



**Appendix M – Combined Matrix**

1.0 Cultural Heritage		Ferrybank	Kilbride	Shelton Abbey
1.1 Cultural Heritage - Sites				
1.1.4	Potential to impact (direct/indirect) on CH sites (previously unrecorded sites)	Imperceptible	Slight - greenfield site	Imperceptible
1.2 Cultural Heritage - Route Corridors		Ferrybank	Kilbride	Shelton Abbey
1.2.4	Potential to impact on CH sites	Imperceptible	Moderate - corridor through greenfield lands	Moderate - corridor through greenfield lands
1.3 Cultural Heritage - Outfalls		Ferrybank	Kilbride	Shelton Abbey
2.0 Landscape & Visual		Ferrybank	Kilbride	Shelton Abbey
2.1 Landscape & Visual - Sites				
2.1.4	Potential to impact on the character of the landscape	Imperceptible	Slight - existing 'rural' character	Imperceptible
2.1.7	Potential to impact on views from dwellings / local roads	Moderate - Closest site to Arklow town centre	Slight - Elevated site visible from surrounds	Imperceptible
2.1.8	Potential to impact on views from M11 motorway	Imperceptible	Imperceptible	Slight - visible from M11 bridge (northbound)
2.1.9	Potential to impact on views from Dublin - Rosslare rail line	Imperceptible	Imperceptible	Slight - visible from railway line
2.2 Landscape & Visual - Route Corridors - Pipelines		Ferrybank	Kilbride	Shelton Abbey
2.2.9	Potential to disrupt landscape structure (treelines / hedgerows / field pattern etc.)	Imperceptible	Slight - Changes during construction phase along route	Slight - Changes during construction phase along route
2.3 Landscape & Visual - Outfalls (Landward side)		Ferrybank	Kilbride	Shelton Abbey
3.0 Ecology		Ferrybank	Kilbride	Shelton Abbey
3.1 Ecology - Sites				
3.1.2	Potential to impact on Habitats Directive Annex II listed species in freshwater	Imperceptible	Imperceptible	Slight - Disturbance of previously land-filled areas may have a potential to mobilise contaminants that could enter watercourses connected to Arklow Town Marsh and the Avoca river and may require additional geotechnical site investigation
3.1.4	Potential to impact on pNHAs and Conservation Zones	Imperceptible	Imperceptible	Slight - Disturbance of previously land-filled areas may have a potential to mobilise contaminants that could enter watercourses connected to Arklow Town Marsh and the Avoca river and may require additional geotechnical site investigation
3.1.5	Potential to impact upon ecological corridors, nature development area or high value habitats	Imperceptible	Slight - Arklow Town and Environs Development Plan 2011-2017 Objectives: BD1, BD2, BD3, BD4, BD5, BD6 are considered to be capable of being implemented given the size of individual field areas within the land parcel.	Imperceptible

3.2	Ecology - Route Corridors/Pipelines	Ferrybank	Kilbride	Shelton Abbey
3.2.2	Potential to impact on Habitats Directive Annex II listed species in freshwater	Imperceptible	Imperceptible	Slight - Disturbance of previously land-filled areas may have a potential to mobilise contaminants that could enter watercourses connected to Arklow Town Marsh and the Avoca river and may require additional geotechnical site investigation
3.2.4	Potential to impact on pNHAs and Conservation Zones	Imperceptible	Slight - Arklow Town and Environs Development Plan 2011-2017 Objectives BD2, WS2 require avoidance of construction within Arklow Town Marsh, and avoidance of hydrological impacts on the Marsh. Disturbance of previously land-filled areas may have a potential to mobilise contaminants that could enter watercourses connected to Arklow Town Marsh and the Avoca river and may require additional geotechnical site investigation	Slight - Arklow Town and Environs Development Plan 2011-2017 Objectives BD2, WS2 require avoidance of construction within Arklow Town Marsh, and avoidance of hydrological impacts on the Marsh. Disturbance of previously land-filled areas may have a potential to mobilise contaminants that could enter watercourses connected to Arklow Town Marsh and the Avoca river and may require additional geotechnical site investigation
