Inverclyde council

AGENDA ITEM NO: 7

Report To:	**Safe, Sustainable Communities Committee**	**Date:**	**8 March 2011**
Report By:	**Corporate Director Education & Communities**	**Report No:**	**SCS/54/11/AH/MM**
Contact Officer:	**Sharon Lindsay**	**Contact No:**	**714205**
Subject:	**Revised Contaminated Land Inspection Strategy**		

1.0 PURPOSE

1.1 The purpose of this report is to advise the Committee of the completion of the revised Contaminated Land Strategy by Safer & Inclusive Communities (see Appendix 1)

2.0 SUMMARY

2.1 Councils are required to publish a written strategy on the inspection of the area for contaminated land by statutory guidance made under Part IIA of the Environmental Protection Act 1990.

2.1 A Contaminated Land Inspection Strategy was first produced in August 2001 by Environmental and Consumer Services (now Safer and Inclusive Communities)

2.2 A considerable amount of progress has been made in research, technology and guidance documents since the contaminated land regime came into force in 2000. As a result, the 2001 Inspection Strategy required to be updated.

2.3 The new strategy goes into far greater detail than the previous one as it is intended to give a fuller picture both of how the Council deals with contaminated land from an inspection and enforcement perspective and to give a better picture of issues and historical processes likely to result in contaminated land issues in Inverclyde.

3.0 RECOMMENDATIONS

It is recommended that the Committee approves the revised Contaminated Land Strategy.

Albert Henderson
Corporate Director Education & Communities

4.0 BACKGROUND INFORMATION

4.1 Part IIA of the Environmental Protection Act 1990 provides the legislative framework for the identification and remediation of contaminated land, introducing for the first time a statutory definition of contaminated land. It is aimed at addressing land which has been historically contaminated and which poses unacceptable risks to human health or the wider environment in the context of the current land use.

4.2 The provisions of Part IIA came into force in Scotland on 14th July 2000 as a result of which the Council has a statutory responsibility to inspect land within its area for contamination.

4.3 There are currently 15 contaminated land sites in Scotland. Inverclyde has no determined sites although contamination is known to exist due to the historical industrial legacy.

4.4 A large amount of this potentially contaminated land is currently remediated through the Planning process, for example the old shipbuilding yards and docks. The remainder is either yet to be investigated or the extent of contamination found has been found to be insignificant.

4.5 The Council is required to prepare a written inspection strategy detailing its approach to this inspection process. Statutory Guidance issued in July 2000 gives advice to local authorities on the format, layout and content of inspection strategies.

4.6 The guidance requires that the strategy is reviewed by neighbouring local authorities, Scottish Environment Protection Agency, Scottish Natural Heritage, Food Standards Agency, Historic Scotland and Scottish Government. This will be carried out following Committee approval.

5.0 IMPLICATIONS

5.1 Finance

none

5.2 Personnel

none

5.3 Legal

none

Inverclyde council

Revised Strategy for Management of Land Contamination

2011

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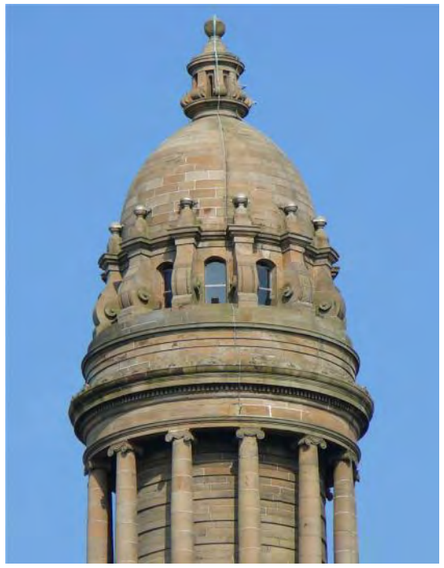
ANNEX

Executive Summary



2010 marks a significant milestone in the contaminated land regime, which was brought into force in April 2000 by the provisions of Part IIA of the Environmental Protection Act 1990. This Act places a statutory duty on each Local Authority to "*cause its areas to be inspected from time to time for the purpose of identifying contaminated land*".

The original inspection strategy for Inverclyde Council was published in 2001 and set out a starting point from where potentially contaminated land would be identified, prioritised and inspected.

In the course of carrying out the inspections Inverclyde council has accumulated an extensive amount of information on the quality of land its area. This information is recorded in a database as Land Quality Records.

In the event that significant contamination is identified that requires the Local Authority to bring about its remediation the site may be determined to be Contaminated Land. Information of all such sites would be available for public view and published on Inverclyde Councils website.

Presently, there are a total of 15 Contaminated Land sites across Scotland. Inverclyde currently has no Contaminated Land determined within its area. However, given the heavy industrial legacy in the area contamination *is* known to exist. The reason that this land has not been determined is because either the extent of contamination has not been demonstrated to be significant or that the site is in the process of being redeveloped and therefore falls under the control of Development Management.

An important aspect of the contaminated land regime is the requirement for land contamination to be considered in the process of Development Management and the Planning Authority is statutorily obliged to conduct the appropriate consultations in this regard. This typically induces a very stringent approach to contaminated land remediation where the onus is not to prove that harm could be caused but to ensure that it is not introduced by the new development.

A significant proportion of potentially contaminated land in Inverclyde has been remediated through the Development Management process (i.e. through Planning and Building Standards). Such notable sites include the old shipbuilding yards and docks, which are in the process of significant regeneration.

The purpose of this document is to update and revise the 2001 strategy in the context of existing Inverclyde Council and Scottish Government policy and with a greater awareness of the implications of the regime.

1 Introduction

This strategy has been prepared by Inverclyde Councils' Contaminated Land Officer in accordance with the requirements of Part IIA of the Environmental Protection Act 1990 which places a statutory duty on all Local Authorities to prepare a written strategy document detailing the approach for the inspection of its area for contaminated land. It updates and replaces the original strategy published in 2001.

In the ten years since the contaminated land original strategy was published the procedures for managing land contamination sites has evolved. It is recognised that issues of land contamination are more efficiently and effectively addressed when considered as part of a wider improvement schemes.

1.1. Inverclyde Council Strategic Aims

Inverclyde Councils strategic focus is on addressing the major challenges facing the area. These have been identified as;

- De-population and changing demography
- Coping with de-industrialisation to more service based industries
- Employment
- Health and health inequalities
- The natural, built and physical environment

Strategies have been developed by Inverclyde to focus services and resources in tackling these issues. Emphasis is on partnership working with multi-disciplinary services, internally within Inverclyde Council and externally with the wider community.

Inverclyde Council strategic aims are set out in the Community Plan (2008-2018) and the Single Outcome Agreement 2009-2011. National and local strategic outcome agreements are discussed and listed in Annex A.

The Vision

"To create a confident, inclusive Inverclyde with safe, sustainable, healthy, caring communities, and a thriving, prosperous economy, where everyone is encouraged to achieve their potential and can make a positive contribution to the area."

Inverclyde Community Plan 2008 – 2018, "*Inspiring Inverclyde*"

Inverclyde's service work plan identifies NO12 (National Outcome) and SOA8 (Strategic Outcome Agreement) as being the key outcomes that would correspond to the functions contaminated land management;

NO12 **We value and enjoy our built and natural environment and enhance it for future generations**

SOA8 **Inverclyde is a place where people want to live now whilst at the same time safeguarding the environment for future generations**

However, in addressing contaminated land issues, additional benefits may be realised, which may contribute towards achieving other outcomes, particularly those referring to health and regeneration aspirations.

1.2. Why have a Land Contamination Management Strategy?

Land which is contaminated hinders the pursuit of sustainable development by:

- Impeding social progress, depriving people of a clean and healthy environment;
- Threatening wider damage to human health, the water environment, ecology and property;
- Inhibits productive use of land and soil resources;
- Increases development pressures on greenfield areas;
- Places a high burden on individual companies, homeowners, other landowners and the economy as a whole, in meeting remediation costs.

The strategy for managing land contamination within Inverclyde is therefore integral to achieving Inverclyde strategic outcomes and meeting its statutory obligations in bringing about the remediation of determined Contaminated Land

With the implementation of this strategy Inverclyde Council seeks to minimise impediment to the regeneration of brownfield land and encourage a proactive approach to enhancing land value by addressing contamination liabilities. Where this approach fails the regulatory powers of Part IIa of the Environmental Protection Act 1990 shall be applied to bring about the enforced remediation of contaminated land. This council shall endeavour to identify appropriate persons responsible for bearing the cost of this work.

Where appropriate persons cannot be sourced the local authority shall work in partnership to find the most practical and effective means of removing risk to human health and the wider environment.

1.2.1. Strategy Consultations

In the preparation of this document consultation has been sought internally from other Local Authority Services and externally from other Scottish Local Authority Contaminated Land sections, Scottish Environment Protection Agency, Scottish Natural Heritage and Food Standards Agency.

During the consultation process a beta version of this report will be available from Inverclyde Councils website and updated when the consultation period is complete.

2 Regulatory Context

2.1. The Contaminated Land Regime

Scottish Government policy acknowledges that land contamination hinders the pursuit for sustainable development. Its objectives with respect to land contamination are to:

1. To identify and remove unacceptable risks to human health and the environment;
2. To seek to bring damaged land back into beneficial use;
3. To seek to ensure that the cost burdens faced by individuals, companies and society as a whole are proportionate, manageable and economically sustainable.

These three objectives underlie the "**suitable for use**" approach to the remediation of contaminated land and focuses on the associated risks. The risk presented by any level of contamination will vary greatly according to environmental setting, historic and current land uses etc. Assessment of risk therefore needs to be specific for each site.

The "**suitable for use**" approach comprises the following three elements;

- Land is made suitable for its ***current*** use by identifying and removing unacceptable risks to human health and the environment;
- Land is made suitable for any ***new*** use by assessing the potential risks from contamination before planning permission is given for the development and, where necessary, remediating the land before the new use commences to avoid unacceptable risks to human health and the environment;
- Requirements for remediation are limited to the work necessary to prevent unacceptable risks to human health or the environment from the current use or future use of the land for which planning permission is being sought.

The exception to the "**suitable for use**" approach to regulatory action applies where contamination has resulted from a specific breach of an environmental licence or permit. In such cases the polluter will be required under the relevant regulatory regime to remove the contamination completely.

2.2. Part IIA

Part IIA of the Environmental Protection Act 1990 came into force in 2000. It places statutory duties on local authorities with regard to addressing the issue of historically contaminated land in their areas. Implementation of aspects of the new regime is covered by the Contaminated Land (Scotland) Regulations 2000, the Contaminated Land (Scotland) Regulations 2005 and the Radioactive Contaminated Land (Scotland) Regulations 2007 (and amendments). Comprehensive statutory guidance on implementation is provided by Scottish Executive paper SE/2006/44.

Contaminated land is defined as;

"any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that –

(a) significant harm is being caused or there is a significant possibility of such harm being caused, or;

(b) significant pollution of the water environment is being caused or there is a significant possibility of such pollution being caused."

Once Contaminated Land has been determined there are four stages to dealing with the area:

1. Establishing who is the “appropriate person” to bear responsibility for the remediation (or clean-up) of the land.

2. Deciding what remediation is required and to ensure that this occurs, either through reaching a voluntary agreement or alternatively if this cannot be achieved by serving an official remediation notice. In certain circumstances by carrying out remediation work themselves.

3. Determining who should bear what proportion of the liability for meeting the costs of the work.

4. Recording certain information about regulatory action on a public register.

2.3. Development Management

The planning system and building standards provide the dominant regulatory powers for managing land contamination and addressing the restoration of land impacted by historical contamination.

The possibility of contamination on a site proposed for development should trigger a response which takes into account the potential risk. Planning authorities, therefore, need to consider 'contaminated land' in its broadest sense.

2.3.1. Planning

Panning Advice Note (PAN) 33 states that “where development is to take place on potentially contaminated land, a key element of the 'suitable for use' approach is to ensure that land is made suitable for the proposed new use”. This is the responsibility of the planning authority and a planning officer will need to consider, with specialist advice if necessary, whether the developer has adequately identified the sources of contamination and implemented a remediation scheme suitable for the proposed use that will ensure that all the receptors are adequately protected from contamination.

Planning authorities therefore require that applications include suitable remediation measures. If they do not, then there are grounds for refusal. Where applications are approved, conditions should be put in place to ensure that land is remediated before the commencement of any new use. Typical contaminated land conditions are listed in Annex B.

If the information provided by the applicant is insufficient to enable the authority to determine the application, the applicant may need to be asked to provide further information by means of a direction under Article 13 of the Town & Country Planning (General Development Procedure) (Scotland) Order 1992.

2.3.2. Building Standards

The Building (Scotland) Regulations 2004 require that every building must be designed and constructed in such a way that there will not be a danger to the building nor a threat to the health of people in and around the building due to the presence of harmful or dangerous substances.

The intention is to ensure that measures are taken to protect people and the fabric of a building, from harm which could be caused by site conditions. Essentially the site beneath a building and ground immediately adjoining that site must have harmful or dangerous substances removed or made safe. Thorough investigation is necessary to ensure that appropriate measures can be taken where there is evidence of such substances.

2.4. Other Land Management Regulations

2.4.1. Water Framework Directive

The Scotland river basin management plan (RBMP, 2009) was produced as one of the requirements of the European Union's Water Framework Directive. This plan improves the protection of the Water Environment and addresses significant impacts by coordinating all aspects of water management.

The Groundwater Daughter Directive (GWDD) does not permit entry of pollutants to protected groundwater resources.

2.4.2. Environmental Impact Assessment

The Environmental Impact Assessment (Scotland) Regulations 1999 require that certain projects (projects in Schedule 1 of the regulations and projects in Schedule 2 which are likely to have significant environmental effects) must be the subject of Environmental Impact Assessment (EIA) prior to development consent. The presence of contamination in itself is not sufficient to trigger the requirement for EIA, although it could be a factor in establishing if a development is likely to have significant environmental effects.

2.4.3. Statutory Nuisance

Until the implementation of the Part IIA contaminated land regime, the statutory nuisance system under Part III of the 1990 Act was the main regulatory mechanism for enforcing the remediation of contaminated land.

With the contaminated land regime, most land contamination issues are therefore removed from the scope of the Statutory Nuisance regime. Any matter which would otherwise have been a statutory nuisance will no longer be treated as such, to the extent that it consists of, or is caused by, land "being in a contaminated state". The definition of land which is "in a contaminated state", and where the statutory nuisance regime is therefore excluded, covers all land where there are substances in, on, or under the land which are causing harm or where there is a possibility of harm being caused.

However, the statutory nuisance regime will continue to apply to the effects of deposits of substances on land which give rise to such offence to human senses (such as stenches) as to constitute a nuisance, since the exclusion of the statutory nuisance regime applies only to ‘harm’ and the pollution of the water environment.

2.4.4. Waste Management

Soil becomes controlled waste if the holder of it discards it, or intends to or is required to discard it. Soil may be discarded because it presents a risk to the environment or current or new users of the land as a result of contamination, or because it is surplus to requirements. It is essential that the appropriate route for dealing with the waste soil is selected.

Part IIA does not apply in situations where the Waste Management Licensing System can be enforced.

2.5. Regulatory Roles

Due to the complex characteristics of some sites, contaminated land issues can often require a multi-agency response. Further details of key organisations and stakeholders are provided in Section 7.

