

Unconventional Gas in Scotland:

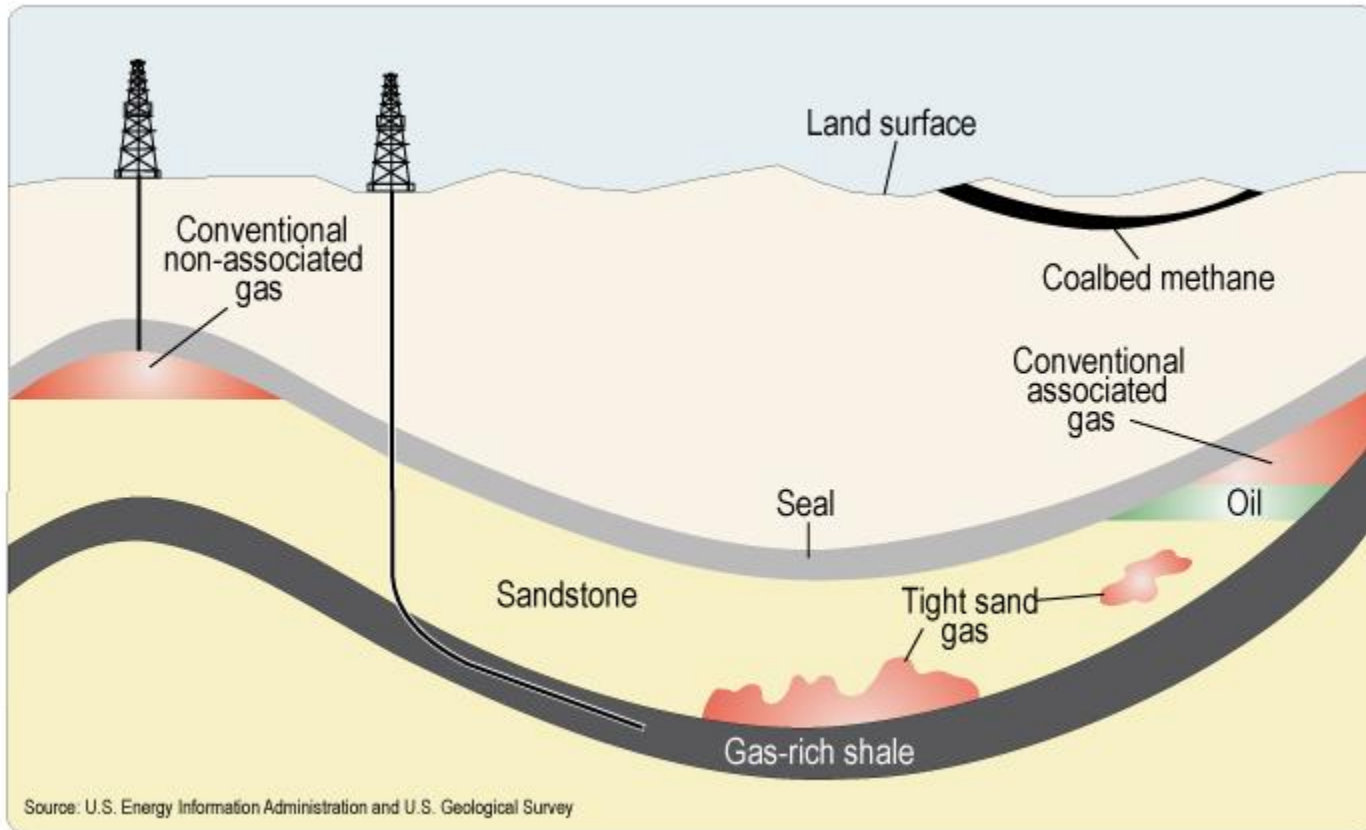
Environmental risks and regulations



Scottish Environment Protection Agency (SEPA)

- Scotland's environmental regulator
- Protect and improve the environment
- Regulate and monitor
- Non departmental public body