3.3	Ecology - Outfalls	Ferrybank	Kilbride	Shelton Abbey
3.3.7	Potential to impact on breeding habitat for Annex 1 bird species	Imperceptible	Slight - Kingfisher survey of river banks near outfall location required at detailed design stage	Slight - Kingfisher survey of river banks near outfall location required at detailed design stage
4.0	Hydrology	Ferrybank	Kilbride	Shelton Abbey
4.1	Hydrology - Sites	Ferrybank	Kilbride	Shelton Abbey
4.2	Hydrology - Route Corridors	Ferrybank	Kilbride	Shelton Abbey
4.2.4	Potential Impact on ecologically important and designated sites.	Imperceptible	Slight - Arklow Marsh - pNHA	Slight - Arklow Marsh - pNHA
4.3	Hydrology - Outfalls	Ferrybank	Kilbride	Shelton Abbey
5.0	Hydrogeology	Ferrybank	Kilbride	Shelton Abbey
5.1	Hydrogeology - Sites	Ferrybank	Kilbride	Shelton Abbey
5.1.2	Vulnerability Classification - potential for groundwater contamination	Imperceptible - "Low"	Moderate - "High" to "Extreme" to "Rock at near Surface or Karst"	Slight - "Moderate"
5.2	Hydrogeology - Route Corridors	Ferrybank	Kilbride	Shelton Abbey
5.3	Hydrogeology - Outfalls	Ferrybank	Kilbride	Shelton Abbey

6.0 Soils and Geology		Ferrybank	Kilbride	Shelton Abbey
6.1 Soils and Geology - Sites		Ferrybank	Kilbride	Shelton Abbey
6.1.2	Potential to interact with contaminated land	Moderate - Chance of encountering heavy metals & PAH Compounds	Imperceptible - Greenfield Site	Slight - Brownfield Site. History of industrial activities.
6.1.4	Potential to encounter shallow bedrock during construction (interactions with other disciplines during construction - noise, dust etc)	Imperceptible- Bedrock estimated at 10m bgl	Moderate - Outcrop in western portion of the site	Imperceptible- Bedrock estimated at 10m bgl
6.1.6	Potential to encounter soft ground	Moderate - Quaternary mapping has noted the subsoil to be an alluvium gravel deposit consistent with the nature of soils located near rivers	Imperceptible - No alluvial deposits mapped within Site	Imperceptible - No alluvial deposits mapped within Site
6.1.7	Soils Types	Made Ground	Acidic deep poorly drained mineral	Made Ground
6.1.8	Sub Soil Types	Made Ground/Alluvial Gravel Deposits	Sandstone and shale till	Made Ground
6.1.9	Depth to rock	~10m	0 - 10m	5-10m
6.2 Soils and Geology - Route Corridors		Ferrybank	Kilbride	Shelton Abbey
6.2.2	Potential to interact with contaminated land	Slight - Chance of encountering heavy metals & PAH Compounds (associated with made ground)	Significant - Pipeline route near existing EPA landfill site	Significant - Pipeline route near existing EPA landfill site
6.2.4	Potential to encounter shallow bedrock during construction (interactions with other disciplines during construction - noise, dust etc)	Imperceptible	Moderate - Outcrop shown on GSI Mapping in the vicinity of M11 motorway	Moderate - Outcrop shown on GSI Mapping in the vicinity of M11 motorway
6.2.6	Potential to encounter soft ground	Slight - Quaternary mapping has noted the subsoil to be an alluvium gravel deposit consistent with the nature of soils located near rivers	Moderate - Quaternary mapping has noted the subsoil to be an alluvium gravel deposit consistent with the nature of soils located near rivers/marsh	Moderate - Quaternary mapping has noted the subsoil to be an alluvium gravel deposit consistent with the nature of soils located near rivers/marsh
6.3 Soils and Geology - Outfalls		Ferrybank	Kilbride	Shelton Abbey
7.0 Agronomy & Landuse - Sites		Ferrybank	Kilbride	Shelton Abbey
7.1	Approximate % Reduction in overall farm holding	Imperceptible	Slight - approx. 6.5% reduction	Imperceptible
7.2	Farming Enterprise	Imperceptible - no farming enterprise	Moderate - farming enterprise	Imperceptible - no farming enterprise