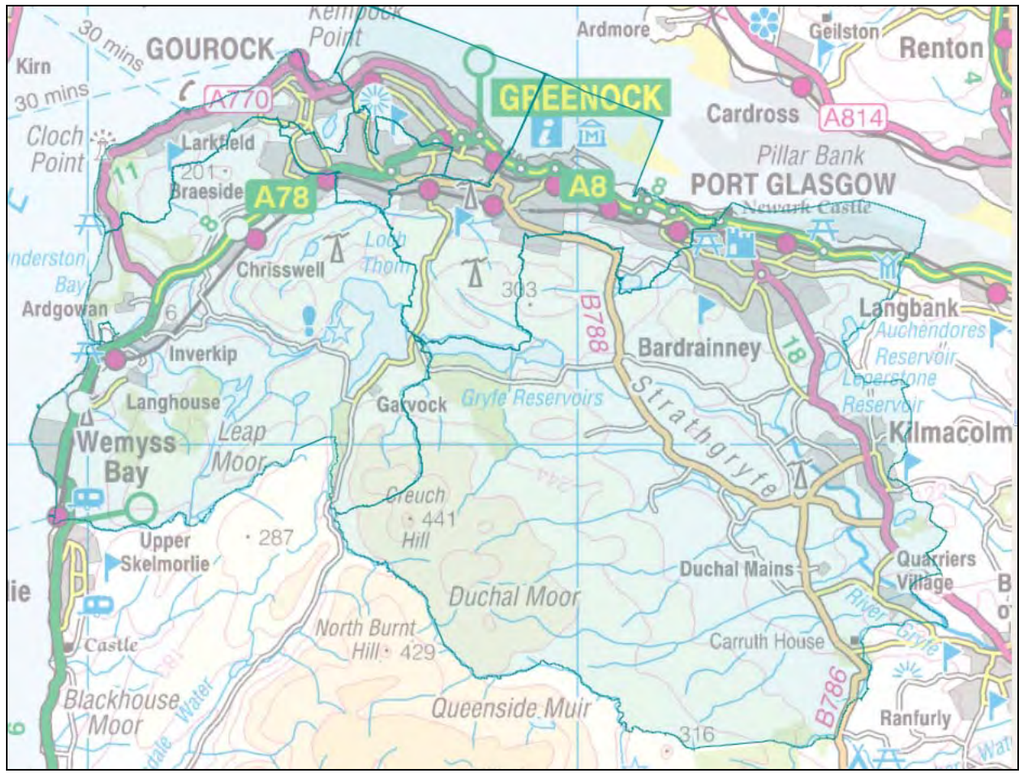
Regulatory Roles

Lead Regulator	Relevant Legislation	Regulatory Role
Local Authority	Town and Country Planning (Scotland) Act	Provides consent for development and some voluntary remediation activities
	Building Standards (Scotland) Regulations	To protect buildings and human health from harmful or dangerous substances
	The Food Safety Scotland Act 1998 Food Safety Act 1990 The Food and Environment Protection Act 1985	To prohibit specified agricultural activities in a designated area in order to protect consumers from exposure to contaminated food. Part IIA enforcing authorities should liaise with the Food Standards Agency about any possible use of the powers in Part I of the 1985 Act.
	Private Water Supplies Regulations 2006	Enforce and advise on measures for meeting water quality standards for both domestic and commercial supply.
	The Environmental Protection Act 1990 The Environment Act 1995 The Control of Pollution Act 1974 The Contaminated Land (Scotland) Regulations 2000 The Contaminated Land (Scotland) Regulations 2005	Prepare and update a contaminated land inspection strategy for its area. Responsible for the investigation, identification, characterisation and regulation of remediation of contaminated land (except for Special Sites). To establish and maintain a public register of determined Contaminated Land sites.
Scottish Environmental Protection Agency (SEPA)		Advisor to the Local Authority. Duty to cause to be remediated, land designated as a special site. Author and publisher of periodic reports on contaminated land in Scotland. To establish and maintain a public register of Special Sites.
	Water Framework Directive and Groundwater Daughter Directive	
	Waste Management & Licensing	Duty to protect the environment and human health from the effects of waste management and disposal.
	The Radioactive Contaminated Land (Scotland) Regulations 2007	Responsible for the investigation, identification, characterisation and regulation of remediation of radioactive contaminated land (RCL).
	Controlled Activities Regulations (Regulations) 2005	To ensure proportionate controls over activities.
Scottish Natural Heritage (SNH)	Natural Heritage (Scotland) Act 1991 Wildlife & Countryside Act 1981 Land Reform (Scotland) Act 2003 Nature Conservation (Scotland) Act 2004	Secure the conservation and enhancement of Scotland's natural heritage. Notifying Sites of Special Scientific Interest. Responsible for supporting various other national ecological designations.
Health Protection Scotland (HPS)	Established in 2005 by the Scottish Government	A division of NHS National Services Scotland, which provides advice, support and information to health professionals, national and local government, the general public and a number of other bodies to protect human health.
Food Standards Agency (FSA)	Since 1 April 2000, responsibility for food safety has been taken over by the Food Standards Agency.	Crops and livestock animals are included as receptors within the scope of the Part IIA regime for dealing with contaminated land. The FSA should be consulted separately on all matters relating to food safety and the interpretation and enforcement of relevant legislation (CLAN 4/04).
Health and Safety Executive (HSE)	The Health and Safety at Work etc Act 1974 The Construction (Design and Management) Regulations	Controls are concerned with risks to the public or employees at business and other premises. Liaison with HSE will help to ensure that unnecessary duplication of controls is avoided.

3 A Profile of Inverclyde

Inverclyde is one of 32 councils in Scotland and is located in West Central Scotland. It is situated on the south bank of the Clyde Estuary at the mouth of the River Clyde where it opens into the Firth of Clyde. The neighbouring authorities are North Ayrshire to the south, Renfrewshire to the east with Argyll and Bute to the west and north. Inverclyde covers an area of 61 square miles (158 square km) with a coastline that extends to 23 miles (37 kilometres).

Inverclyde Area



The main towns of Greenock, Port Glasgow and Gourock sit on the Firth of the Clyde. Smaller towns include the small coastal settlements of Inverkip and Wemyss Bay which lie to the South West of the area and the villages of Kilmacolm and Quarriers Village which are located inland in semi-rural countryside.

3.1. History

The areas industrial legacy is the predominant source of contamination present within the ground. A review of historical activities is necessary in determining the likelihood of contamination being present and it is the first stage of every contaminated land assessment.

Greenock was founded as a fishing village sometime prior 1592. After the Act of Union 1707, Greenock's facilities made it the main port on the West Coast and it prospered due to trade with the Americas, importing sugar from the Caribbean. Originally known as Newark, following the purchase of Newark Bay as a harbour by the City of Glasgow in 1668, Port Glasgow was created as a parish in 1695 and the town was made a burgh of barony in 1775. Large ships which could not go up the (then) shallow Clyde stopped here, trading cargoes of cotton, hemp, iron, timber and tobacco. As the Clyde was deepened the port focused on shipbuilding.

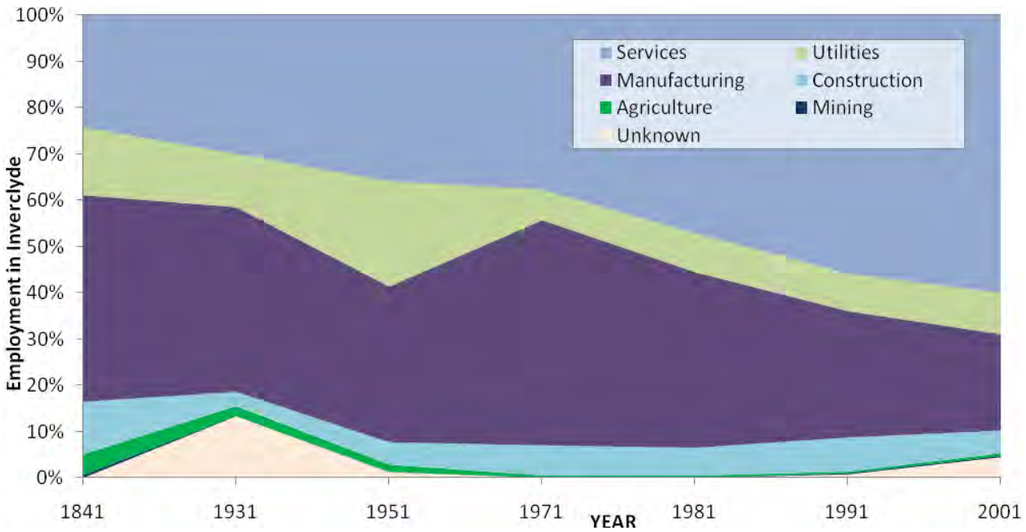
In the 18th and 19th century shipbuilding, ropeworks and quarrying were the dominant industries within the Inverclyde region. Port Glasgow's shipyards accounted for a quarter of the total tonnage of ships launched on the Clyde.

Once the export capital of Scotland, numerous manufacturing companies such as sugar mills and breweries became established in Greenock and Port Glasgow. In the mid 1800's there were about a dozen sugar houses in operation. Tate and Lyle was the last to close down in the late 1990's.

All of these industries, along with the hard working residents of Inverclyde, produced significant quantities of waste. The majority of which was conveniently landfilled within the nearby quarries.

During the Second World War, the strategic location of the Inverclyde coast for British and US Naval operations supported by land based services including the Clyde Torpedo factory and a squadron base for maintenance of the RAF seaplanes.

Employment in Inverclyde 1841-2001



Source: General Register Office for Scotland. Census of Population. 1841 – 2001.

Activated charcoal has been manufactured in Greenock for over 150 years. The present plant in Dellingburn Street is only one of two such plants still operating in the world.

More recently tourism, electronics, light and service industries have dominated the industrial scene of Inverclyde.

3.2. Environmental Setting

The environmental setting establishes a basic conceptual model and identifies the physical pathways by which contaminants may mobilise. In the case of the water environment (hydrology and hydrogeology) it is both pathway and a potential receptor to the harmful effects of significant contamination.

3.2.1. Geology

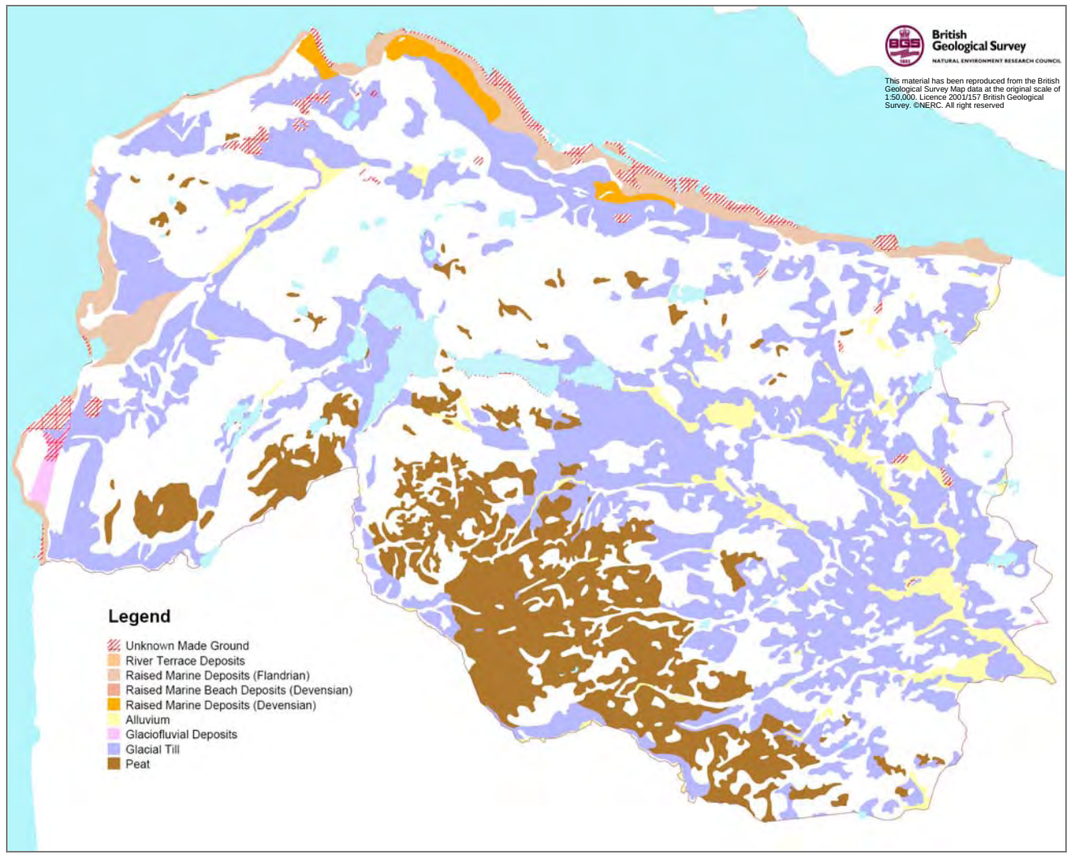
The coastal areas of Inverclyde are dominated by raised beach deposits along the southern bank of the Clyde estuary down to Wemyss Bay. A 4 km wide gap in these deposits occurs at Gourock where bedrock is at or near surface. In general the deposits extend approximately 1 km inland, although they are also present up to 2 km east of Ardgowan Point.

The distribution of inland superficial deposits is patchy and thin. The southern boundary of the Council area is dominated by peat which covers the high ground (west to east) on Blood Moss, Leap Moor to the widest expanse of peat on Duchal Moor.

To the north of the peat deposits and within the coastal rim, the west of Inverclyde is dominated by areas of little or no drift deposits. Isolated patches of boulder clay appear on the west side of Loch Thom, surrounding Coves Reservoir south of Gourock Bay, and east of the sand and gravel deposits at Inverkip.

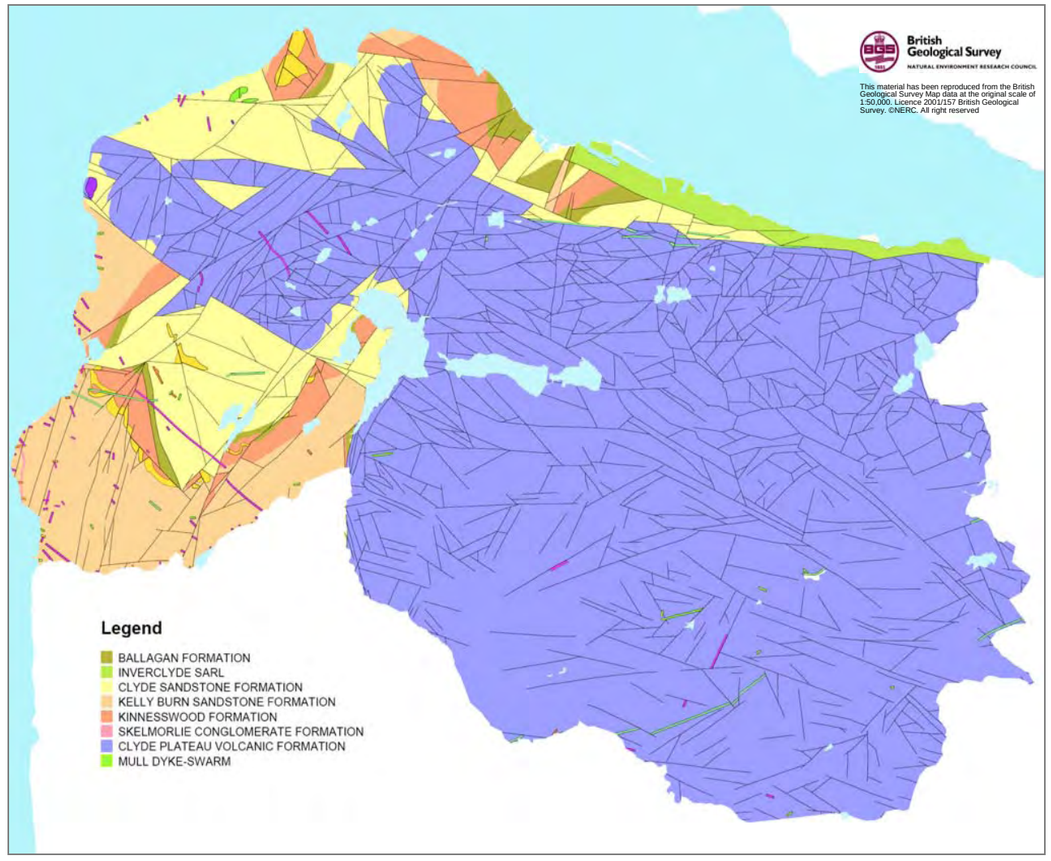
The east of Inverclyde shows more extensive layers of boulder clay but still has significant areas where bedrock is at or near surface.

