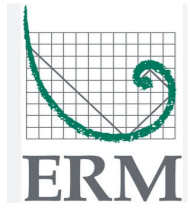
Group 3									
Rigid pipelines without concrete coating									
1. Full Removal Options (F)				2. Partial removal - Major Intervention (P Ma)			3. Partial removal - Minimum Intervention (P Mi)	4. Leave In-situ Option - No Intervention (L Ni)	
Option 1.1	Option 1.2	Option 1.3	Option 2.1	Option 2.2	Option 2.3	Option 3.1	Option 4.1		
Reverse Installation Reel Lay	Reverse Installation S Lay	Cut and lift whole pipeline	Cut and lift pipeline ends and exposed sections to allow a minimum of 0.6m ToP	Cut and lift pipeline ends, rockdump exposed section & ends which have <0.6m cover	Cut and lift pipeline ends, trench pipeline to 3m ToP	Cut and lift pipeline ends	No Intervention		
Criteria	Environment	Qualitative Criteria: Attractive Description: Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. It is unlikely that a rigid pipeline recovered using this method could be reused. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Qualitative Criteria: Acceptable Description: Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Additional vessel compared to Reel Lay. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Qualitative Criteria: Acceptable Description: Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Additional vessel compared to Reel Lay. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Qualitative Criteria: Attractive Description: Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Qualitative Criteria: Acceptable Description: Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Additional impacts from obtaining and deploying rockdump material. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Qualitative Criteria: Acceptable Description: Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Additional trenching which creates additional seabed disturbance compared to 0.6m. Staged trench re-opening would be required as pipelines are buried, causing additional seabed disturbance	Qualitative Criteria: Attractive Description: Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal and partial removal with major intervention due to short duration and less benthic disturbance. Staged trench re-opening may be required as pipelines are buried, causing additional seabed disturbance	Qualitative Criteria: Attractive Description: Positive impact to the environment due to already established ecological communities.
	Safety	Qualitative Criteria: Attractive Description: Automated or semi-automated process on vessel; little or no diving required; hazards of lifting activities	Qualitative Criteria: Acceptable Description: Automated or semi-automated process on vessel; little or no diving required; hazards of lifting activities Additional vessel compared to Reel Lay	Qualitative Criteria: Unattractive Description: Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities (potentially more than Reel and S Lay). Additional vessel compared to Reel lay	Qualitative Criteria: Acceptable Description: Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities	Qualitative Criteria: Acceptable Description: Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities. Additional risks from rockdump handling both onshore and offshore.	Qualitative Criteria: Acceptable Description: Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities.	Qualitative Criteria: Attractive Description: Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities. Lower risk than for full removal or partial removal with major intervention due to short duration.	Qualitative Criteria: Acceptable Description: No planned safety risks . However, remedial activities might be required in the future, associated with residual equipment left in-situ.
	Economic	Qualitative Criteria: Attractive Description: Single vessel	Qualitative Criteria: Acceptable Description: Main vessel plus barge; slower than Reel lay but quicker than Cut and lift	Qualitative Criteria: Unattractive Description: Main vessel plus barge; slower than S lay and Reel lay. Deburial would be needed	Qualitative Criteria: Attractive Description: Main vessel plus barge. Quicker than full removal	Qualitative Criteria: Attractive Description: Main vessel plus barge. Quicker than full removal. No trenching required but rockdump needed. Time and cost maybe similar to option 2.1	Qualitative Criteria: Acceptable Description: Main vessel plus barge. Quicker than full removal. Additional time and cost required for extra trenching.	Qualitative Criteria: Attractive Description: Main vessel plus barge. Quicker than full removal and partial removal with major intervention.	Qualitative Criteria: Acceptable Description: Minimal planned costs associated with future monitoring. However, remedial costs might be required in the future, associated with residual equipment left in-situ.
	Technical	Qualitative Criteria: Unattractive Description: Feasible but may not be desirable due to diameter of pipe	Qualitative Criteria: Acceptable Description: Never used in North Sea but is feasible for longer sections, acceptable for large diameter concrete coated pipelines. Note - Reverse S Lay is not feasible for entire pipeline length due to catenary action towards end of section. A length of around 300m from the	Qualitative Criteria: Unattractive Description: Feasible but would require deburial	Qualitative Criteria: Attractive Description: Feasible. No significant technical challenges identified.	Qualitative Criteria: Attractive Description: Feasible. No significant technical challenges identified.	Qualitative Criteria: Unattractive Description: Feasible but would require additional trenching. Not considered necessary due to sediment stability.	Qualitative Criteria: Attractive Description: Feasible. No significant technical challenges identified.	Qualitative Criteria: Attractive Description: NA
	Societal	Qualitative Criteria: Acceptable Description: Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Qualitative Criteria: Acceptable Description: Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Qualitative Criteria: Acceptable Description: Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Qualitative Criteria: Attractive Description: Remote operation near existing facilities, unlikely to impact other users	Qualitative Criteria: Attractive Description: Remote operation near existing facilities, unlikely to impact other users	Qualitative Criteria: Attractive Description: Remote operation near existing facilities, unlikely to impact other users	Qualitative Criteria: Showstopper Description: Not permissible under OPRED guidelines.	Qualitative Criteria: Showstopper Description: Not permissible under OPRED guidelines.