7.4	Land Quality	Imperceptible - Poor Land Quality	Slight - Good Land Quality	Imperceptible - Poor Land Quality
7.5	Severance based on site location within overall land holdings	Imperceptible	Slight	Imperceptible
7.6	Potential Impacts on landholdings	Imperceptible	Reduction in farm size	Imperceptible
7.7	Crop rotation practiced	No	Yes	No
7.8	Overall Impact	Imperceptible	Moderate	Imperceptible
8.0 Noise & Vibration		Ferrybank	Kilbride	Shelton Abbey
8.1	Potential for Construction phase noise impact at Sensitive receptors	Moderate - 90 dwellings (PIR Weighted) within 300 m	Imperceptible - 0 dwellings (PIR Weighted) within 300 m	Slight - 6 dwellings (PIR Weighted) within 300 m
8.3	Existing Ambient Noise Climate in the Area (significant noise sources)	Close to Arklow Town Centre	Relatively rural farmland area. Borders M11 motorway	Relatively rural farmland area. Borders M11 motorway
9.0 Air and Odour		Ferrybank	Kilbride	Shelton Abbey
9.1	Potential for Construction Phase Air Quality Impact at Sensitive Receptors	Moderate - Approx. 339 Dwellings within 500m of Site Boundary	Slight - Approx. 5 Dwellings within 500m of Site Boundary	Slight - Approx. 10 Dwellings within 500m of Site Boundary

9.3	Potential for Odour Impacts at Operational phase	Moderate - Approx. 339 Dwellings within 500m of Site Boundary	Slight - Approx. 5 Dwellings within 500m of Site Boundary	Slight - Approx. 10 Dwellings within 500m of Site Boundary
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10.0	People and Communities - Sites	Ferrybank	Kilbride	Shelton Abbey
10.1	Number of residential & commercial buildings 100-200m from site boundary	Slight - Approx. 13	Imperceptible - 0	Slight - 1
10.1	Number of residential & commercial buildings within 500m from site boundary	Moderate - Approx. 339	Slight - Approx. 5	Slight - Approx. 10
10.1	Potential to impact on known community amenities and facilities within 1km from site boundary.	Moderate - Arklow leisure centre, skate park/BMX, running track & playing pitches is c. 200 m to the north and the golf links c. 500 m to the south. Bridgewater shopping centre is located c. 520 m from the boundary of the site while the Marina Village residential development lies 200 m from the site boundary	Slight - The Kilbride historic graveyard is within 500m of this site and the Arklow Town Marsh is c. 600 m to the south.	Slight - The Kilbride historic graveyard lies c. 750 m North East of this site and the Arklow Town Marsh is c. 750 m to the East.
10.1	Potential to impact on areas of Significant Population Densities	Slight	Imperceptible	Imperceptible
11.0	Traffic - Sites	Ferrybank	Kilbride	Shelton Abbey
11.2	Number of crossings required	0	1- R772	2 - M11 Motorway & R772
11.3	Potential Impact on landowners	Moderate - Construction Phase	Slight - Construction Stage	Slight - Construction Stage
12.0	12.0 Planning Policy - Sites	Ferrybank	Kilbride	Shelton Abbey
12.1	Existing Land Use on site	Derelict	Agricultural	Commercial/Landfill
12.2	Site zoning	Waterfront Zone	Action Area	Employment
12.3	Local Objectives/Constraints on site	Imperceptible - No Objectives/Constraints	Imperceptible - No Objectives/Constraints	Significant - Zone B – Flood Plain. Justification Test Required
12.5	Zoning present within 100m of site boundary	Commercial Uses	Agricultural Uses	Agricultural Uses
12.6	Zoning present within 1km of site boundary	Active Open Space/Existing Residential	Conservation Zone / Employment (E2) / Existing Residential	Amenity/Existing Residential/Conservation Zone
12.7	Other Local Objectives present within 1km of site boundary	Imperceptible - None	Slight - SEVESO II – Inside 1000m buffer. Consultation required	Slight - SEVESO II – Inside 1000m buffer. Consultation required
13.0	Engineering Design - Pipelines	Ferrybank	Kilbride	Shelton Abbey
13.1	Pipeline Length	Ferrybank	Kilbride	Shelton Abbey