The bedrock of Inverclyde is dominated by the extrusive igneous rocks or lavas of the Clyde Plateau Volcanic formation. Basaltic rocks extend from the eastern boundary of Inverclyde as far west as Loch Thom. Younger, sedimentary rocks surround this basalt plateau on both the northern and western coast of Inverclyde, from Port Glasgow to Gourock and south of Gourock to Wemyss Bay respectively. These two blocks of sedimentary rocks are separated by a small lens of basalt which continues through to the coast at Cloch Point.



Superficial Deposits across Inverclyde.

The block of sedimentary rocks from Port Glasgow to Gourock is from the Carboniferous Calciferous Limestone Series which contain some coal seams. Strata from the Devonian Upper Old Red Sandstone Series dominate the sedimentary rocks from Cloch Point to Wemyss Bay.



Bedrock Geology and Faulting across Inverclyde.

3.2.2. Water Environment

The river basin management plans (RBMP) for Scotland was approved, adopted and published on the 22nd December 2009. The plans have been produced as one of the requirements of the European Union's Water Framework Directive and similar plans are being put in place across Europe. The condition of waters will be reviewed annually and progress will be reported in detail when the plan is updated in 2015, 2021 and 2027. The overall aim is for 98% of all Scotland's waters to be in a good condition by 2027.

Surface Water Bodies

The Clyde estuary bounds Inverclyde to the north and west. To the north the waters are classified as transitional of moderate quality with a target objective to improve quality status to good by 2015 (RBMP, 2009). Five status classes are applied to surface water: high (maximum) good, moderate, poor and bad.

From Cloch Point the Clyde is classified as coastal, with the quality status indicated to be good. Lunderston Bay is the only coastal stretch within Inverclyde classified as protected bathing waters.

There are also a number of rivers and numerous smaller watercourses with drainage radiating from the central upland areas of Inverclyde. These are formed within the Inverclyde Coastal and River Gryfe catchment areas and are generally unclassified.

Gryfe Water and Kip Water are both indicated to be heavily modified and are protected drinking water sources. Ecological potential is a measure of the extent to which the water bodies' ecological quality has been maximised, given the limits imposed by the physical modifications necessary for the bodies' uses. The Gryfe is a well known salmon river in the area and is considered to have good ecological potential. However, the Kip Water is classified as having a bad ecological potential. With the implementation of the river basin management plan, strategic intervention will be necessary if the quality status of all classified watercourses within Inverclyde are to be improved to achieve the target of good (or better) status by 2015.

The small urban watercourses within Inverclyde are unclassified. However, these watercourses such as Gourock Burn, Daff Burn and Mile Burn *etc* are known to be affected by storm water overflows from sewers and other point and diffuse pollution sources associated with anthropogenic activities in the area.

Loch Thom and Gryfe reservoirs were created in the 19th Century to power and supply water to the growing industries. These are protected drinking water sources classified as heavily modified (with the dam structures Scheduled Ancient Monuments). The ecological potential in these reservoirs are moderate with a target objective to improve quality status to good by 2027 (RBMP, 2009).

Groundwater Bodies

The underlying hydrogeology within Inverclyde is indicated to form part of the lower Clyde basin catchment area.

The Upper Old Red Sandstone Series of western Inverclyde is highly permeable. These formations are usually with a known or probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public supply and other purposes.

The Carboniferous strata of Inverclyde are moderately permeable. These are fractured or potentially fractured rocks that do not have a high permeability. However, although these formations will seldom produce large quantities of water for abstraction, they are important for local supplies and in supplying base flow to rivers.

The igneous rocks which underlie much of eastern and central Inverclyde are classified as weakly permeable and are formations of generally low permeability that do not widely contain groundwater in exploitable quantities. However, some formations can locally yield water supplies in sufficient quantities for private/domestic use.

The permeability of superficial deposits within the region is typically high around the coastal areas with moderate aquifer productivity and low permeability in the upland areas. In consideration of contaminants at the surface and the vertical migration to the uppermost aquifer the groundwater vulnerability is considered to be high across the majority of Inverclyde.

All bedrock groundwater in Inverclyde is considered a protected drinking water resource. Only two classes are used to describe the status of groundwater: good and poor and both the quantitative class and groundwater chemical class are indicated. The quantitative class is formulated from an assessment of whether there is sufficient water to maintain the health of the ecosystems it supplies. The chemical class is determined by assessing the chemical quality against appropriate criteria. The 2010 quality classification indicated Inverclyde's groundwater bodies to be 'Good, Good' status.

3.2.3. Meteorology and Climatology

Meteorological Office data derived from Abbotsinch (Glasgow Airport) for the thirty-year period 1961-1990 gives an average annual rainfall of 1024mm and an average of 1300 annual sunshine hours. The mean annual wind speed is 8.8 Knots being predominately from the southwest in winter moving to westerly in the summer months.

Climatically the west coast of Scotland is mainly cool summers but with relatively mild winters. Inverclyde is typical of this temperate maritime climate, which is heavily influenced by the Atlantic Gulf Stream.

Climate changes in west Scotland anticipate warmer temperatures and increased precipitation, which may cause increased erosion and flooding in the area.

3.3. Environmental Protection

Inverclyde contains many natural and manmade features which constitute a considerable asset to the area. These are considered to be potential receptors which required protection from the harmful effects of significant land contamination.

3.3.1. Ecological Protection

Inverclyde contains a network of sites of importance for nature conservation including;

- 98 Ancient Woodland sites;
- 31 Sites of Importance for Nature Conservation (SINCs);
- 10 Sites of Special Scientific Interest (SSSI);
- 4 candidate Ramsar sites; and
- 2 Special Protection Areas (SPA)

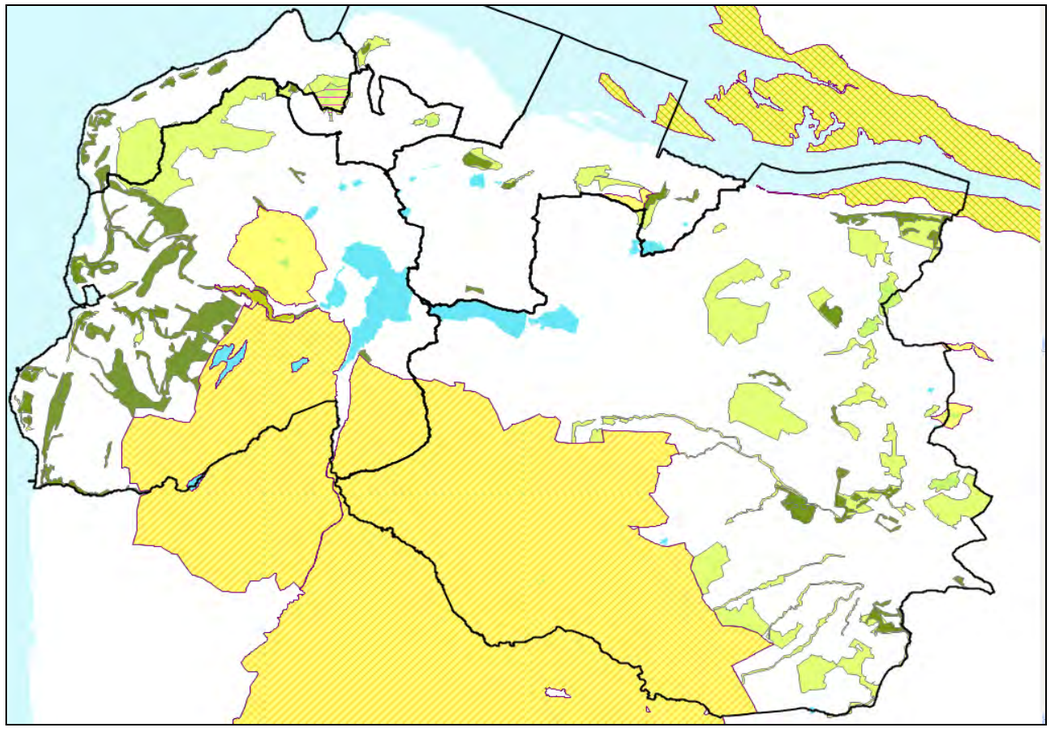
Ancient Woodland sites in Scotland are woodland areas known to be in existence prior to 1750 and as forestry plantations were not common prior to this time these areas are considered likely to be derived from natural origins.

Sites of Special Scientific Interest are national conservation areas considered to be of special interest and by virtue of its fauna, flora, geological or physiographical / geomorphological features.

Ramsar sites are wetlands of international importance, designated under the Ramsar Convention 1971. Ramsar sites may also incorporate riparian (banks of a stream, river, pond or watercourse), coastal zones adjacent to the wetlands and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands.

The Clyde Muirshiel Regional Park and the Lower Clyde River Valley Project both address the resources of nature conservation. The Renfrewshire Heights are a Special Protected Area that is also recognised as being of regional environmental importance.

Natura 2000 is a network of protected bird and habitat areas in the European Union. Two Special Protected Areas (SPAs) for birds are indicated, to the north at 'Inner Clyde' and in the southern upland areas of Inverclyde.



Distribution of Protected Ecological Sites across Inverclyde.

The Renfrewshire, Inverclyde, and East Renfrewshire Local Biodiversity Action Plan (LBAP), is a partnership initiative between these local authorities and a range of conservation organisations. It focuses on both urban habitats and the importance of rivers within the area, and includes a range of actions for identified habitats and species which will increase local biodiversity. These are recognised by the local authority as Sites of Importance for Nature Conservation (SINCs). These SINCs are non-statutory local wildlife protection areas designated by the local authority for protection against development.

3.3.2. Built Heritage

As well as its rich natural environment Inverclyde has a considerable historic heritage in the built environment with;

- 242 listed buildings;
- 3 historic gardens & designed landscapes.
- 10 industrial archaeological sites;
- 7 ancient monuments; and
- 5 designated Conservation Areas, three of which are classed as “outstanding”;

Shaws Water Aqueduct (Greenock Cut) was open in 1827 to provide a water and power supply to the industries and population of Greenock. The aqueduct collects water from constructed reservoirs in the hills. The structures associated with the reservoirs and aqueduct was given protection as a Scheduled Ancient Monument in 1972.

Greenock’s *West End* and parts of Kilmacolm both are recognised conservation areas. Popular with the 19th century wealthy merchants of the region, the area is characterised by wide, tree lines streets in blocks with substantial residential properties of the Georgian and Victorian period.

3.4. Demography

The area of Inverclyde has been subject to a process of significant de-industrialisation which has shifted economic activity from the traditional industries of shipbuilding and heavy engineering towards the public and service sectors. This de-industrialisation has also resulted in significant and depopulation of Inverclyde.

Demographic trends now show that Inverclyde has one of the fastest declining population bases in Scotland. Between 1981 and 2001 the population of Inverclyde fell by 18% and this trend is forecast to continue with a further 14% decline in population by 2024. This decline in young and working age population, corresponding with an increasingly aging population will put pressure on Inverclyde's resources.

The de-industrialisation has left areas of land that have been vacated and left in a derelict condition. In 2009, Inverclyde had 121 sites on the Scottish Vacant and Derelict Land Survey (SVDLS) register covering an area of 122.12 hectares and situated within populated urban locality.

As part of the necessary regeneration this land must be brought back into productive use and it will be necessary to ensure that residual contamination is made safe to protect human health and the wider environment. With the pressure on council resources it will be necessary to ensure that our objectives to remediate land contamination are carried out efficiently. This will require close or joint partnerships with land owners, tenants, developers and other council services.

3.5. Health

Inverclyde has lower life expectancy and mortality 16% higher than the national average. Inverclyde is ranked as thirtieth among the 32 Scottish local authorities for life expectancy at birth and has the third lowest life expectancy for both men and women. Alcohol and substance misuse are particular problems. Other national problems affecting Inverclyde are obesity and child health.

The physical environment is recognised as being key to promoting good health and wellbeing. The relationship between environment and health is a complex interaction of factors in the social and physical environment with behaviour and genetic makeup.

In practice, land contamination affects affluent communities as much as poorer neighbourhoods but perception of contamination risks in the environment near the home can result in a negative health response. It is crucial that intervention measures are proportional to the actual risks. By adopting a strategic approach to interventions in partnership with other services, wider sustainability objectives can also be met.

3.6. Wealth

Inverclyde has a high proportion of deprived areas, 42% of the Inverclyde population live in areas which are defined as the most deprived 20% across Scotland. Household incomes are lower than the national average and the area has above the average levels of benefit dependency. There are three key clusters of deprivation in the area. South West Greenock, Greenock East/Central and Port Glasgow are among the most deprived 15% of wards in Scotland (source: SIMD 2006 General Report, Scottish Executive National Statistics).

Whilst the council endeavours to make the polluter pay, costs for the remediation of contaminated land will fall to the existing appropriate person. This may be the current landowner who may have inadvertently purchased the land in its contaminated condition. In some cases of orphaned linkages or sites where the appropriate person would suffer financial hardship, local authorities may waiver or reduce the remediation costs.

3.7. Redevelopment

Inverclyde is going through a period of considerable regeneration. **Safer and Inclusive Communities** have been actively involved in advising other services of contaminated land related issues. Particular sites we have provided assistance include the refurbishment and building of new schools, the extensive upgrading and renewal of

housing stock by local housing associations, the upgrading of road and rail infrastructure and the regeneration of the derelict ship yards along the Port Glasgow and Greenock Waterfront areas.

The process of identifying and remediating land contamination will help significantly to improve and protect the natural, built and physical environment within Inverclyde. Inverclyde Council has adopted a proactive role in ensuring that land is made safe through development management and regeneration.

3.7.1. Urban Regeneration

Riverside Inverclyde Urban Regeneration Company (**ri**) is a joint initiative between Scottish Enterprise, Inverclyde Council, the Scottish Government, Clydeport and the wider private and voluntary sectors.

Its objective is the regeneration of the 5 mile strip of waterfront area between Port Glasgow and Greenock. Along the waterfront the old industrial sites are being cleared for new residential housing, leisure and commercial developments.

In 2007, **River Clyde Homes Housing Association** took ownership of all council housing stock with a commitment to construct over 1,000 new homes and renovate over 5,000 houses to meet the requirements of the Scottish Housing Quality Standard by 2015. All other housing associations within Inverclyde will also be required to meet the same standards by 2015.

3.7.2. Schools Estate Renewal Programme

The school estate renewal programme will provide significant up grade to the learning environment. The development of community schools will mean that the wider population can also benefit from a modern school estate.

Since 2004, the Council has closed six Primary Schools and one secondary school, significantly reducing surplus capacity, refurbished six schools and partially refurbished or made improvements to a further six. Additionally two new nurseries have been provided.

The Prudential schools project provides a new secondary, Inverclyde Academy, and a new primary school, Newark Primary School. This project will replace two secondary schools with one new school and three primary schools with one new school.

The public private partnership (PPP) project will provide two new secondary schools and a further two primary schools. This will replace three existing secondary schools with two new schools and four existing primary schools with two new schools.

The management of land contamination was one of the many considerations at each of the school sites. Early involvement allowed us to employ our expertise and information systems to establishing the likelihood of pollutant linkages being present at the sites. This support to the project team provided invaluable information concerning possible cost implications and identified where further independent investigations would be necessary.

Consultations with the schools estates team has been continuous throughout the renewal programme, providing input to the scoping of the preliminary investigations and review of assessments and remediation design proposals submitted by contractors for each educational establishment.