Unconventional Gas: Shale or Coal Bed Methane

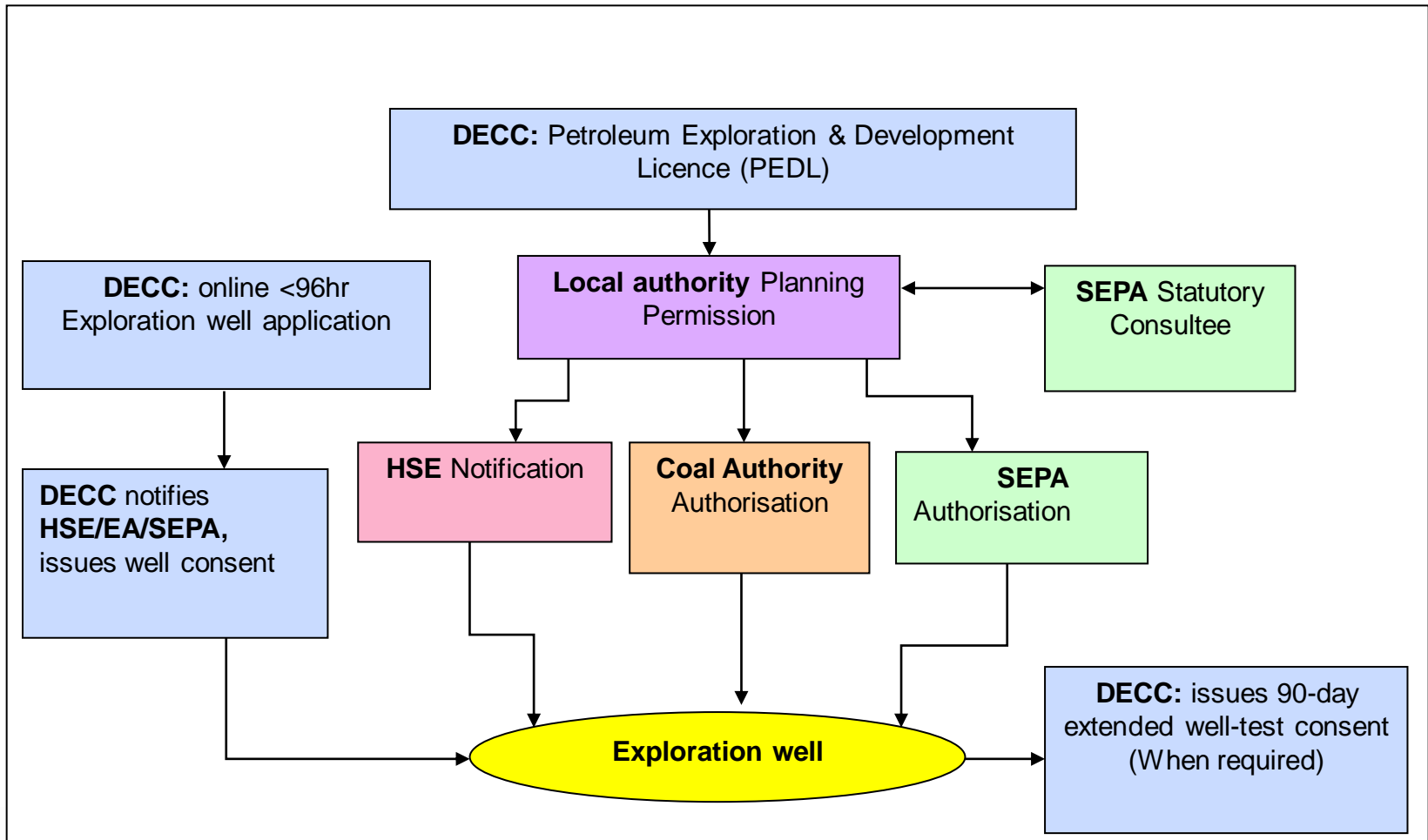


28 January Fergus Ewing MSP made a statement to Parliament announcing a moratorium on granting consents for unconventional oil and gas developments in Scotland

The moratorium will be in place while the Scottish Government completes the following work:

- Undertake a full public consultation on unconventional oil and gas extraction;
- Commission a full public health impact assessment;
- Conduct further work into strengthening planning guidance;
- Look at further tightening of environmental regulation.
- The Scottish Government is issuing a Direction to SEPA and local planning authorities that applications are referred to them for determination.