	Total Length as Open Cut	510 m	2530 m	3250 m
	Total Length in Marine Outfall	900 m	0 m	0 m
	Total Length in River Outfall	0 m	340 m	125 m
	Total Pipeline Length	1410 m	2870 m	3375 m
13.2	Power Requirements	Ferrybank	Kilbride	Shelton Abbey
	Power Requirement from Load Centre to WwTP Site (18,000 pe)	22154	188262	190292
	Power Requirement from Load Centre to WwTP Site (36,000 pe)	51156	409271	423455
	Total Average Power Requirements	36655	298766.5	306873.5
13.3	Carbon Emissions	Ferrybank	Kilbride	Shelton Abbey
	Total embodied Carbon	119,975.49	244,205.43	287,175.38
	Total Lifetime Operational Carbon	780.24	6367.01	6367.01
	Total Carbon (tonnes CO <sub>2</sub> )	120755.73	250572.44	293542.39
13.4	Health and Safety	Ferrybank	Kilbride	Shelton Abbey
	Health & Safety	Moderate - Construction of long sea outfall.	Imperceptible - no significant difference	Imperceptible - no significant difference
13.5	Access / Right of Way / Wayleaves along Pipeline Corridors	Ferrybank	Kilbride	Shelton Abbey

13.6	Crossings - Waterways, Rail, etc. along Pipeline Corridors	Ferrybank	Kilbride	Shelton Abbey
	Stream Crossings	0	0	1
	Canal Crossings	0	1	1
	Motorway Crossings	0	0	1
	Regional Road Crossings	0	1	1
	Total Crossings	0	2	4
13.7	Potential to Impact on Physical Infrastructure along Pipeline Corridors	Ferrybank	Kilbride	Shelton Abbey
		More Impact on Local Roads	More Impact on Regional Roads	More Impact on Regional Roads
13.8	Potential to Impact on Strategic Utility Services along Pipeline Corridors	Ferrybank	Kilbride	Shelton Abbey
13.9	Presence of Public Utilities within Sites	Ferrybank	Kilbride	Shelton Abbey
	Public Utilities within the Site	38kV station & associated underground/submarine power cables in close proximity to site	No major public utilities within the site	No major public utilities within the site
13.10	Land Ownership and Titles along Pipeline Corridors	Ferrybank	Kilbride	Shelton Abbey
		Least Ownerships	Most Ownerships	Most Ownerships
13.11	Route Traffic Management	Ferrybank	Kilbride	Shelton Abbey
13.12	Construction Risk along Pipeline Corridors	Ferrybank	Kilbride	Shelton Abbey
13.13	Operation	Ferrybank	Kilbride	Shelton Abbey
14.0	Engineering Design - WwTP	Ferrybank	Kilbride	Shelton Abbey
14.1	Engineering Design/Treatment Processes Required - WwTP	Ferrybank	Kilbride	Shelton Abbey
		Moderate - Assumed need for further odour control	Significant - Assumed need for tertiary treatment	Profound - Assumed need for tertiary treatment & flood mitigation works
14.2	Health & Safety - WwTP Construction	Ferrybank	Kilbride	Shelton Abbey
14.3	Remediation Works -WwTP & Pipelines	Ferrybank	Kilbride	Shelton Abbey
14.4	Capital & Operational Costs	Ferrybank	Kilbride	Shelton Abbey
	Annual Energy Costs - SBR Treatment Process	€161,000.00	€319,000.00	€319,000.00
	Annual Sludge Disposal Costs - SBR Treatment Process	€364,000.00	€284,000.00	€284,000.00
	Annual Labour & Maintenance Costs - SBR Treatment Process	€289,000.00	€289,000.00	€289,000.00
	Total Annual Operational Costs	€814,000.00	€892,000.00	€892,000.00
	Capital Costs of WwTP	€7,030,000.00	€12,332,000.00	€12,332,000.00
14.5	Carbon Emissions - WwTP	Ferrybank	Kilbride	Shelton Abbey
	Annual Carbon Emissions Associated with SBR Treatment Process	824,000 kg/year	1,631,000 kg/year	1,631,000 kg/year
15.0	Land Valuation	Ferrybank	Kilbride	Shelton Abbey
15.1	Land Valuation - Sites & Wayleaves	Ferrybank	Kilbride	Shelton Abbey
	Price per area - Site	Most Expensive – 4 times more than Shelton Abbey	Lower than Ferrybank, Higher than Shelton Abbey – 2 times more expensive	Least Expensive
	Price - Wayleaves Required for Pipelines	Least Expensive (Smaller pipe lengths all laid in public roads)	Higher than Ferrybank, lower than Shelton Abbey (Longer pipe lengths)	Most Expensive (Longest pipe lengths)
	Summary	Most Expensive	Higher than Shelton Abbey, Lower than Ferrybank	Least Expensive