3.7.3. Transport

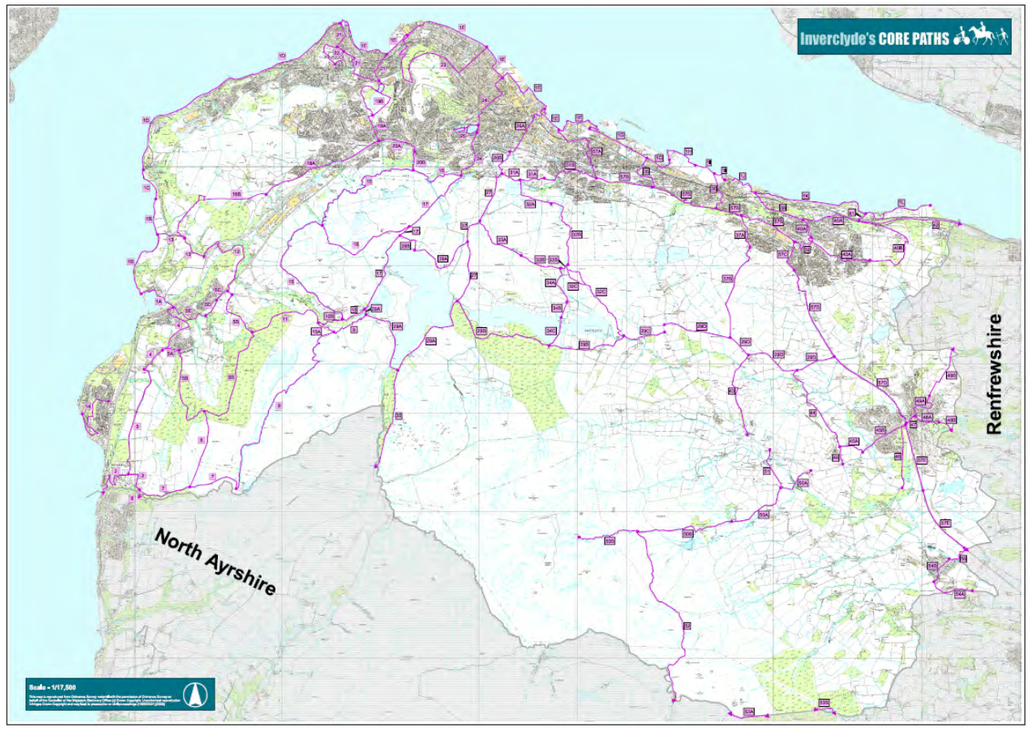
Inverclyde Council in conjunction with key stakeholders including Transport Scotland, SPT, Caledonian MacBrayne and Network Rail, are refurbishing the existing station to provide a welcome and modern environment for passengers and staff, and a facility which will provide future opportunities to link this project to the wider redevelopment of Gourock Waterfront. Land contamination at these sites would be robustly dealt with through the development management process.

3.7.4. Biodiversity and Access

Green Hairstreak Butterfly

Climate change is also a consideration for the area, and partners are working to identify ways in which they can all contribute to the reduction of Inverclyde's carbon and ecological footprints.

Initiatives like the **Integrated Habitat Network Modelling Project** should help the local authority to protect, enhance or create key areas of woodland, wetland and grassland, working to link up habitats, ensuring sustained biodiversity across the area.



Inverclyde adopted Core Paths Plan

The **Core Paths Plan and Paths for All** will also contribute to reducing carbon footprints, promoting more sustainable forms of transport and getting people exercising through walking or cycling with the knock on benefits to health that this creates.

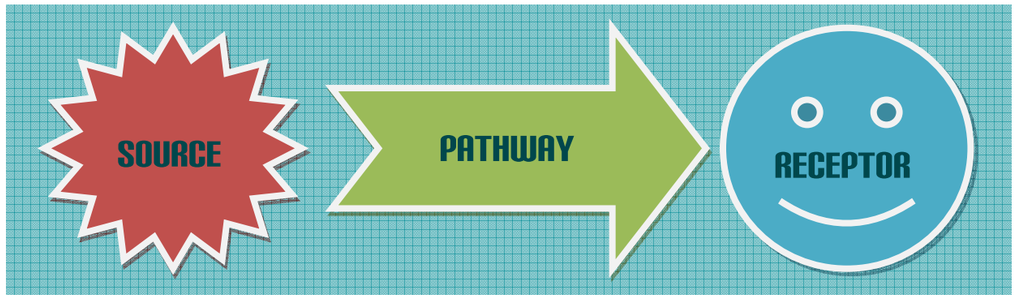
Consideration of environmental quality and assessment of risks with the changes in behavioural activities in these areas are also subject to consideration within the land contamination management strategy.

4 “Suitable for Use” – A Risk Based Approach

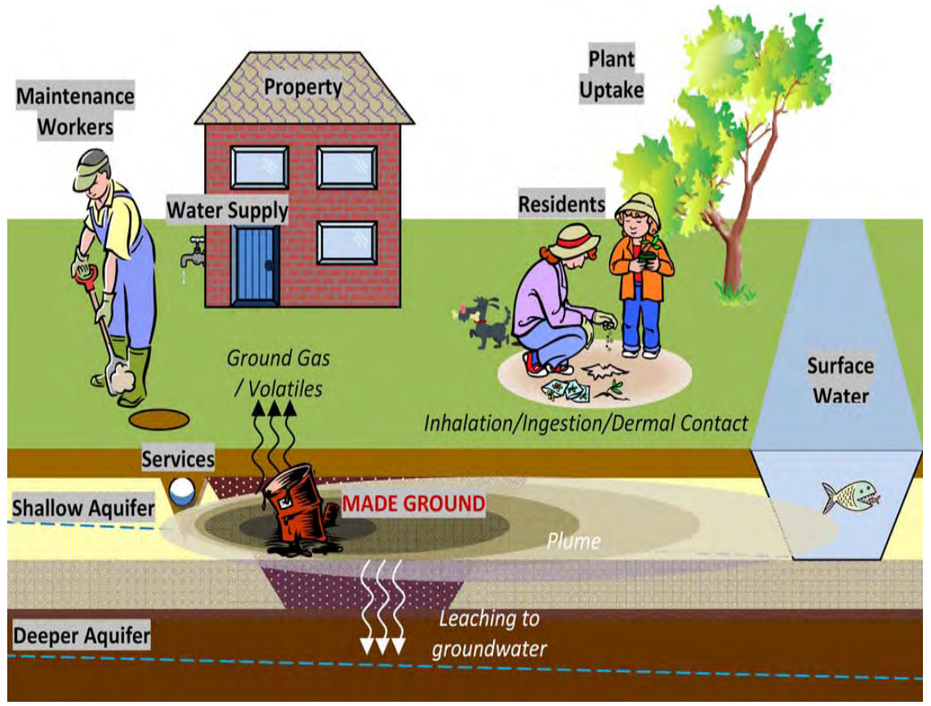
4.1. Environmental Exposure Assessment

For a site to meet the definition of contaminated land, a significant pollutant linkage must be established. A pollutant linkage consists of three parts:

- A **source** of contamination in, on, or under the ground
- A **pathway** by which the contaminant is causing significant harm (or which presents a significant possibility of such harm being caused)
- A **receptor** of a type specified in the regulations



If the three components of the pollutant linkage exist, a risk assessment will be undertaken to determine the likelihood of harm being caused and the likely nature and extent of the harm caused if the predicted event actually occurred. An area of land can only be determined as being statutorily Contaminated Land if there is evidence of significant risk. However, in the case of the water environment, significant risk or pollution just has to be suspected on the balance of probabilities and not proven.



A Conceptual Site Model

4.2. Receptors

The usual approach to risk assessment examines the source of contamination in relation to the receptor.

A receptor is defined within the guidance as;

a) a living organism, a group of living organisms, an ecological system or a piece of property listed in Table A in Annex 3, Chapter A, Part 3 section A.24 of the Part IIA Contaminated Land Statutory Guidance (2006) and is being, or could be harmed, by a contaminant;

b) the water environment, which is being, or could be, polluted by a contaminant.

c)

The table below summarises possible receptors at risk:

Human Health	Resident Children & Adults Visiting Members of Public Trespassers Staff and Maintenance Workers
Water Environment	Surface Water Wetlands Reservoirs Groundwater (*always assume bedrock aquifer is present*)
Ecological systems *Or living organisms forming part of a system within certain protected locations*	Sites of Special Scientific Interest (SSSIs) National Nature Reserves Marine Nature Reserves Local Nature Reserves Special Areas of Conservation (SACs) Candidate SAC's Special Protection Areas (SPAs) Ramsar sites (internationally recognised wetland) Areas of special protection for birds Sites of Importance for Nature Conservation (SINCs)
Property	Ancient Monuments Historic Gardens Listed Buildings Agricultural land and Livestock Allotment gardens Owned or domesticated animals Wild animals subject to shooting or fishing rights Drinking water abstraction locations

4.2.1. Human Health

The assessment considers the land use and associated users; defaults are typically residential with plant up-take, residential without plant up-take, commercial/industrial and open-space.

Residential with domestic gardens are considered to be the most sensitive as this may correspond to increased exposure to young children who will frequently play in the garden.

Children are considered to be most at risk because:

- The developing body is more efficient to the up-take of environmental toxins.
- They are likely to spend a greater proportion of time playing outside
- Behavioural characteristics of children playing and exploring their environment outside, particularly if crawling, which leads to increased exposure to soil.
- Reduced awareness of hygiene practice and consequences, dirty hand to mouth, transfer of attached materials indoors.
- Per kg body weight children ingest more, inhale more and have a greater skin surface area than adults.

Site investigation, remediation and maintenance workers who are involved with the excavation of contaminated materials are at significant risk. Health and Safety regulations along with Construction (and Design) Management regulations typically apply. Assessment of risk corresponds to occupational exposure and in Scotland this is enforced by the Health and Safety Executive (HSE). Occasionally hazards can arise to the environment and adjacent residents during site development works this is likely to incorporate a multi-disciplinary approach to resolution, and complaints would be investigated by the Local Authority, HSE and SEPA.

4.2.2. Water Environment

The "**water environment**" is defined in part 1, chapter 1, section 3 of the Water Environment and Water Services (Scotland) Act 2003 to mean "**all surface water, groundwater and wetlands**".

Surface water: inland water (other than groundwater), transitional water and **coastal water** (*but not surface water treatment systems*).

Groundwater: water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

Wetland: an area of ground the ecological, chemical and hydrological characteristics of which are attributable to frequent inundation or saturation by water and which is directly dependent, with regard to its water needs, on a body of groundwater or a body of surface water.

Coastal water: water (other than groundwater) within the area extending landward from the 3 mile limit up to the limit of the highest tide or, where appropriate, the seaward limits of any bodies of transitional water, but does not include any water beyond the seaward limits of the territorial sea of the United Kingdom adjacent to Scotland.

Pollutant inputs to the water environment can be direct or indirect. Inputs resulting from previous activity that has since ceased (i.e. historic industrial activities) are considered to be a **passive input**. Some **accidental inputs** arising from unintended activity initially causes an active input, but may eventually produce a passive input to the water environment. The water environment itself may also provide a pathway for contaminants to other receptors.

In determining what constitutes significant pollution of the water environment the local authority would have regard for the guidance and advice of the Scottish Environment Protection Agency.

4.2.3. Ecological systems

Protected ecological systems are recognised designated areas, such as Sites of Special Scientific Interest, national parks, nature reserves and other special protected or conservation areas.

Significant harm is referred to as an '*ecological system effect*' that results in irreversible or substantial adverse change or endangers protected species. In determining what constitutes such harm the local authority would be advised by Scottish Natural Heritage.

4.2.4. Property

Property is considered to be buildings, services, domestically grown produce, crops, livestock, owned or domesticated animals including wild animals that are the subject of shooting and fishing rights. Significant harm, referred to as the '*animal or crop effect*', is considered where a pollutant linkage results in a 20% diminution or loss.

Building effects are considered significant where the economic life of a building, or in the case of scheduled ancient monuments, the foreseeable future is impaired.

4.3. Contaminant Sources

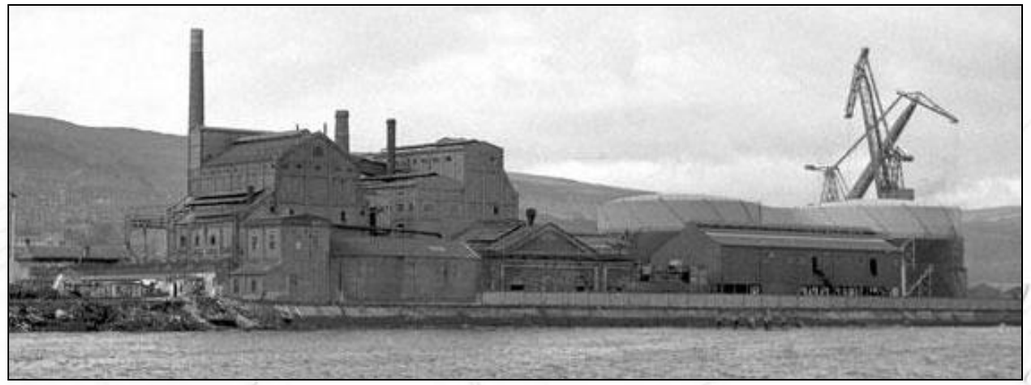
Contamination usually arises from anthropogenic (human) activities. Historically industrial processes were less concerned of the impacts to human health and the wider environment and the industrial revolution has left a legacy of land in a much deteriorated condition.

Similarly, chemical leaks, spills and deposition of wastes whether intentional or accidental may result in the contamination of land and the water environment.

In domestic scenarios, such as gardens and allotments activities may cause localised contamination of soils. It was once common practice to dig ash and clinker from the house fires as an improvement to the physical properties of clayey topsoil. Unfortunately, this practice if repeated could also introduce significant concentrations of metals and benzo(a)pyrene. Old external paintwork often contains lead, which when weathered can flake off on to the soil. Materials containing asbestos is sometimes used in the construction of roof for sheds and garages, which if allowed to disintegrate will weather into small fragments. Leakages or spillages of hydrocarbons may occur from heating oil storage tanks, garage projects and creosote treatment of wood etc.

Putrescible material contained within deposits of made ground associated with land reclamation and landfill sites may have the propensity to generate significant concentrations of methane, carbon dioxide, carbon monoxide and hydrogen sulphide. Natural peat and silty alluvial deposits may also produce adverse ground gas conditions.

Contamination from natural sources is uncommon. Minerals within the underlying geology will characterise chemical composition in soils and the water environment. However, this is usually masked by anthropogenic activities.