Regulatory Map



Onshore PEDLs in Scotland

Hurricane Exploration

PEDL160

Dart Energy

Dart Energy and Ineos

PEDL133

PEDL161

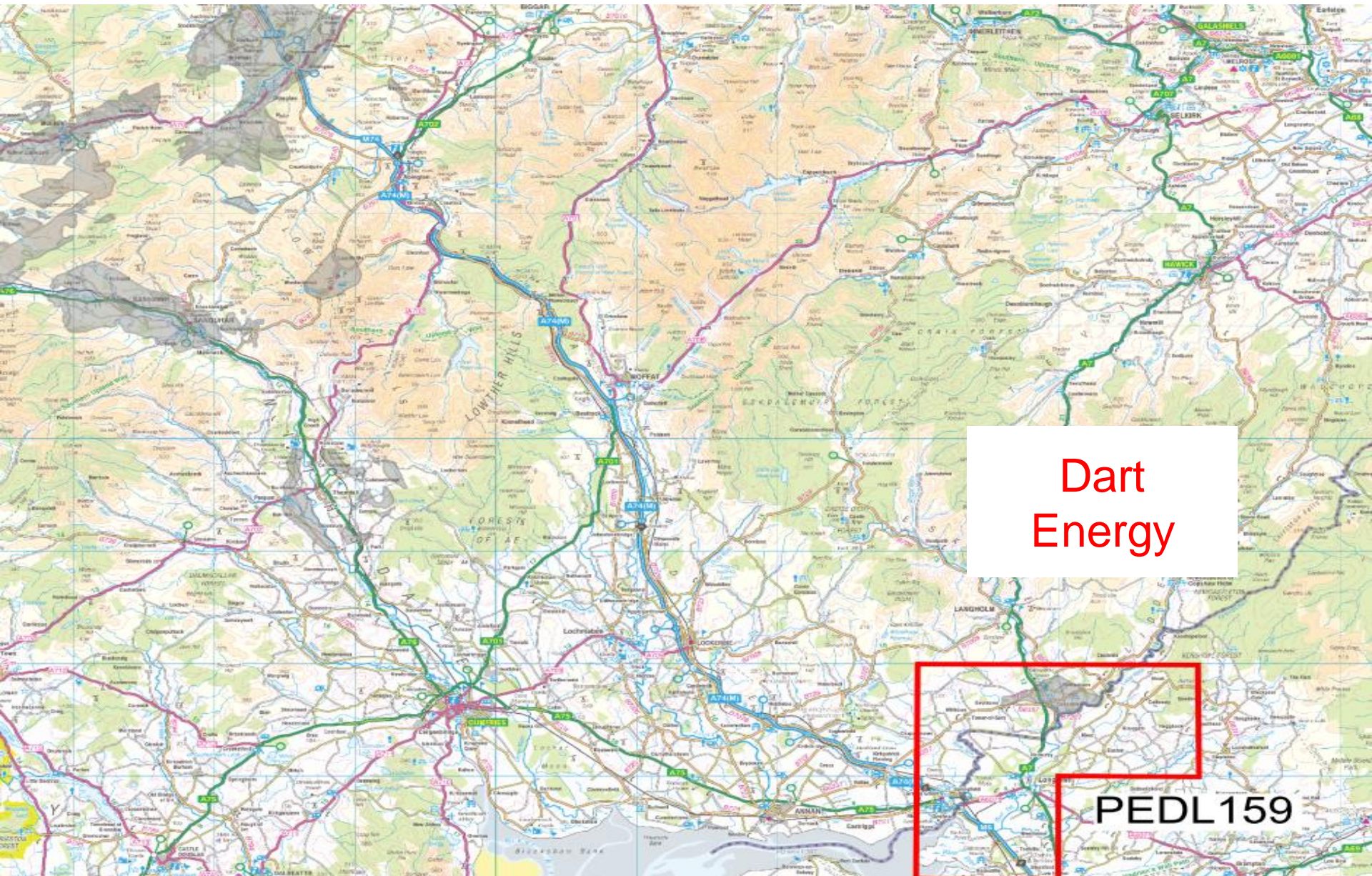
PEDL162