Potential knock-ons for future decomm	Qualitative Criteria	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Showstopper	Showstopper
	Description	None identified	None identified	None identified	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Not applicable - not permissible	Not applicable - not permissible
	Quantitative Criteria	12	10	7	14	13	10	0	0



Group 4 Flexible pipelines									
1. Full Removal Options (F)			2. Partial removal - Major Intervention (P Ma)			3. Partial removal - Minimum Intervention (P Mi)	4. Leave In-situ Option - No Intervention (L Ni)		
Option 1.1	Option 1.2	Option 1.3	Option 2.1	Option 2.2	Option 2.3	Option 3.1	Option 4.1		
Reverse Installation Reel Lay	Reverse Installation S Lay	Cut and lift whole pipeline	Cut and lift pipeline ends and exposed sections to allow a minimum of 0.6m ToP	Cut and lift pipeline ends, rockdump exposed section & ends which have <0.6m cover	Cut and lift pipeline ends, trench pipeline to 3m ToP	Cut and lift pipeline ends	No Intervention		
Criteria	Environment	Qualitative Criteria	Attractive	Acceptable	Acceptable	Attractive	Attractive	Attractive	
	Description	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. It is possible that a flexible pipeline recovered using this method could be reused. Staged trench re-opening may be required where pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Additional vessel compared to Reel Lay. Staged trench re-opening may be required where pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Additional vessel compared to Reel Lay. Staged trench re-opening may be required where pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Staged trench re-opening may be required where pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Additional impacts from obtaining and deploying rockdump material. Staged trench re-opening may be required where pipelines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Additional trenching which creates additional seabed disturbance compared to 0.6m. Staged trench re-opening may be required where pipelines are buried, causing additional seabed disturbance	Positive impact to the environment due to already established ecological communities.	
	Safety	Qualitative Criteria	Attractive	Acceptable	Unattractive	Acceptable	Acceptable	Acceptable	Acceptable
	Description	Automated or semi-automated process on vessel; little or no diving required; hazards of lifting activities	Automated or semi-automated process on vessel; little or no diving required; hazards of lifting activities Additional vessel compared to Reel Lay	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities (potentially more than Reel and S Lay). Additional vessel compared to Reel lay	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities. Additional risks from rockdump handling both onshore and offshore.	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities.	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities. Lower risk than for full removal or partial removal with major intervention due to short duration.	No planned safety risks . However, remedial activities might be required in the future, associated with residual equipment left in-situ.
	Economic	Qualitative Criteria	Attractive	Acceptable	Unattractive	Attractive	Attractive	Acceptable	Acceptable
Description	Single vessel	Main vessel plus barge; slower than Reel lay but quicker than Cut and lift	Main vessel plus barge; slower than S lay and Reel lay. Deburial would be needed	Main vessel plus barge. Quicker than full removal	Main vessel plus barge. Quicker than full removal. No trenching required but rockdump needed. Time and cost maybe similar to option 2.1	Main vessel plus barge. Quicker than full removal. Additional time and cost required for extra trenching.	Main vessel plus barge. Quicker than full removal and partial removal with major intervention.	Minimal planned costs associated with future monitoring. However, remedial costs might be required in the future, associated with residual equipment left in-situ.	
Technical	Qualitative Criteria	Attractive	Acceptable	Unattractive	Attractive	Attractive	Unattractive	Attractive	
Description	Feasible. Reverse of the installation process	Never used in North Sea but is feasible for longer sections, acceptable for large diameter pipelines	Feasible but would require deburial	Feasible. No significant technical challenges identified.	Feasible. No significant technical challenges identified.	Feasible but would require additional trenching. Not considered necessary due to sediment stability.	Feasible. No significant technical challenges identified.	NA	
Societal	Qualitative Criteria	Acceptable	Acceptable	Acceptable	Attractive	Attractive	Attractive	Showstopper	
Description	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Remote operation near existing facilities, unlikely to impact other users	Remote operation near existing facilities, unlikely to impact other users	Remote operation near existing facilities, unlikely to impact other users	Unlikely to be permissible under OPRED guidelines. "Expected to be removed"	Unlikely to be permissible under OPRED guidelines. "Expected to be removed"	
Qualitative Criteria	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Showstopper	Showstopper	