Typical industrial activities you would have found in Inverclyde:

Ship Building	Rifle Ranges	Quarrying
Metal Works	Landfill and Refuse Sites	Mining
Rope Works	Gasworks	Infrastructure Depots
Dockland	Refuse Destructor	Slaughterhouse
Pottery Works	Dye Works	Electronic Engineering
Munitions Factory	Flint Mill	Sugar Refinery
Paper Mills	Fuel Garages	Land Reclamation
Iron Foundries	Timber Ponds	Saw Mill
Engineering Works	Chemical Works	Timber Yards
Storehouses	Tannery	Distillery
Abattoir	Coal Depot	Engine Works
Smithy	Rivet works	Goods Yards
Sailcloth Mills	Mast Yard	Flour Mill
Fishing Net Works	Woollen Mills	Tramway Depot
Gasometers	Electricity Power Stations	Worsted Mills
Felt Works	Bottle Works	Brass Foundries
Cooperage	Metal Scrap Yard	Lighthouse Depot
Light Engineering Factories	Tent Cloth Factories	Ship Breaking Yards
Clothing Factories	Electronic Factories	Industrial Estates
Wood Laminates Factory	Builders Yards	Grain Mills
Dye Works	Carpet Factory	Soap & Candle Works
Slate Works	Boiler Makers	Chain Cable Workshop
Oil Mill	Forestry	Horticulture

5 Contaminated Land Strategy

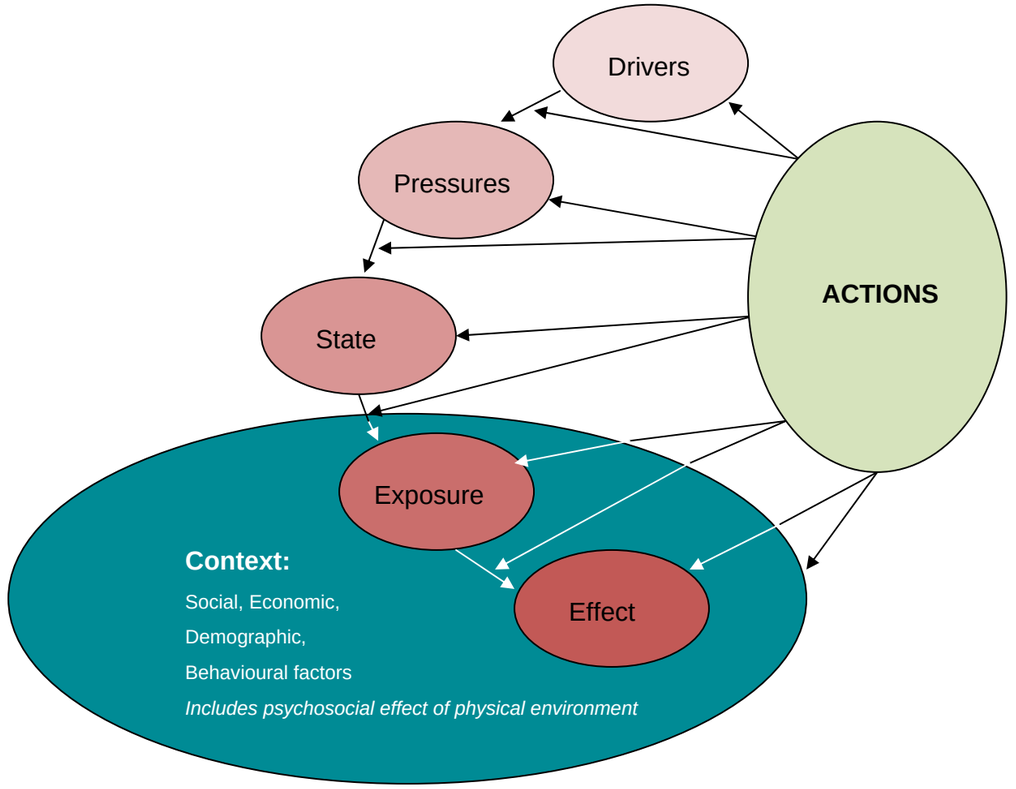
The environment is integral to everyday living and is inherently linked to public health. The assessment of contaminated land can be a complex process and technical guidance is under continuous development. Consequently, land affected by contamination within Inverclyde may be reconsidered for assessment.

With the aid of scientific studies and development of assessment methodologies, our understanding of pollutant linkages is improved. This allows us to define more realistic levels of risk associated with the site contamination, providing a more comprehensive and site specific remediation solution. This has the additional benefit of providing remediation for which the cost is justifiable and if delivered in partnership with other services can provide a long-term sustainable solution to wider issues (e.g. remediation with minor development of a contaminated derelict site could create recreational space or 'ready made' development platform for industry).

5.1. Requirements for a Strategic Approach

The Modified **DPSEEA** (Driving forces-Pressures-State-Exposure-Effects-Actions) conceptual model (Morris et al, 2006) is adopted to develop Inverclyde's strategy for the management of land contamination.

The ***drivers*** are what results in the environmental ***pressures***. This changes the ***state*** of the environment bringing about ***exposure*** to receptors, which in turn has a harmful ***effect***. The **context** considers factors that affect the outcome from a higher level of influence. ***Actions*** may be implemented at any stage to intervene and prevent the eventual harmful effect of significant contamination.



The Modified DPSEEA model *(Morris et al, 2006)*

Drivers:	*spectrum of different issues such as those which occur at a societal, economic or political level or a change in behaviour.*
Pressures:	*resulting from the drivers which act to change an environmental state.*
State:	*in response to pressures, the state of the environment is modified.*
Exposure:	*resulting from interplay between individuals and aspects of the environment which may result in increased risk of disease (or harm).*
Effects:	*the effects to human health resulting from the exposure to the environmental agents.*
Actions:	*which can be taken to reduce exposure or health effects, these include actions against each or any stages within the chain*

(WHO, 2004)

DRIVERS	PRESSURES	STATE	EXPOSURE	EFFECTS
Chain 1: Unregulated, change in land use behaviour				
• Guerrilla gardening • Promotion of growing produce in allotments and gardens • Promotion of access to and creation of greenspace	• Residual contamination in urban soils • Absence of environmental quality data • Introduction of receptors • Funding constraints	• Perceived improvement to environment • Perceived improvement to health • Significant pollutant linkages may have been created	• Inhalation, ingestion & contact • Consumption of contaminated produce	• Harm or pollution of receptors • Synergistic effect on human health • Impairment to child development
		CONTEXT	Policy: Good Places, Better Health Behavioural and Policy: promotion of healthier lifestyles Behavioural and Policy: promotion and creation of public greenspace and access	
Chain 2: Vacant and Derelict Land				
• De-industrialisation of area • High unemployment & poverty • Industrial land transferred to other parties • Land is vacant and usually unmaintained • A Part IIA designation would not bring this land back into productive use	• Absence of environmental quality data • Low land value (no incentive to obtain environmental information) • Land contamination may not be significant in its current unoccupied state. • Limited regulatory powers to improve urban environment	• Unknown pollutant linkages • Low sensitive use and therefore likely to be a lower risk than perceived • 'Vacant and Derelict Land' designation	• Inhalation, ingestion & contact • Deterioration of ecosystems • Pollution of the water environment	• Harm or pollution of receptors • Synergistic effect on human health • Impairment to child development • Limited biodiversity • Damage to building structure • Reduced value of property • Perception of the environment is poor
		CONTEXT	Physiological: environmental depression and blight Social: poorer areas tend to be nearest vacant and derelict land	
Chain 3: Land under development management				
• Economic regeneration focus • Shortage of good quality housing stock • Planning Conditions on granted development applications • Removal of contaminated landfill tax exemptions • Sustainable development	• Absence of environmental quality data • Introduction of receptors • Development must be suitable for use • Synergistic toxic effects	• Perceived improvement to environment • Significant pollutant linkages may exist	• Inhalation, ingestion & contact • Consumption of contaminated produce • Deterioration of ecosystems • Pollution of the water environment • Contact with building fabric	• Harm or pollution of receptors • Abnormal development costs • Delays to development
		CONTEXT	Regulatory: awareness and policing Policy: regeneration Behavioural: Less sustainable remediation solutions	
Chain 4: Land that may be contaminated under Part IIa EPA1990				
• Development of land prior to contaminated land regime. • Statutory duty to inspect land and bring about its remediation • High unemployment & poverty	• Absence of environmental quality data • Introduction of receptors • Local Authority funding constraints • Land is habited. • No guidance on unacceptable chemical concentrations in the soil.	• Significant pollutant linkages may exist • 'Contaminated Land' determination	• Inhalation, ingestion & contact • Consumption of contaminated produce • Deterioration of ecosystems • Pollution of the water environment	• Harm or pollution of receptors • Synergistic effect on human health • Impairment to child development • Reduced value of property
		CONTEXT	Physiological: Contaminated Land blight Health: Genetic susceptibility Social: poorer areas tend to be on or near former heavy industrial areas Social: health inequalities	

Modified DPSEEA Model (Morris, 2010): *Land Contamination*

INTERVENING ACTIONS		***Where this is applied in the STRATEGY…***
P1-4:	Identification of land which may be affected by contamination i.e. associated with industrial processes, landfill and other discharges	**Part IIa Inspection Strategy** *These actions are integral to the **inspection strategy** which is a statutory requirement of the Environmental Protection Act 1990.*
P1-4 & C4:	Routine intrusive environmental inspections for the gathering of environmental information of the quality of land and water resources	
P4:	Apply to the Council committee for funding of statutory investigations	
P1, 2 & 4:	Identify funding streams that will allow the investigation, assessment, remediation and environmental improvement of land	
P1-4:	Identification of sensitive receptors by characterising land-use and physical geographical characteristics	**Part IIA Remediation Strategy** *These actions are a statutory requirement on the identification of any site as contaminated land.*
P4:	Prioritise resources and progress site inspections – information management and assessment to be consistent with current practice and corporate policy.	
P4:	Identification and determination of Contaminated Land to be remediated using regulatory powers (i.e. Part IIA of the environmental protection act)	
S4	Bring about the remediation of sites determined as Contaminated Land, with consideration the council's policies on sustainability, waste minimisation and reducing our carbon footprint	

C1-3:	Identification of key stakeholders involved in regeneration, property development, development management and other regulators	**Development Management** *These actions are enabled by development management, which is regulated by the Planning Authority and Building Standards and includes statutory consultation with the Contaminated Land Officer*
C3:	A statutory consultee in the development management process, providing guidance and advice to Planning and Building Standard officers	
C3:	Proactive input to the monitoring of contaminated land related conditions for discharge	
C1 & 3:	Provide access to technical guidance and advice to developers consultants	
S2 & 4:	Redevelop land with remediation of and confirmed contamination one of the objectives for the site	

D1&2, C4:	Provide specific guidance and advice to monitored land uses and behaviours (e.g. hygiene for allotment gardeners)	**Communication Strategy & Liaison** *Initially a generic or corporate approach to enable contribution from a broad range of stakeholders. However, refinement of the communication strategy is desirable on a project specific basis.*
C1-4:	Creation of stakeholder working groups to raise awareness, improve knowledge transfer and transparency	
P1-4:	Participation in technical working groups for the development of knowledge, skill and to contribute to the evolution of policy and guidance	
D1-4:	Develop partnership or collaborations for resolving multiple problems associated with vacant and derelict land and dilapidated urban environments	

5.2. Aims and Objectives of the Strategy

Social, economic and environmental **regeneration**, **partnership** working, **sustainability** and **equality** of opportunity are the principles that form the basis of all Inverclyde Council Strategies.

These principles are incorporated in the revision of the strategy for the management of land contamination by Inverclyde Council.

The aim of the strategy is to provide management of land contamination within Inverclyde with effective and transparent stakeholder communication.

5.2.1. Objectives

- Develop and maintain an information management system for the collation and storage of land quality data that is harmonized with other services and procedures.
- Develop and maintain a resource prioritisation model.
- Inspect and assess land identified as being affected by contamination bringing about proportional remediation.
- Provide appropriate advice and guidance in relation to land contamination and other related matters.
- Publish strategy for management of land contamination with supporting links and other publications on-line.
- Establish and participate in multi-disciplinary collaborations and partnerships to improve effectiveness of advice and guidance.

5.3. Inspection Strategy

The local authority is required to adopt a strategic approach to conducting individual inspections of land within its area. This should;

i. Be rational ordered and efficient;
ii. Be proportionate to the seriousness of any actual or potential risk;
iii. Seek to ensure the most pressing and serious problems are identified first;
iv. Ensure resources are prioritised on land were significant pollutant linkages are most likely to be present; *and*
v. Ensure that the local authority efficiently identifies requirements for the detailed inspection of particular land.

The initial identification of potentially contaminated land sites was desk based using GIS and incorporated information from historical and geological mapping, land use and various water environment related datasets to inspect the entire Inverclyde area.

Subsequent site inspections of these identified potentially contaminated land sites followed accumulating increasingly detailed information that is *scientifically-based*, *authoritative*, *relevant* and *appropriate* towards developing each site-specific conceptual site model.

The definition of contaminated land is based upon the principles of risk assessment. A risk assessment considers

a) the probability, or frequency of occurrence of a pollutant linkage; *and*
b) the magnitude (including seriousness) of the consequences.

The potential consequences that may arise from pollutant linkages are inherent to each pollutant linkage. Even following exposure, the likelihood of significant harm resulting is probabilistic and will depend on the likely susceptibility of an individual receptor to the contaminant and the frequency and duration of exposure.

Comparison of magnitude of consequences against probability

	Magnitude of the Consequences			
Probability	**Severe**	**Medium**	**Mild**	**Minor**
High Likelihood	**Very High**	**High**	**Moderate**	**Moderate/Low**
Likely	**High**	**Moderate**	**Moderate/Low**	**Low**
Low Likelihood	**Moderate**	**Moderate/Low**	**Low**	**Very Low**
Unlikely	**Moderate/Low**	**Low**	**Very Low**	**Very Low**

5.3.1. Phase 1 Risk Assessment with Reconnaissance

Desk based researches and reconnaissance to produce a conceptual site model with respect to the current land uses and activities. This then contributes to a qualitative assessment of significant pollutant linkages being realised.

A reconnaissance is a walk over survey which examines the site condition and usage. Consideration is also given to access, health, safety and environmental hazards in anticipation of future fieldwork.

5.3.2. Phase 2 Risk Assessment

This phase is the gathering of evidence in the form of measured environmental information and by demonstrating exceedance of assessment criteria, determination that significant harm or pollution is possible.

Human health, water environment and ecological semi-quantitative assessment criteria can be generated using models developed to calculate exposure and eventual uptake. The initial level of assessment applies generic criteria or screening threshold limits to decide whether more detailed work is required.

5.3.3. Non-Routine Inspections

There may be instances where inspections have to be carried out outwith the general inspection framework.

Triggers for undertaking non-routine Inspections might include;

- Unplanned events e.g. incident such as a spill has occurred
- Introduction of new receptors e.g. housing estate, trespassing
- Voluntary Remediation - e.g. potentially liable party wishing to undertake a clean up before their land has been inspected by the local authority.
- Notification of a localised health effects (impaired child development might indicate elevated lead)
- Responding to information provided from other statutory bodies, owners, occupiers, or other interested parties.

While these occurrences may trigger non-routine inspections, these sites may subsequently be prioritised accordingly.

5.3.4. Determination of Contaminated Land

The local authority considers land to be statutorily ‘Contaminated’ if it is satisfied that both:

a) A pollutant linkage exists in respect of a piece of land; ***and***
b) That the pollutant linkage:
   i. Is resulting in significant harm being caused to the receptor in the pollutant linkage; or
   ii. Presents significant possibility of significant harm being caused to that receptor; or
   iii. Is resulting in the significant pollution of the water environment; or
   iv. Is likely to result in a significant possibility of significant pollution of the water environment being caused.

5.4. Remediation Strategy

In most cases remediation of land is funded by its redevelopment, which allows remediation to be regulated through development management.

Inverclyde Council will always provide the relevant parties with opportunity to voluntarily bring about the remediation of any land that might otherwise be determined as contaminated, providing this is equivalent or better than the standard of remediation that would be specified by the local authority at that time. It is vital for the success of such voluntary schemes that an agreed outcome is established between the local authority and other appropriate regulatory bodies (i.e. SEPA & SNH).

Under Part IIA of the Environmental Protection Act 1990, remediation is required only to break or remove pollutant linkages. As the enforcing authority, Inverclyde Council will also take into consideration the practicability, effectiveness and durability of the remediation. There is no requirement under this legislation to provide any other environmental improvement.

All information detailing contaminated land and the subsequent remediation works is available on the public register for contaminated land.

5.4.1. Remediation Notice

In any case where land has been designated as a special site or identified as contaminated land, the enforcing authority shall issue notification of the contaminated land determination to other regulating agencies, appropriate persons, the landowner and occupants.

No less that three months after the issue of the notification the local authority will serve a remediation notice which will specify the remediation actions required on the basis of the information available at that time. In most cases **a phased approach** will be adopted with additional remediation notices served until pollutant linkages have been resolved.

Under section 78A(7) of Part IIA remediation actions includes the following **assessment**, **remedial treatment** and **monitoring actions**;

> *a) The doing of anything for the purpose of assessing the condition of-*
>
> *i. the contaminated land in question;*
> *ii. the water environment affected by that land;*
> *iii. any land adjoining or adjacent to that land; or*
>
> *b) The doing of any works, the carrying out of any operations or the taking of any steps in relation to any such land or the water environment for the purpose-*
>
> *i. of preventing, minimising, or remedying or mitigating the effects of, any significant harm, or any significant pollution of the water environment, by reason of which the contaminated land is such land; or*
> *ii. of restoring the land or the water environment to its former state; or*
>
> *c) The making of subsequent inspections from time to time for the purpose of keeping under review the condition of the land or water environment.* ”

If through the assessment actions, there is indicated to be no significant possibility of harm or pollution being caused then no further assessment, remedial treatment or monitoring action can be required.

An appeal against the remediation notice may be made within twenty-one days of the notice being served. The appropriate persons will be guilty of an offence if they fail without reasonable excuse to comply with any of the requirements of the notice.