PEDL163

Dart Energy

REACH and Ineos

Onshore PEDLs in Scotland

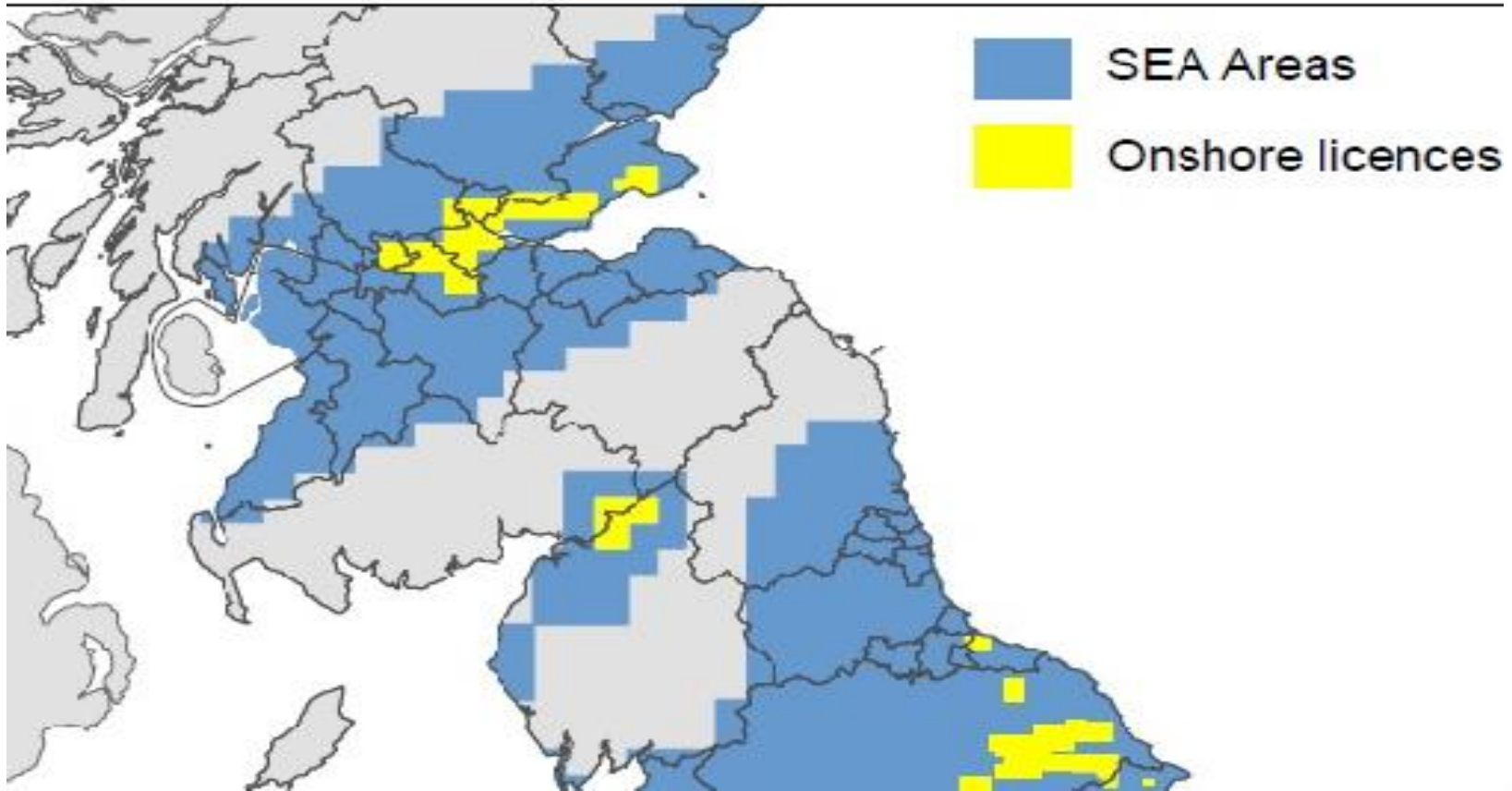


Dart
Energy

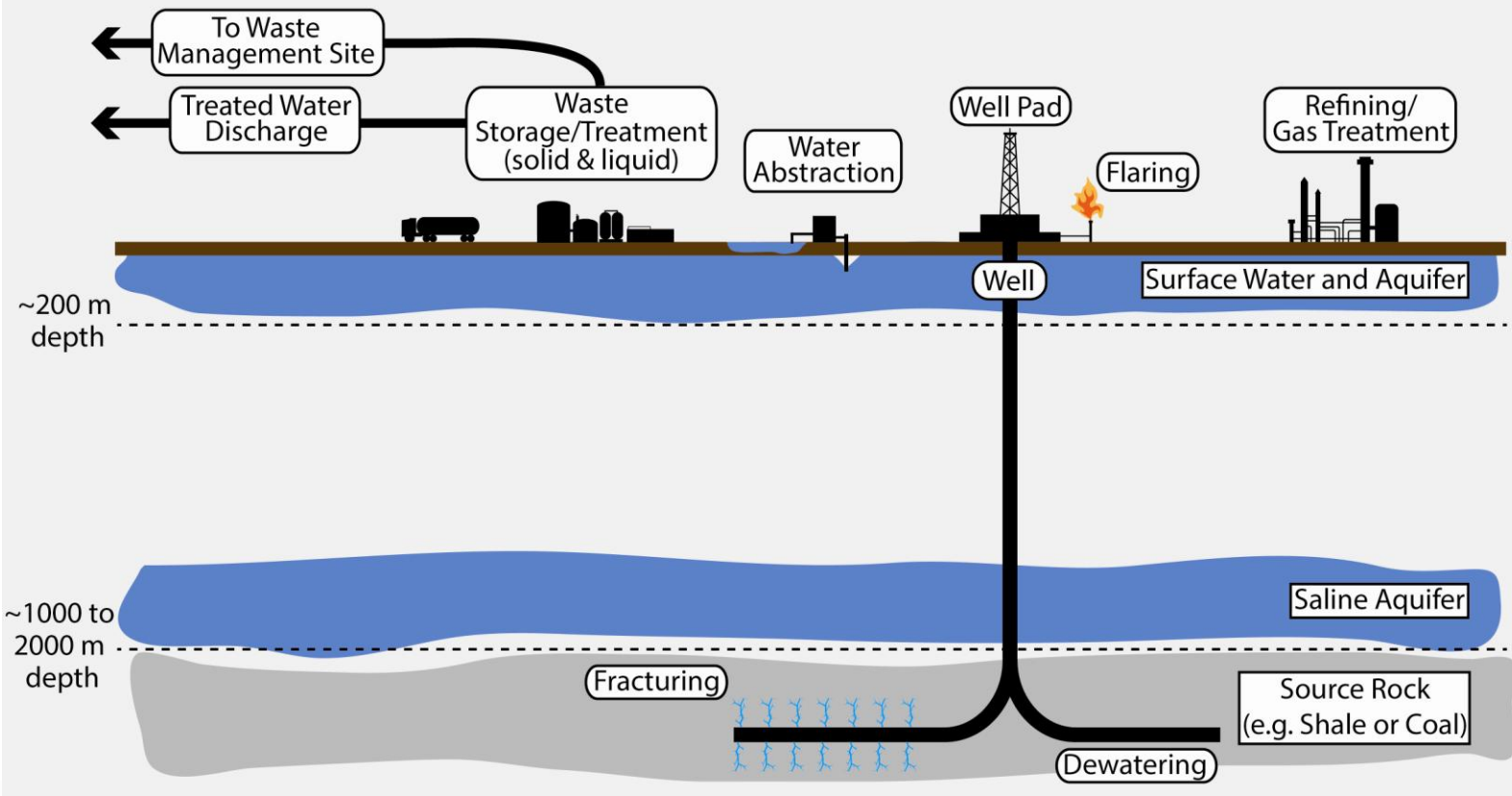


PEDL159