Potential knock- ons for future decomm	Description	None identified	None identified	None identified	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Not applicable - not permissible	Not applicable - not permissible
		Quantitative Criteria	14	10	7	14	13	10	0



Group 5 Umbilicals & Power Cable									
1. Full Removal Options (F)				2. Partial removal - Major Intervention (P Ma)			3. Partial removal - Minimum Intervention (P Mi)	4. Leave In-situ Option - No Intervention (L Ni)	
Option 1.1	Option 1.2	Option 1.3	Option 2.1	Option 2.2	Option 2.3	Option 3.1	Option 4.1		
Reverse Installation Reel Lay	Reverse Installation S Lay	Cut and lift whole pipeline	Cut and lift pipeline ends and exposed sections to allow a minimum of 0.6m ToP	Cut and lift pipeline ends, rockdump exposed section & ends which have <0.6m cover	Cut and lift pipeline ends, trench pipeline to 3m ToP	Cut and lift pipeline ends	No Intervention		
Criteria	Environment	Qualitative Criteria	Attractive	Acceptable	Acceptable	Attractive	Attractive	Attractive	
	Description	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Staged trench re-opening may be required where lines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Additional vessel compared to Reel Lay. Staged trench re-opening may be required where lines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Additional vessel compared to Reel Lay. Staged trench re-opening may be required where lines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Staged trench re-opening may be required where lines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal due to short duration and less benthic disturbance. Additional impacts from obtaining and deploying rockdump material. Staged trench re-opening may be required where lines are buried, causing additional seabed disturbance	Impact to benthic biota, potential disturbance to marine and avi fauna; greenhouse gas and air quality emissions from vessels and recycling, potential spills and routine vessel emissions. Less impact than for full removal and partial removal with major intervention due to short duration and less benthic disturbance. Staged trench re-opening may be required where lines are buried, causing additional seabed disturbance	Positive impact to the environment due to already established ecological communities.	
	Safety	Qualitative Criteria	Attractive	Acceptable	Unattractive	Acceptable	Acceptable	Acceptable	Acceptable
	Description	Automated or semi-automated process on vessel; little or no diving required; hazards of lifting activities	Automated or semi-automated process on vessel; little or no diving required; hazards of lifting activities Additional vessel compared to Reel Lay	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities (potentially more than Reel and S Lay). Additional vessel compared to Reel lay	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities. Additional risks from rockdump handling both onshore and offshore.	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities.	Automated or semi-automated process on vessel; potential diving and ROV activity; hazards of lifting activities. Lower risk than for full removal or partial removal with major intervention due to short duration.	No planned safety risks . However, remedial activities might be required in the future, associated with residual equipment left in-situ.
	Economic	Qualitative Criteria	Attractive	Acceptable	Unattractive	Attractive	Attractive	Acceptable	Acceptable
	Description	Single vessel	Main vessel plus barge; slower than Reel lay but quicker than Cut and lift	Main vessel plus barge; slower than S lay and Reel lay. Deburial would be needed	Main vessel plus barge. Quicker than full removal	Main vessel plus barge. Quicker than full removal. No trenching required but rockdump needed. Time and cost maybe similar to option 2.1	Main vessel plus barge. Quicker than full removal. Additional time and cost required for extra trenching.	Main vessel plus barge. Quicker than full removal and partial removal with major intervention.	Minimal planned costs associated with future monitoring. However, remedial costs might be required in the future, associated with residual equipment left in-situ.
Technical	Qualitative Criteria	Attractive	Acceptable	Unattractive	Attractive	Attractive	Unattractive	Attractive	
Description	Feasible and may allow re-use and recycling	Feasible	Feasible but would require deburial	Feasible. No significant technical challenges identified.	Feasible. No significant technical challenges identified.	Feasible but would require additional trenching. Not considered necessary due to sediment stability.	Feasible. No significant technical challenges identified.	NA	
Societal	Qualitative Criteria	Acceptable	Acceptable	Acceptable	Attractive	Attractive	Attractive	Showstopper	
Description	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Temporary activity, mostly in remote sea locations, unlikely to disturb other sea users	Remote operation near existing facilities, unlikely to impact other users	Remote operation near existing facilities, unlikely to impact other users	Remote operation near existing facilities, unlikely to impact other users	Unlikely to be permissible under OPRED guidelines. "Expected to be removed"	Unlikely to be permissible under OPRED guidelines. "Expected to be removed"	
Qualitative Criteria	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Showstopper	Showstopper	

Potential knock-ons for future decomm	Description	None identified	None identified	None identified	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Sufficient length of pipe (and spools) should be removed at partial decommissioning to enable future access of potentially larger vessel(s) than were involved in partial decommissioning and allow full range of removal options.	Not applicable - not permissible	Not applicable - not permissible
	Quantitative Criteria	14	10	7	14	13	10	0	0