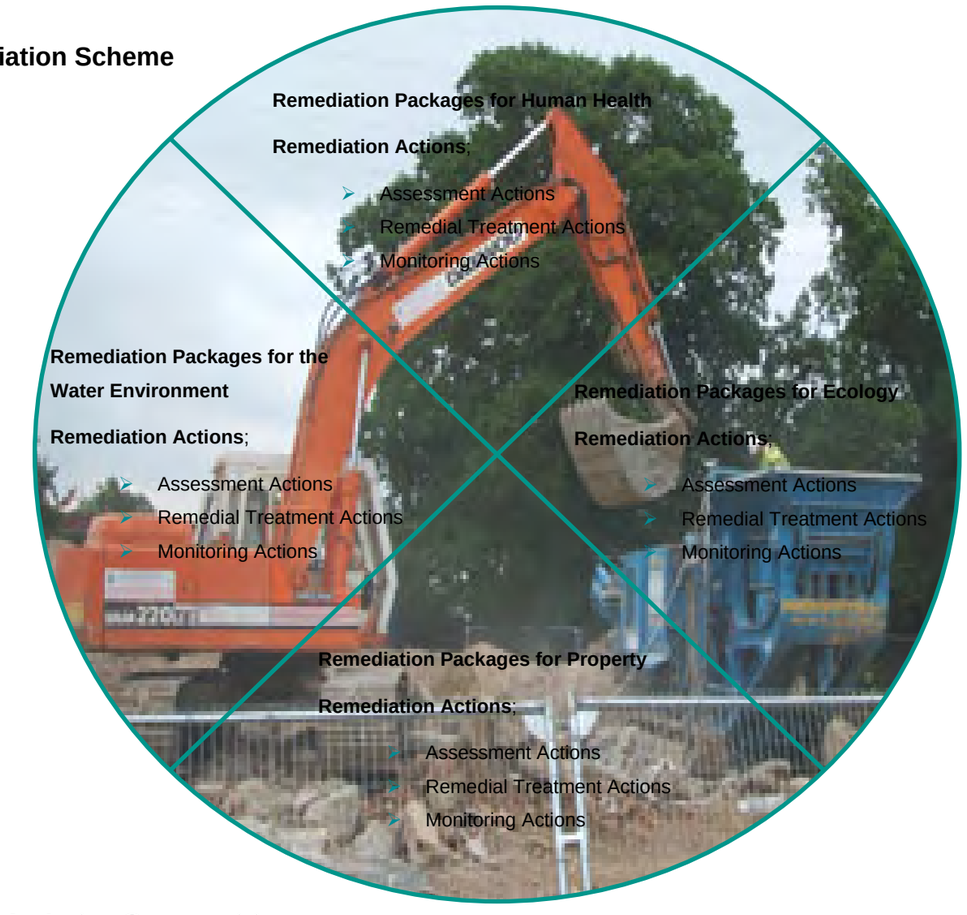
5.4.2. Remediation Options Appraisal

It is necessary to demonstrate that the most effective means of remediating a site has been considered. This appraisal might also consider other policies for sustainability, waste minimisation and carbon footprint reduction.

The appraisal will consider various technologies and/or combination of technologies that will most effectively remediate the site at reasonable cost.

A **remediation package is** the full sequence of **remediation actions**, within a **remediation scheme**, which are referable to a particular significant pollutant linkage.

Remediation Scheme



5.4.3. Cost-Benefit Analysis

At present, cost-benefit analysis applies only to site that has been entered on the Public Register of Contaminated Land. However, where human health is the receptor within the determined pollutant linkage, Inverclyde Council does not consider it appropriate to apply cost-benefit analysis.

Inverclyde Council also requires that appropriate persons agree on apportionment of liability and appropriate Environmental Insurance against any increased harm in the future.

5.4.4. Completion Report and Remediation Declaration

To demonstrate the successful completion of a remediation scheme will require verification and validation. These would be documented within a closing **completion report**, which would contain a collation of all inspection certificates, indemnity insurance documents, warranties and completion plans. It should clearly explain and provide supporting evidence for each pollutant linkage that has been resolved.

Inverclyde Council is required to issue a **remediation declaration** documenting the remediation actions it has been precluded from specifying, with the reasons actions would have been specified and the grounds which preclude them from the notice.

5.4.5. Identification of Appropriate Persons and Apportionment of Cost

An appropriate person is any person who bears responsibility for the actions which are to be carried out by way of remediation for any particular contaminated land site.

Appropriate person(s) who caused or knowingly permitted substance(s) to be in, on or under that land are considered to be '**Class A Persons**' and are only required to remediate the pollutant linkages they caused or knowingly permitted. They are also

responsible for any resulting substances created by a chemical reaction or biological process affected by the release of the original substance(s).

If, following reasonable inquiry, no appropriate person has been identified for pollutant linkages, the current landowner or occupant is considered as an appropriate person within the '**Class B liability group**'.

Orphan linkages may occur where appropriate persons become excluded from liability and liability for pollutant linkages cannot be attributed. The enforcing authority would then take on the responsibility of remediating orphaned pollutant linkages.

Costs for remediating the site is met by the appropriate person. Where there is more than one appropriate person, the costs for the remediation action will be divided proportionately between each person.

Considerations of hardship and financial impact are considered in the apportioning of costs and the local authority may consider reducing or waiving the remediation costs, if other funding is available to support this work.

5.5. Priority Actions and Timescales

Inverclyde Council produced its contaminated land inspection strategy publication as required in 2001. This publication is available for view at the council offices or can be emailed as an electronic attachment on request. As this 2001 strategy is now superseded it will not be available on our webpage.

Land that is remediated through development management takes precedence over pursuance of Part IIA actions. The redevelopment of the Waterfront coincides with the existence of identified sites that would otherwise be investigated under Part IIA of the Environmental Protection Act 1990. Land remediated under regulation of the local authority through development management negates this additional regulatory control, unless the information provided to the local authority is subsequently found to be inaccurate or the conclusions erroneous.

The identification of land contamination is an ongoing process and incorporates information submitted voluntary or through the development management process.

The initial identification of potentially contaminated land sites was completed in 2001. This information provided the original prioritised workload.

5.6. Review Mechanisms

The strategy for management of land contamination is principally an electronic document and will be reviewed annually for any amendments or corrections. Only where significant revision is necessary will wider consultation be required to take place with all relevant and appropriate parties.

6 Procedures

6.1. Information Management System

The information management system comprises a combination of electronic and hard copy documents which are retained permanently and revised to match the cataloguing system required by the database.

The original information management system adopted the ***Jacobs Babtie Section 57 Land Quality Management Database***, which was integrated with ***ESRI ArcView GIS***.

In 2008 as part of the council wide modernisation of information technology, we were required to review our information management system. The software being used was at risk of becoming dated which may result in compatibility conflicts.

In April 2009, the **UNI-form database** was adopted. The UNI-form database has limited but useful GIS mapping facility as part of the database. This GIS is useful in identifying and locating sites but unsuitable to be used in the production of report standard plans or for the editing and creation of GIS datasets.

In 2008, GIS was transferred to a new council-wide system, known as **CADCorp**. This would also require key datasets to be stored in a central data warehouse.

This synchronicity and harmonisation of software within the service and shared with other services (i.e. Planning and Building Standards) has provided the following benefits;

- The software is not limited to one dedicated officer, with access allowed to any authorised officer.
- Economies of scale in the provision of training to council employees and in maintenance of the software.
- Sharing of resources and skills between services.
- Access to shared information between services (i.e. Safer Communities and Development Management)
- Consistency in the type of information recorded.
- A single data warehouse for all council services allows information to be backed-up regularly
- The database provides a more simplified method of recording information that can be linked to reports, correspondence or any other electronic file.
- No longer require to appoint consultants to access and interrogate the database as there is now in-house knowledge.

The database and GIS is now subject to review at a corporate level. In the unlikely event that this method of recording information becomes incompatible with the needs of the strategy for management of land contamination the systems would be reviewed and adapted accordingly.

6.2. Service Requests

Service Requests are entered onto the **UNI-form database** and allocated to the appropriate team or officer. For contaminated land service requests will include enquiries and complaints, consultation requests from building standards and planning officers, and any other request for advice relating to contaminated land (and occasionally knotweed) matters.

If the information provided identifies a new potentially contaminated site, a new record will be created on the **UNI-form database** Contaminated Land module for processing.

6.3. Development Management

The contaminated land officer will be requested to provide comment on planning applications where contaminated land issues may occur. It is usual practice for standard conditions to be recommended (Annex B) this insures a consistent approach to all applicants. This information is also entered into the **UNI-form database** Contaminated Land module. In the event that the council receives future enquiries pertaining to the condition of a site this information along with any remediation actions will be recorded.

These sites will also be re-evaluated from time to time for the purposes of ensuring the continuing protection of human health and the wider environment.

6.4. Contaminated Land Module

The **UNI-form database** Contaminated Land module is where all the Land Quality Records are maintained. Each record is provided with a unique reference code corresponding to the nature of the case;

- LQR cases are Land Quality Records
- CLS cases are for determined Contaminated Land Sites
- ENQ cases are for non-site specific enquires

A summary of inspection information is entered with a list of correspondence and any scheduled targets. Supporting documentation is currently a combination of hardcopy files and electronic documents. The older files tend to be mostly hard copies. The majority of these will be scanned to be available electronically with corresponding links created in the database.

The **UNI-form database** can be interrogated to produce information for the purposes of auditing or for obtaining information concerning land contamination within the Inverclyde area. This is possible using Microsoft Access and for which training has been provided.

6.4.1. Prioritisation Model

The prioritisation model adopted is the Jacobs S57 Model. This originally set up to function within ArcView GIS and purpose built database to assess sites based on available historical, geological, water environment and land use datasets. With the modernisation and harmonisation of corporate software ArcView GIS is no longer used. The model has been transferred to a Microsoft Excel spreadsheet. This has the added benefit of being able to progressively save the scoring of the site attributes as the level of accuracy obtained from inspections is increased.

Information is collected from a wide variety of sources to develop a conceptual site model (Annex C). This information is entered into the prioritisation model, which scores attributes on the likelihood of there being a source, pathway efficiencies and sensitivity of receptors present at the site. A summary table of the risk ranking factors and score weightings is provided in Annex C.

The prioritisation of sites provides a ranked list requiring further inspection. Whilst information will reduce the ranking of the site on the inspection list, the site once identified as being potentially contaminated will never be removed from the list. The site is demonstrated to be reduced in risk, will have a lower priority. This ensures that land quality data for Inverclyde is maintained and that our understanding of the pollutant linkage mechanisms characteristic to Inverclyde is progressively developed.

6.5. Appointment of External Advisors

External advisors or consultants may be required to undertake certain works on behalf of the Council in relation to the assessment of its own land or privately owned land.

All appointments will be conducted in accordance with established procedures for appointments with adequate insurances in place such as professional indemnity and public liability.

The Local Authority and appointed parties are required to comply with the Construction (Design and Management) Regulations and appropriate health and safety procedures must be in place before work commences.

7 Communication Strategy

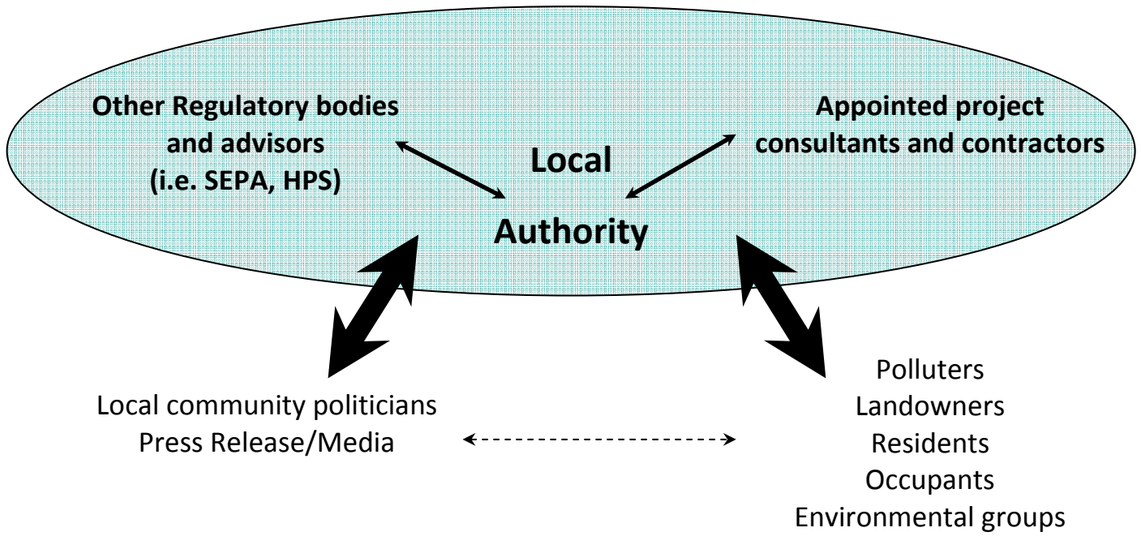
7.1. Communication Policy

Inverclyde Council's corporate vision is supported by a number of core values, which are central to how it operates, behaves and interacts with the public:

- We will be ambitious and confident
- We will be respectful, caring and trustworthy
- We will be open, honest and accountable
- We will listen, engage and respond
- We will be a supportive and caring employer
- We will strive for excellence in everything we do

Liaison and communication with people regarding land contamination issues is a major consideration in this strategy. Whether seeking or sharing information, Inverclyde Council is required to liaise with a wide range of groups, organisations and individuals.

Stakeholder Communication Plan



7.2. Stakeholder Identification

As it may be impossible, or impractical, to notify all stakeholders and interested parties, of the local authority's intentions towards a specific site, the assigned contaminated land officer will be the contact point within the Council for all enquiries, complaints, comments or concern with regard to the site.

7.2.1. The Scottish Environment Agency

SEPA are responsible for managing 'special' sites', Radioactively Contaminated Land and for publishing a national report concerning the State of Contaminated Land. The report details the progress made in implementing the contaminated land regulatory regime through which local authorities (and in some circumstances SEPA) effect remediation of land contamination that is posing unacceptable risk to health or the environment.

A framework was prepared in 2002, for the liaison between SEPA and the Local Authority in carrying out their duties under Part IIA. Under this framework the local authority has agreed to;

i. Consult with SEPA when developing their strategy documents.
ii. Consider checking whether SEPA has information relevant to the identification of land as contaminated.
iii. Have regard to advice from SEPA in relation to determination of pollution of the water environment.
iv. Seek advice from SEPA in the designation of potential special sites.
v. Notify SEPA of land identified as contaminated and land designated as a special site.
vi. Seek advice when necessary from SEPA in relation to water environment assessments and remediation work undertaken voluntary or through the development management process.
vii. Provide information to SEPA when necessary to support its regulatory functions.

7.2.2. Scottish Natural Heritage

Where contaminated sites are located near protected areas or other designated ecosystems such as SSSIs, nature reserves or listed wildlife sites, SNH will be consulted with regard to any concerns that contaminants could migrate to these adjacent areas, or the possible effects of remediation where, the removal or remediation of soils etc may have an adverse effect on established flora and fauna from both the contaminated land site and any site receiving contaminated material.

7.2.3. Landowners and Occupants

Where potentially contaminated land is to be inspected, early communication with the owner or appropriate person responsible for the land will be initiated. This is especially desirable in the case of voluntary remediation, where the Council will seek to encourage land remediation by agreement rather than by enforcement.

7.2.4. The Wider Community

The complex nature of contaminated land issues does not lend itself to easy explanation to the layperson. Development of effective methods of risk communication is therefore essential. The Council will treat any concerns raised by a member of the public seriously and with respect, recognising the importance of the issue to the individual. Local knowledge is a valuable source of data especially for “first hand” or local historical information.

Engagement will be necessary with the local community with particular reference to local concerns and the needs of their communities.