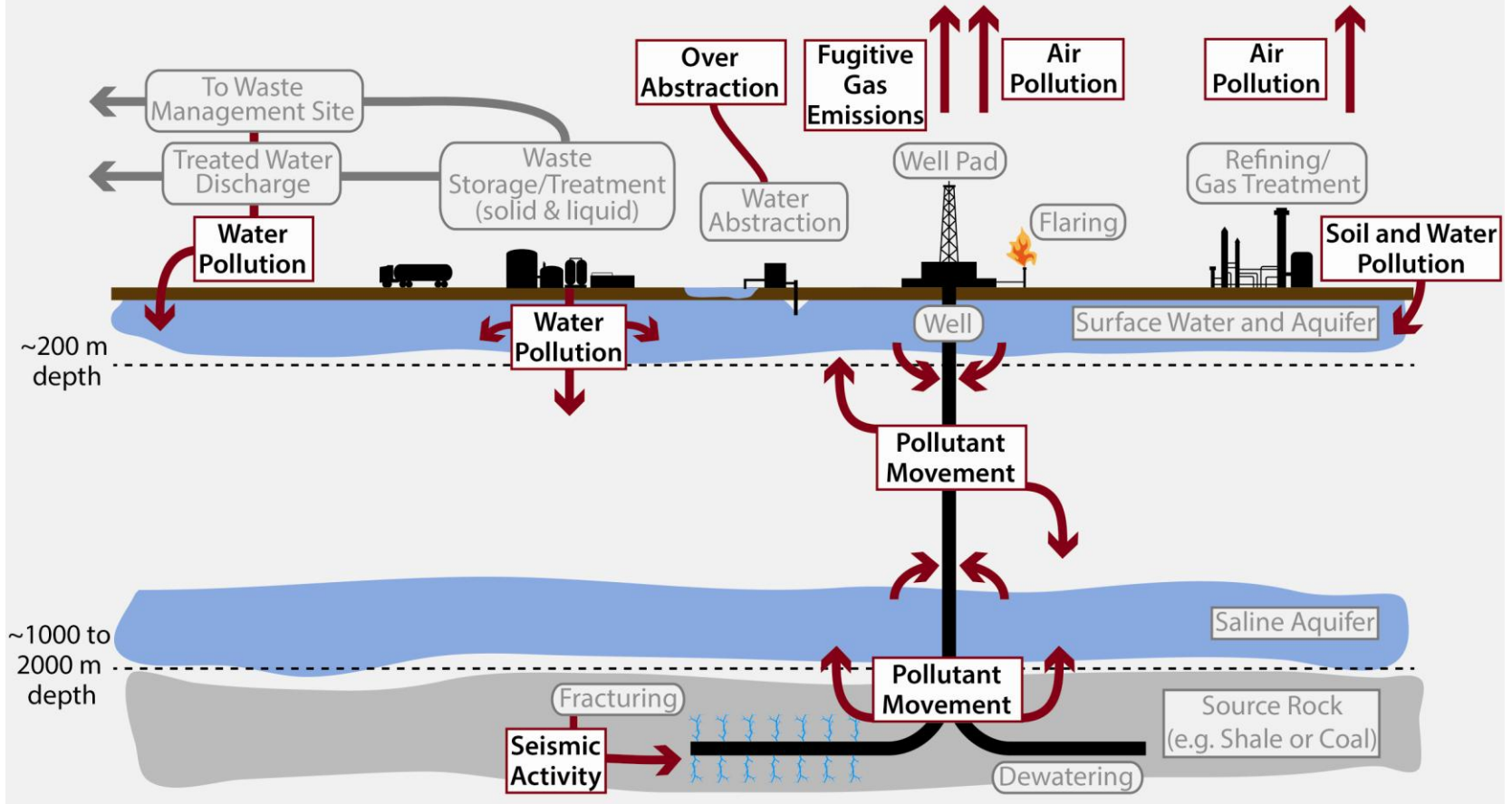
14th PEDL Round in Scotland



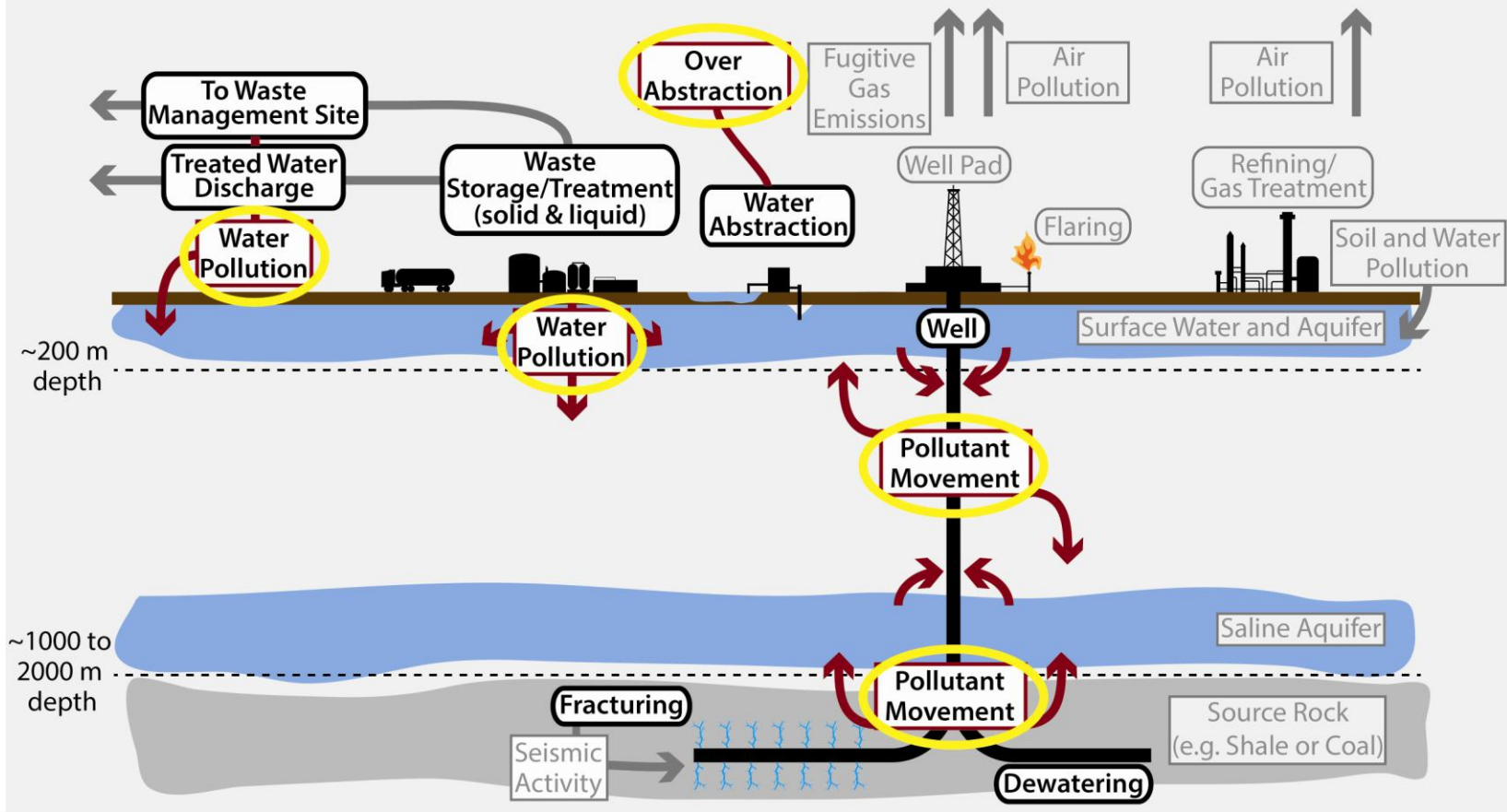
Coal Bed Methane and Shale Gas Activities



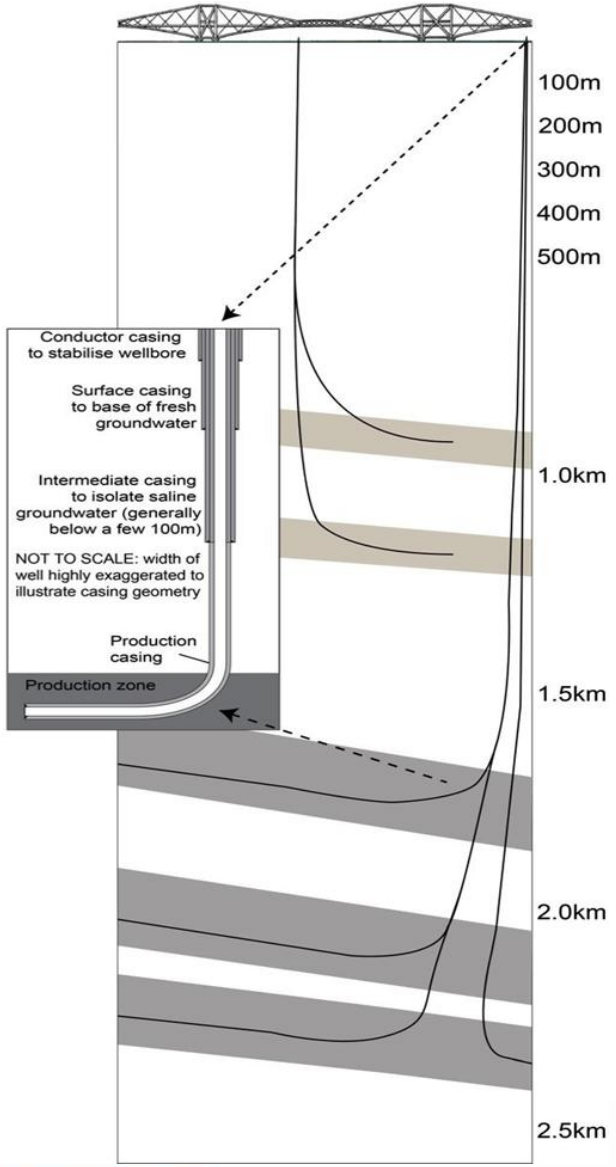
Coal Bed Methane and Shale Gas Potential Environmental Impacts



Water Environment (Controlled Activities) (Scotland) Regulations 2011 Via CAR Licence from SEPA