The local authority in its commitment to address the problem of contaminated land realises the importance of two way communication between itself and the wider community. To this end communication between the Council and the local community will provide a forum for any discussions on concerns within the local area with regard to contaminated land issues.

7.2.5. Other Stakeholders

There may be areas which require to be inspected where other organisational bodies have an interest or some pertinent relationship with regard to either the area in question or adjacent land.

These organisational bodies could include:

- The Scottish Government
- NHS Consultant in Public Health Medicine
- Health Protection Scotland
- Regeneration Companies
- Food Standards Agency
- Health & Safety Executive
- British Geological Survey
- West of Scotland Archaeological Service
- Ministry of Defence
- Historic Scotland
- Scottish Water
- Clyde Muirshiel Regional Park
- Clyde Area River Basin Management Plan Advisory Group

This list is not exhaustive and where possible all organisational bodies with interests or who may be involved with aspects of contaminated land issues should be consulted on a site to site basis.

7.3. Stakeholder Engagement

The gathering of information towards the inspection and determination of land requires consultations with various regulatory and non-regulatory bodies, landowners and other interested parties.

It is also important for the council to provide information to people where the land has a bearing on their own particular area of concern or interests. This will usually be a direct

dialogue with the enforcement officers concerned. However, if required the Council will formulate other communication means, such as a press release, public meeting or surgery to allow individual discussions.

7.3.1. Information Requests

Upon request under the Environmental Information (Scotland) Regulations 2004 Inverclyde is required to "take reasonable steps to organise and keep up to date the environmental information, relevant to its functions, which it holds" …"with a view to the active and systematic dissemination of that information to the public and shall make that information progressively available to the public by electronic means unless it was collected before 14th February 2003 and is not available in electronic form".

The type of environmental information held by the contaminated land would include;

- Data or summaries of data derived from the monitoring of activities that affect or are likely to affect the environment;
- Risk assessments concerning those elements of the environment

There may be a fee incurred for time and materials required to provide a response to the environmental information request. However, the enquirer would be advised in advance of any such charge and of the amount.

"A Scottish public authority may refuse to make environmental information available to the extent that-

a) it does not hold that information when an applicant's request is received;
b) the request for information is manifestly unreasonable;
c) the request for information is formulated in too general a manner and the authority has complied with its duty under regulation 9; {regulation 9 details the duty that a local authority must undertake in such an instance, to ask the applicant within 20 days of the request to provide more information in relation to and assist in providing those particulars}
d) the request relates to material which is still in the course of completion, to unfinished documents or to incomplete data; or
e) the request involves making available internal communications."

Item d) would include information from an incomplete inspection. Whilst it would be inappropriate to supply inconclusive data Inverclyde Council shall endeavour to assist with the enquiry.

7.3.2. Complaints and Notifications

Complaints and notifications relating to contaminated land matters will initially be entered onto the Councils Service Request database (Section 6.2). Service requests will be allocated as appropriate to the contaminated land officer. The officer will then contact the complainant within 10 working days.

Anonymously supplied information relating to contamination will also be logged, recorded and investigated and again be related to the priority risk assessment as required.

All complainants will be asked to supply their names and addresses and the address giving rise to the complaint, if different. The complainants' details will remain confidential. The only circumstance in which this information might be made public would be either in the case of a remediation notice being appealed in court and an adverse effect on the complainant's health was an important reason for the original contaminated land designation or if the complainant was found to be the appropriate person

7.3.3. Site Specific Liaison

Phase 1 Assessment will usually be carried out by the Council without prior contact with owners etc of land. In the event that further inspection is required the owner, occupier and, if known, the appropriate person(s), will be contacted by letter in order to explain the reasons behind the proposed walkover and the possibility that further investigation may also be required. The letter will give a minimum of five working days notice of the intended inspection. Should the proposed inspection date be unsuitable, a mutually convenient date and time can be arranged.

If the Council is of the opinion that a site is contaminated land it can require the appropriate person to undertake an assessment as part of the remediation notice.

If the possibility of a pollutant linkage exists and there is insufficient data, the Council has specific powers of entry under section 108 of the Environment Act 1995 to inspect and by intrusive investigation, gather data for the site assessment. The Council may authorise a suitably qualified person to conduct such inspections and investigations. This work would be carried out in liaison with the occupants of the site to minimise any disruption or inconvenience.

Trial Pit Excavations and Sampling

7.3.4. Contacting the Council

Individuals or groups will be able to access information, put forward their views, comment on proposals, or contact the Local Authority for information on contaminated land issues by:

- Accessing the contaminated land page on the Council's website
- Contacting the contaminated land officer by email, telephone or letter.
- Contributing to working group discussions
- Inviting the contaminated land officer to attend working group meetings

A list of relevant contact information is available in **Section 9**.

7.4. Public Register

The council has a duty to maintain a public register of remediation notices, appeals against notices, remediation statements, remediation declaration, convictions (for failing to comply with remediation notice) and any other matters relating to the contaminated land site as may be prescribed.

The register will be accessible on-line at Inverclyde Councils website. All efforts will be made to make this information available electronically. In some instances due to the volume of some associated work it may not be possible to have all information available on-line. However, an appointment to view this information can be made with the contaminated land officer and if required, copies of relevant extracts may be made available.

At present Inverclyde Council has made no determinations of contaminated land and at the time of writing (2010) there were no entries on the Public Register.

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9 Contacts

Inverclyde Council

Inverclyde Council, Safer and Inclusive Communities

Address: 40 West Stewart Street, Greenock, Inverclyde, PA15 1YA
Telephone: 01475 714 200
Email: safer.communities@inverclyde.gov.uk

Scottish Environmental Protection Agency (SEPA)

Contaminated Land Specialist Team - SEPA South West Region
Address: East Kilbride Office, 5 Redwood Crescent, Peel Park, East Kilbride, G74 5PP
Telephone: 01355 574 200
Contaminated Land Web-pages: http://www.sepa.org.uk/land/contaminated_land.aspx

Scottish Natural Heritage (SNH)

Strathclyde and Ayrshire
Address: Caspian House, Mariner Court, 8 South Ave, Clydebank Business Park, Clydebank, Dunbartonshire, G81 2NR
Telephone: 0141 951 4488

Health Protection Scotland (HPS)

Address: Clifton House, Clifton Place, Glasgow, G3 7LN
Telephone: 0141 300 1100
Email: NSS.HPSenquiries@nhs.net

Food Standards Agency (FSA) Scotland

West Scotland
Address: 6th Floor, St Magnus House, 25 Guild Street, Aberdeen, AB11 6NJ
Telephone: 01224 285187 or 01224 285100
Email: scotland@foodstandards.gsi.gov.uk
Chemical Contaminants will.munro@foodstandards.gsi.gov.uk
kasia.kazimierczak@foodstandards.gsi.gov.uk

Health and Safety Executive (HSE) Scotland

HSE West Scotland
Address: 1st Floor, Mercantile Chambers, 53 Bothwell Street, Glasgow, G2 6TS
Telephone: (Infoline) 0845 345 0055
Email: hse.infoline@connaught.plc.uk

10 Glossary

Anthropogenic	Derived from human activities.
Apportionment	The division in costs of carrying out any remediation action between two or more appropriate persons.
Appropriate person	Any person who bears responsibility for the things which are to be done by way of remediation in any particular case
Contaminant	Any substance which is in, on or under the land and which has the potential to cause harm or cause pollution of the water environment.
Class A person	A person who is an appropriate person because they caused or knowingly permitted pollution to be in, on or under the land.
Class B liability group	A person who is an appropriate person because they are the owner or occupier of the land in circumstances where no Class A person can be found with respect to a particular remediation action.
Current Use	Any land use which is currently being made, or is likely to be made and which is consistent with any existing planning permission.
Development Management	Regulatory control of development by the Planning Authority and Building Standards.
Land *that has been determined*	This is the smallest area which is covered by a single remediation action which cannot sensibly be broken down into smaller actions. Subject to this, the land is likely to be the smaller of: a) The plots which are separately recorded in the *Land Register* or are in separate ownership or occupation; and b) The area of land in which a significant pollutant linkage has been established.
Orphan Linkages	Is a significant pollutant linkage for which no appropriate person can be found, or where those who would otherwise be liable are exempted by one of the relevant statutory provisions.
Pathway	Is one or more routes or means by, or through, which a receptor: a) is being exposed to, or affected by, a contaminant, or b) could be so exposed or affected.
Pollutant	the contaminating substance
Pollutant Linkage	The relationship between a contaminant, a pathway and a receptor.
Receptor	a) A living organism, a group of living organisms, an ecological system or a piece of property which i. Is in a category listed in Table A as a type of receptor, and ii. Is being, or could be, harmed, by a contaminant; or b) A water environment which is being, or could be, polluted by a contaminant.
Remediation	The definition of 'remediation' given in section 78A(7) of Part IIA extends more widely than the common usage of the term (Environmental Protection Act 1990 as amended). It includes not only the actions to restore the "contaminated land", but also the assessment of : • the land in question; • any controlled waters affected by that land; or • any land adjoining or adjacent to the land in question. It also includes subsequent inspections to keep the condition of the land or waters under review. For the purposes of this section, 'remediation' should be understood in these terms, unless the context dictates otherwise.
Site-specific	All risk assessments are required to be specific to each individual site.
Synergistic Effects	The effect of multiple chemicals on an organism to be greater than the effect of each chemical individually as the presence of one chemical enhances the effects of the other(s).
Special Site	Contaminated land that meets one of the descriptions in the regulations, for example land on which a process subject to Integrated Pollution Control is, or has been, operated. The Regulations as amended should be referred to for further information. Special sites do not necessarily represent the most heavily contaminated land. Special site designation is the responsibility of local authorities, who are required to seek advice from SEPA. Once a special site has been designated as such, SEPA becomes the enforcing authority.
Substance	Any natural or artificial substance, whether in a solid or liquid form or in the form of a gas or vapour.
Validation	This should demonstrate that the remediation scheme successfully breaks or removes the pollutant linkages.
Verification	This should demonstrate that the works comply with the design of the remediation scheme

10.1. Common Abbreviations

BGS	British Geological Survey
CIEH	Chartered Institute of Environmental Health
CIRIA	Construction Industry Research and Information Association
CDM	Construction and Design Management
CLAN	Contaminated Land Advice Note
CLEA	Contaminated Land Exposure Assessment model
CLR	Contaminated Land Report
CSM	Conceptual Site Model
DPSEEA	Driving forces Pressures State Exposure Effects Actions
DEFRA	Department for Environment Food and Rural Affairs
EA	Environment Agency
EEA	European Environment Agency
EIA	Environmental Impact Assessment
EIC	Environmental Industries Commission
EIR	Environmental Information Request
EPA	Environment Protection Act
FSA	Food Standards Agency
GIS	Geographic Information System
HPA	Health Protection Agency
HPS	Health Protection Scotland
HSE	Health and Safety Executive
LA	Local Authority
LBAP	Local Biodiversity Action Plan
LOD	Limit of Detection
LQR	Land Quality Record
MOD	Ministry of Defence
NO	National Outcome
NICOLE	Network for Industrially Contaminated Land in Europe
NHBC	National House-Building Council
NHS	National Health Service
OS	Ordnance Survey
Part IIA	Part IIA of the Environmental Protection Act 1990
PAH	Poly-Aromatic Hydrocarbons
POP	Persistent Organic Pollutants
PRB	Permeable Reactive Barriers
PPM	Parts Per Million
RBCA	Risk-Based Corrective Action model
RBMP	River Basin Management Plan
RCL	Radioactive Contaminated Land
REHIS	Royal Environmental Health Institute for Scotland
SAC	Special Area of Conservation
SCLF	Scottish contaminated Land Forum
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SIMD	Scottish Index of Multiple Deprivations
SINC	Site of Important Nature Conservation
SNIFFER	Scotland, Northern Ireland Forum for Environmental Research
SNH	Scottish Natural Heritage
SOA	Single Outcome Agreement
SPA	Special Protection Area
SPOSH	Significant Possibility of Significant Harm
SPL	Significant Pollutant Linkage
SSSI	Site of Special Scientific Interest
SVDL	Scottish Vacant and Derelict Land
TPH	Total Petroleum Hydrocarbons
USEPA	US Environment Protection Agency
WHO	World Health Organisation
WOSAS	West of Scotland Archaeological Service

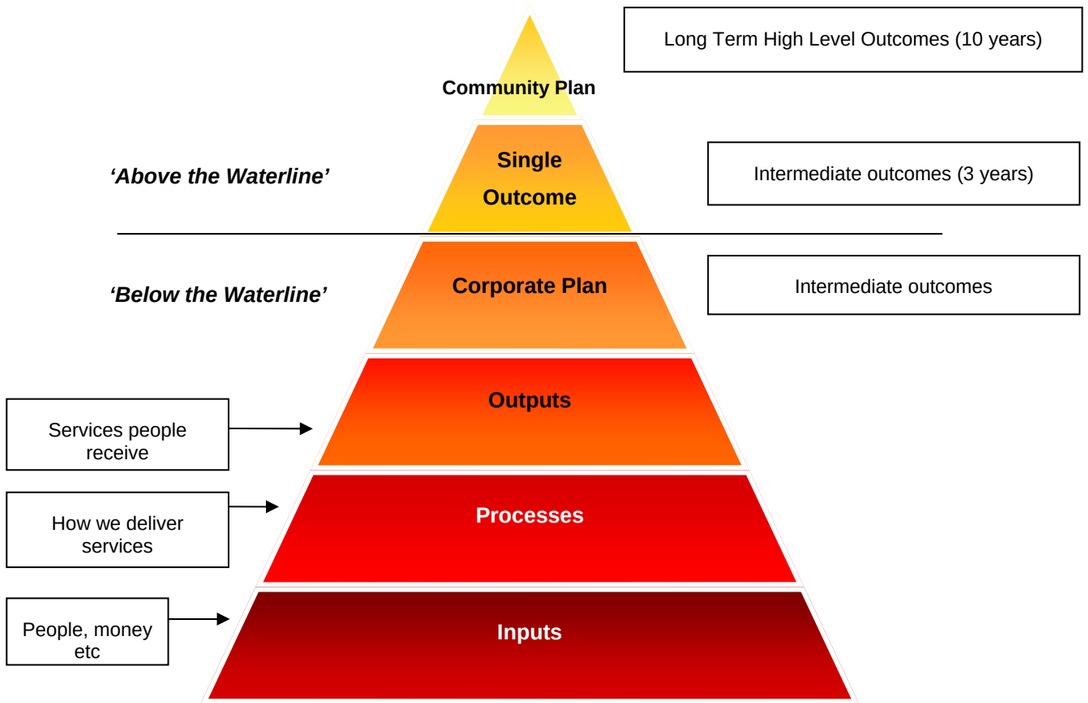
Annex A

Corporate Strategies for Inverclyde

The Community Plan (2008-2018)

The ***Community Plan*** sets out a vision for Inverclyde and identifies the six key areas to be tackled by both the Council and our partners to help achieve this vision.

The ***Single Outcome Agreement*** localises the 15 national outcomes identified by the Scottish Government and has been informed by the Community Plan.



The Community Plan Vision

The vision shared by all the partners for the future of Inverclyde…

"Working together in partnership we will help to develop a confident, inclusive Inverclyde, with safe, sustainable, healthy, caring communities and a thriving prosperous economy, where everyone is encouraged to achieve their potential and can make a positive contribution to the area"

In order to achieve this vision for Inverclyde, the following six desirable outcomes have been identified within the community plan report;

- The health, including mental health and wellbeing, of people in Inverclyde is improved, combating health inequality and promoting healthy lifestyles.
- A positive culture change will have taken place in Inverclyde in attitudes to alcohol, resulting in fewer associated health problems, improved safety and reduced crime rates.
- Everyone who is able to work can access job opportunities, developing skills to progress while in work, and support is available for those furthest from the labour market.
- Inverclyde has a thriving business community, with better support, and a good small to medium enterprise start up and sustainability rate.
- Communities of geography and interest are more able to identify, articulate and take action on their needs and aspirations, but are also able to take responsibility for their communities available to them and bringing about an improvement in the quality of community life in Inverclyde.
- Inverclyde's environment is protected and enhanced for future generations, with one of the lowest carbon footprints, per capita, of any local authority area in Scotland.

The Single Outcome Agreement (2009-2011)

In November 2007 national and local government signed a historic concordat, which committed both to moving towards Single Outcome Agreements (SOAs) for all 32 of Scotland's councils and extending these to Community Planning Partnerships.

This concordat sets out the terms of a new relationship between the Scottish Government and local government, based on mutual respect and partnership and defines how funding is to be provided to local government.

Based on a range of factors including local evidence, knowledge of the area, partner experience and the priorities and aspirations of the local community the following **Strategic Outcome Agreements** have been established for Inverclyde:

SOA 1. Inverclyde's population is stable with a good balance of socio-economic groups.

SOA 2. Communities are stronger, responsible and more able to identify, articulate and take action on their needs and aspirations to bring about an improvement in the quality of community life.

SOA 3. The area's economic regeneration is secured.

SOA 4. Economic activity in Inverclyde is increased, and skills development enables both those in work and those furthest from the labour market to realise their full potential.

SOA 5. The health of local people is improved, combating health inequality and promoting healthy lifestyles.

SOA 6. A positive culture change will have taken place in Inverclyde in attitudes to alcohol, resulting in fewer associated health problems, social problems and reduced crime rates.

SOA 7. All our young people have the best start in life.

SOA 8. Inverclyde is a place where people want to live now whilst at the same time safeguarding the environment for future generations.

The Purpose of the Scottish Government is "***to focus Government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth***". This Purpose is supported by the following fifteen **National Outcomes**;

NO 1. We live in a Scotland that is the most attractive place for doing business in Europe.

NO 2. We realise our full economic potential with more and better employment opportunities for our people.

NO 3. We are better educated, more skilled and more successful, renowned for our research and innovation.

NO 4. Our young people are successful learners, confident individuals, effective contributors and responsible citizens.

NO 5. Our children have the best start in life and are ready to succeed.

NO 6. We live longer, healthier lives.

NO 7. We have tackled the significant inequalities in Scottish society.

NO 8. We have improved the life chances of children and young people and families at risk.

NO 9. We live our lives free from Crime, Disorder and Danger.

NO 10. We live in well-designed, sustainable places where we are able to access the amenities and services we need.

NO 11. We have strong, resilient and supportive communities where people take responsibility for their own actions and how they affect others.

NO 12. We value and enjoy our built and natural environment and enhance it for future generations.

NO 13. We take pride in a strong, fair and inclusive national identity.

NO 14. We reduce the local and global environmental impact of our consumption and production.

NO 15. Our public services are high quality, continually improving, efficient and responsive to local people's needs.

Annex B

Standard Planning Conditions for Addressing Potential Land Contamination Issues

1. That prior to the start of development, details of a survey for the presence of Japanese Knotweed shall be submitted to and approved in writing by the planning authority and that, for the avoidance of doubt, this shall contain a methodology and treatment statement where any is found. Development shall not proceed until treatment is completed as per the methodology and treatment statement. Any variation to the treatment methodologies will require subsequent approval by the planning authority prior to development starting on site.

Reason: To help arrest the spread of Japanese Knotweed in the interests of environmental protection.

2. That the development shall not commence until an environmental investigation and risk assessment, including any necessary remediation strategy with timescale for implementation, of all pollutant linkages has been submitted to and approved, in writing by the Planning Authority. The investigations and assessment shall be site-specific and completed in accordance with acceptable codes of practice. The remediation strategy shall include verification/validation methodologies. This may be incorporated as part of a ground condition report and should include an appraisal of options.

Reason: To satisfactorily address potential contamination issues in the interests of environmental safety.

3. That on completion of remediation and verification/validation works and prior to the site being occupied, the developer shall submit a Completion Report for approval, in writing by the Planning Authority, confirming that the works have been carried out in accordance with the remediation strategy. This report shall demonstrate that no pollutant linkages remain or are likely to occur and include (but not limited to) a collation of verification/validation certificates, analysis information, remediation lifespan, maintenance/aftercare information and details of imported/disposed/reused materials relevant to the site.

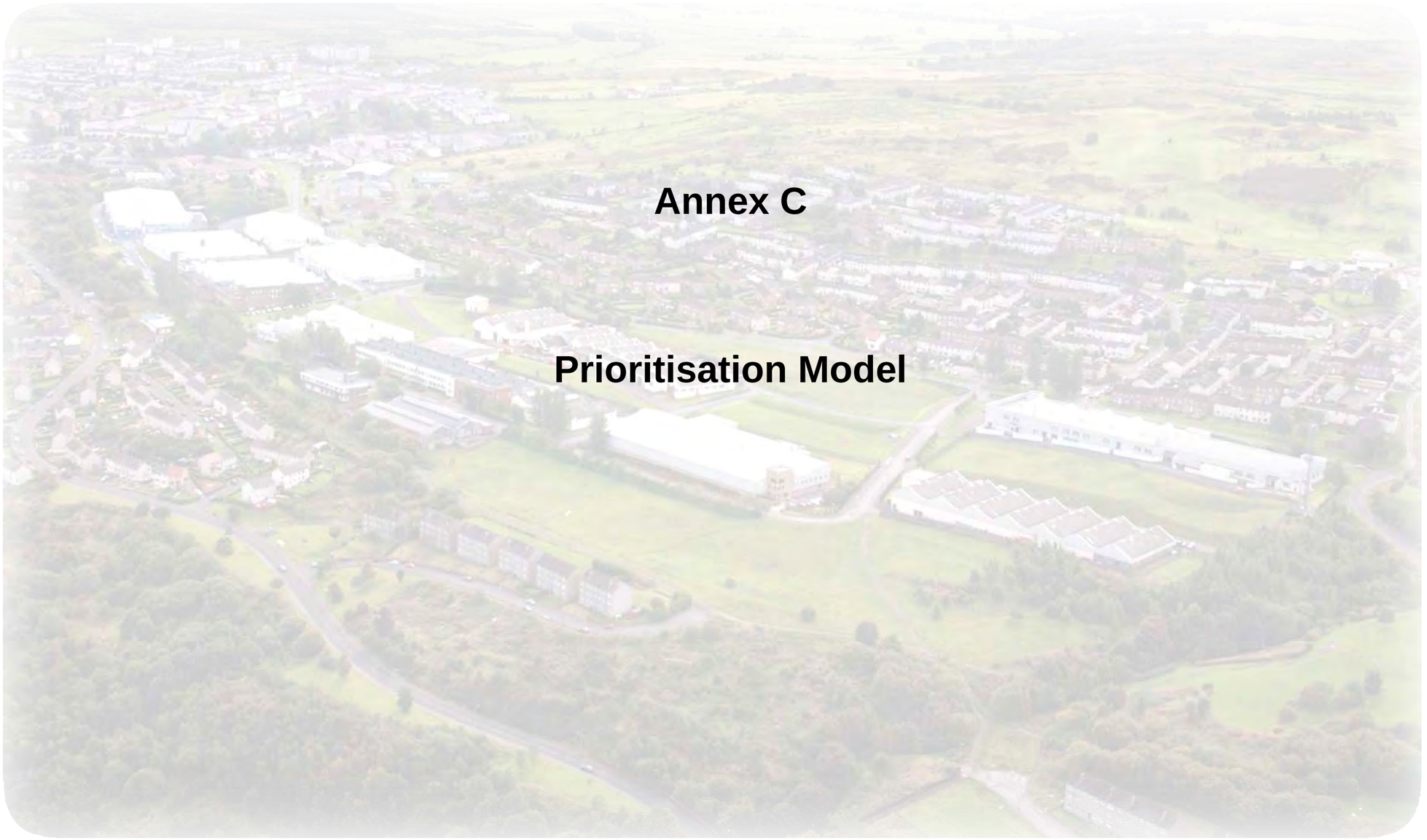
Reason: To provide verification that remediation has been carried out to the authority's satisfaction.

4. That the presence of any previously unrecorded contamination or variation to reported ground conditions that becomes evident during site works shall be brought to the attention of the planning authority within one week. Consequential amendments to the Remediation Strategy shall not be implemented unless it has been submitted to and approved, in writing by the Planning Authority.

Reason: To ensure that all contamination issues are recorded and dealt with appropriately.

5. That no material shall be imported onto the site until written details of the source of the imported material has been submitted for approval, in writing by the Planning Authority. The details which shall be submitted no later than four weeks prior to the material being imported onto the site shall include; The source of the imported material, any potential source(s) of contamination within 50 metres of the source of the material to be imported and verification analysis information. The material must not be imported on to the site until written approval has first been received from the Planning Authority. The material from the source agreed only shall be imported in strict accordance with these agreed details.

Reason: To protect receptors from the harmful effects of imported contamination.



Annex C

Prioritisation Model

Information Collection

Although the following information sources will be used to identify potential contamination sources, pathways and receptors this will not preclude information being sourced from elsewhere (e.g. national map library, local museums, libraries, submitted consultants' reports etc.)

Information Source	Information Type	Use
Historic Maps	Digital maps purchased from ordnance Survey (through Landmark)	To identify sources
Geological maps	1:50,000 solid, artificial and drift geology maps from British Geological Society.	To characterise sources and pathways.
Hydrogeological Maps	Ground Water Vulnerability Maps produced by British Geological Society	To identify receptors (controlled waters)
MLURI	Agricultural land, moors/wetland, forest/woodland, recreational land, quarries.	To identify sources/receptors.
Environmental Services Records	Records of Complaints & Investigations. Closed Landfill Sites.	To identify known information on contamination.
Planning Services Records including Building Control	Detailed Planning Records of development in the area, including information on ground conditions presented in surveys. Also responsible for completing the Scottish Vacant and Derelict Land Survey.	To identify known information on contamination.
Scottish Environment Protection Agency (SEPA) Records	1) Published Records of River Quality, discharge to Controlled Waters. 2) Pollution events, aquifer classification, surface water classifications, bathing waters, shellfish waters. 3) Public Registers of Integrated Pollution Control of Authorised Part A & Part B Processes. 4) Waste Management Licences. 5) Radioactive Substances Registers.	To identify sources of contamination, pathways, receptors.
Industry Profiles	Produced by Department of Environment Information on processes, materials and wastes associated with individual industries.	To identify sources.
Company Records	Information about the company etc.	To identify sources.
Anecdotal	Local knowledge.	To identify sources.
Health & Safety Executive (HSE)	Records of accidents/incidents.	To identify information on contamination.
Aerial Photographs	Visual evidence of contamination, use of site published by National Association of Aerial Photographic Libraries.	To identify sources of contamination.
Trade Directories	Information on past use of site. Available from local library.	To identify sources of contamination.
District Local Plan	Published by local authority and is a valuable source of up to date information on land use.	To identify receptors and particularly historic monuments and protected areas of the environment.
Scottish National Heritage	Presence and nature of SSSI's, SPA's, SAC's & SINC's.	To identify receptors.
Historic Scotland	Records of historic/protected buildings and archaeological sites.	To identify receptors.
Scottish Executive	Use of land, assessment of animal or crop effects.	To identify receptors, pathways.
Trading Standards	Licensed petrol tanks.	To identify sources.
Coal Board	Mines and quarries	To identify sources.

Summary Table of Risk Ranking Factors and Score Weightings

Code	Pollutant Linkage Component	Ranking Factors	Description	Score
SS1	**Source Severity**	**Contaminative use or activity classification**	High	10
			Medium	5
			Low	2
PE1	**Pathway Efficiency**	**Artificial Geology Composition**	Open/void	10
			Made Ground	8
			Unknown Made Ground	7
PE2	**Pathway Efficiency**	**Drift Geology Composition**	Granular	10
			Mixed granular/cohesive	7
			No Drift	7
			Cohesive	5
PE3	**Pathway Efficiency**	**Solid Geology Composition**	Coarse grained rock	10
			Mixed sequences or unknown lithology	8
			Medium/Fine grained rock	7
			Fine grained rock	5
			Extremely fine grained rock	4
PE4	**Pathway Efficiency**	**Mine Entries**	Within 50m radius	2
			>50m and <250m boundary	1
			>250m of boundary	0

Code	Pollutant Linkage Component	Ranking Factors	Description	Score
RS1	**Receptor Sensitivity**	**Human Receptors**	Allotments/Caravan Parks/Residential	20
			Educational Establishments	17
			Public Open Spaces	10
			Commercial / Industrial / Farming	5
			Other End-use	2
RS2	**Receptor Sensitivity**	**Groundwater Vulnerability**	Devonian & Triassic	18
			Drinking Water Abstraction Location	17
			Source Protection 50m radius (inner)	17
			Source Protection 100m radius (outer)	14
			Significant Aquifer Resource Potential	14
			Moderate Aquifer Resource Potential	8
			Non-Aquifer	0
RS3	**Receptor Sensitivity**	**Surface Waters**	Within 50m of a **High** status feature	17
			Within 50m of a **Good** status feature	15
			Within 50m of a **Moderate** status feature	14
			Within 50m of a **Poor** status feature	13
			Within 50m of a **Bad** status feature	12
			Within 50m of an **Unclassified** feature	10
			Within 50m of **High Tide Water Mark**	10
RS4	**Receptor Sensitivity**	**Ecological Receptors**	Ramsar/SAC/SPA	8
			SSSI	6
			Ancient Woodland	5
			Raised bogs / intermediate bogs	4
			SINC	2
			Protected site within 100m	1
			None	0
RS5	**Receptor Sensitivity**	**Heritage Receptors**	Ancient Monument / Listed Building	2
			Site of Archaeological Significance	2
			Historic Gardens and Landscapes	1

Source*: Babtie Group [Jacobs] (2002)* ***Identification, Prioritisation & Risk Ranking of Potentially Contaminated Land in Inverclyde. Methodology.*** *Babtie Group, Glasgow. June 2002*.

The accompanying guidance provides more detailed scoring including buffer zones around sensitive receptors to allow further refinement of the site ranking.

Prioritisation of Risk: Scoring Calculations

Source Severity Scoring		
Likelihood of contaminative activities associated whit historical land use (high, medium or low risk)	**SS1**	Normalising factor = 40.815

Pathway Efficiency Scoring		
Artificial Geological Pathways	**PE1**	Normalising factor = 0.340
Drift Geological Pathways	**PE2**	
Solid Geological Pathways	**PE3**	
Mine Entry Proximity	**PE4**	

Receptor Sensitivity Scoring		
Human Receptors	**RS1**	Normalising factor = 28.226
Groundwater Receptors	**RS2**	
Water Environment Receptors	**RS3**	
Ecological Receptors	**RS4**	
Heritage Receptors	**RS5**	

The total scores are normalised by multiplying each component score by a unique weighting factor. Normalisation is an arithmetical method used to prevent any part of the pollutant linkage gaining an unwarranted dominance.

Source: *Babtie Group [Jacobs] (2002)* ***Identification, Prioritisation & Risk Ranking of Potentially Contaminated Land in Inverclyde. Methodology.*** *Babtie Group, Glasgow. June 2002*.

Normalised Source Severity Score (SS_n)

$$SS_n = \frac{SS1 \times 408.153}{10}$$

Normalised Pathway Efficiency Score (PE_n)

$$PE_n = \frac{(PE1+PE4) \times (PE2+PE30 \times 408.153}{1200}$$

Normalised Receptor Sensitivity Score (RS_n)

$$RS_n = \frac{\sqrt{\frac{(RS1^2+RS2^2+RS3^2+RS4^2+RS5^2)}{5}} \times 408.153}{14.46}$$

Total Normalised Risk Ranking Score (TS_n)

$$TS_n = SS_n + PE_n + RS_n$$

This risk ranking system allows Inverclyde Council to priorities identified sites based on source-pathway-receptor information. As the information is refined it is possible for the authority to re-evaluate the scoring and thus reprioritise the site.

The prioritised sited are then categorised into the following **High**, **High-Moderate**, **Moderate-Low** and **Low** risks.

TS_n Score Range	Risk Category
Greater than 895	High
550 – 895	High-Moderate
340 – 549	Moderate-Low
Less than 340	Low