Well Construction



Well pad at production phase

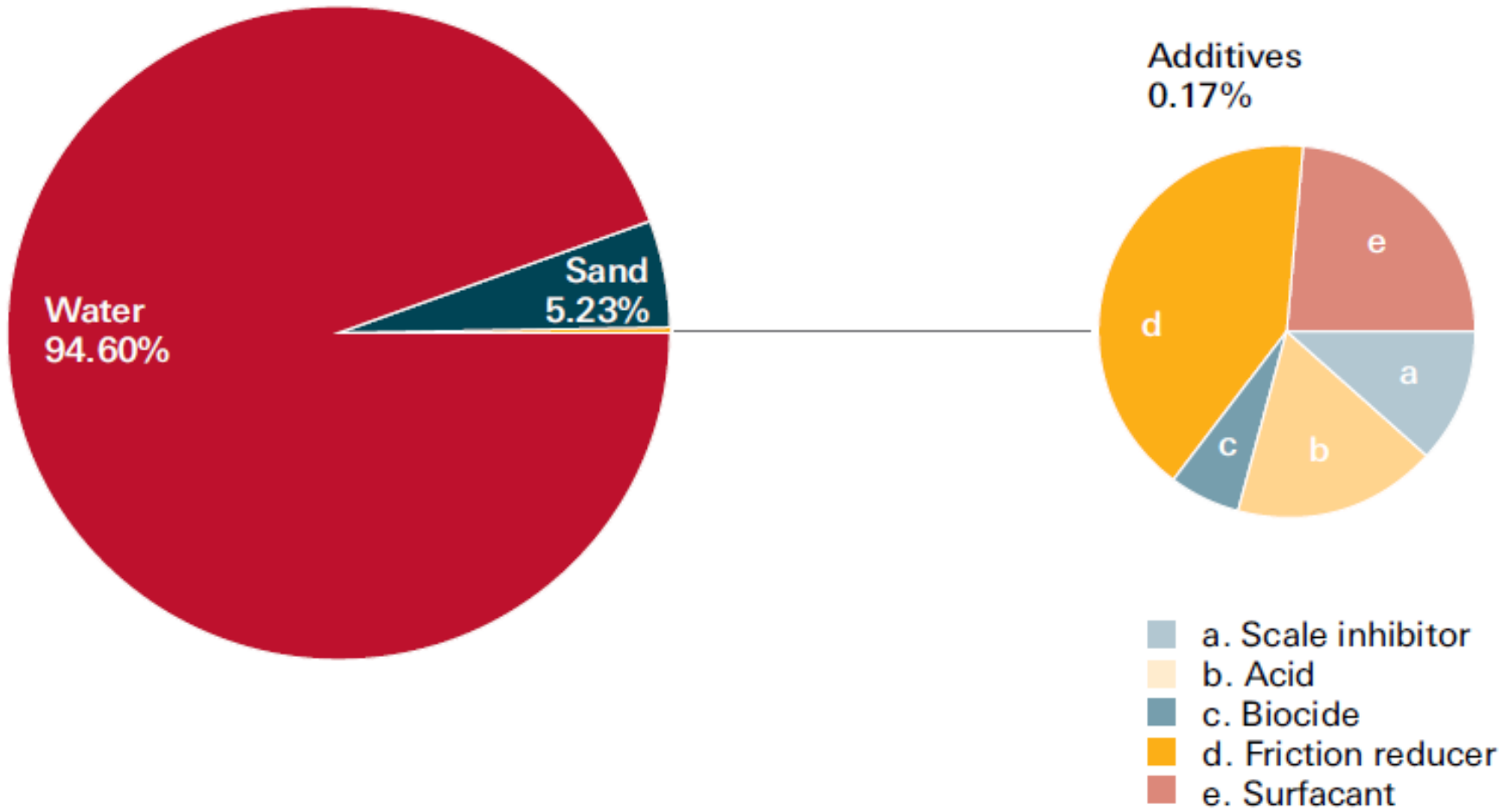


Millicentmedia.com 2015



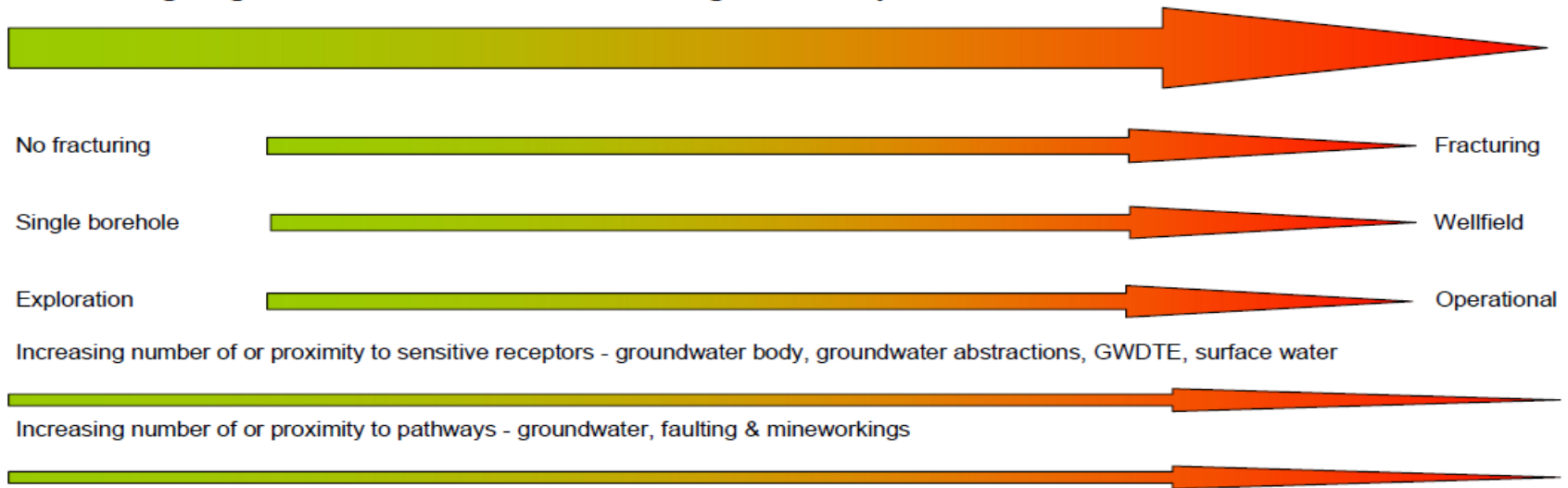
Ineos 2015

Typical Fracturing Fluid



Groundwater monitoring guidance - principles

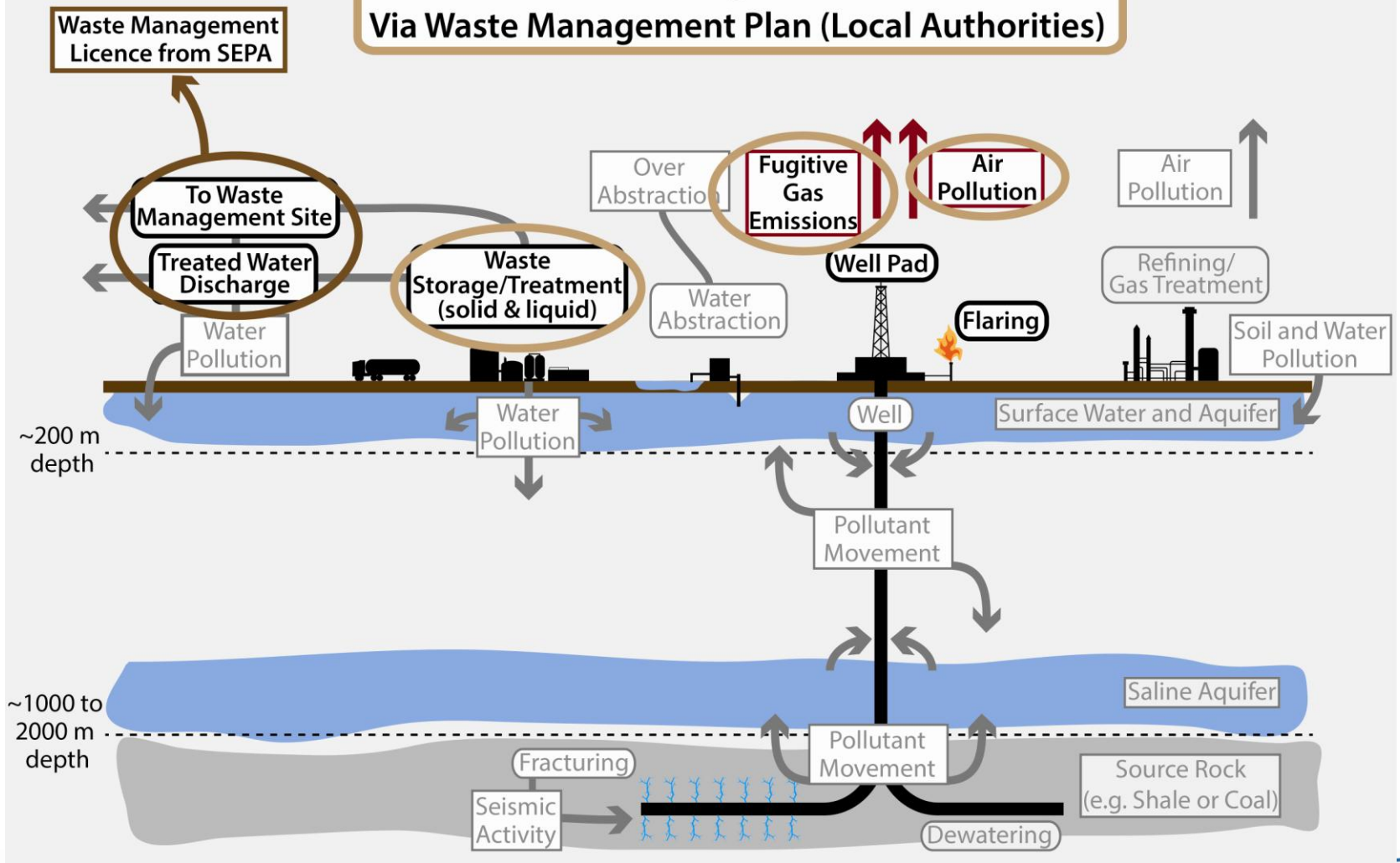
Increasing degree of risk of unconventional gas developments



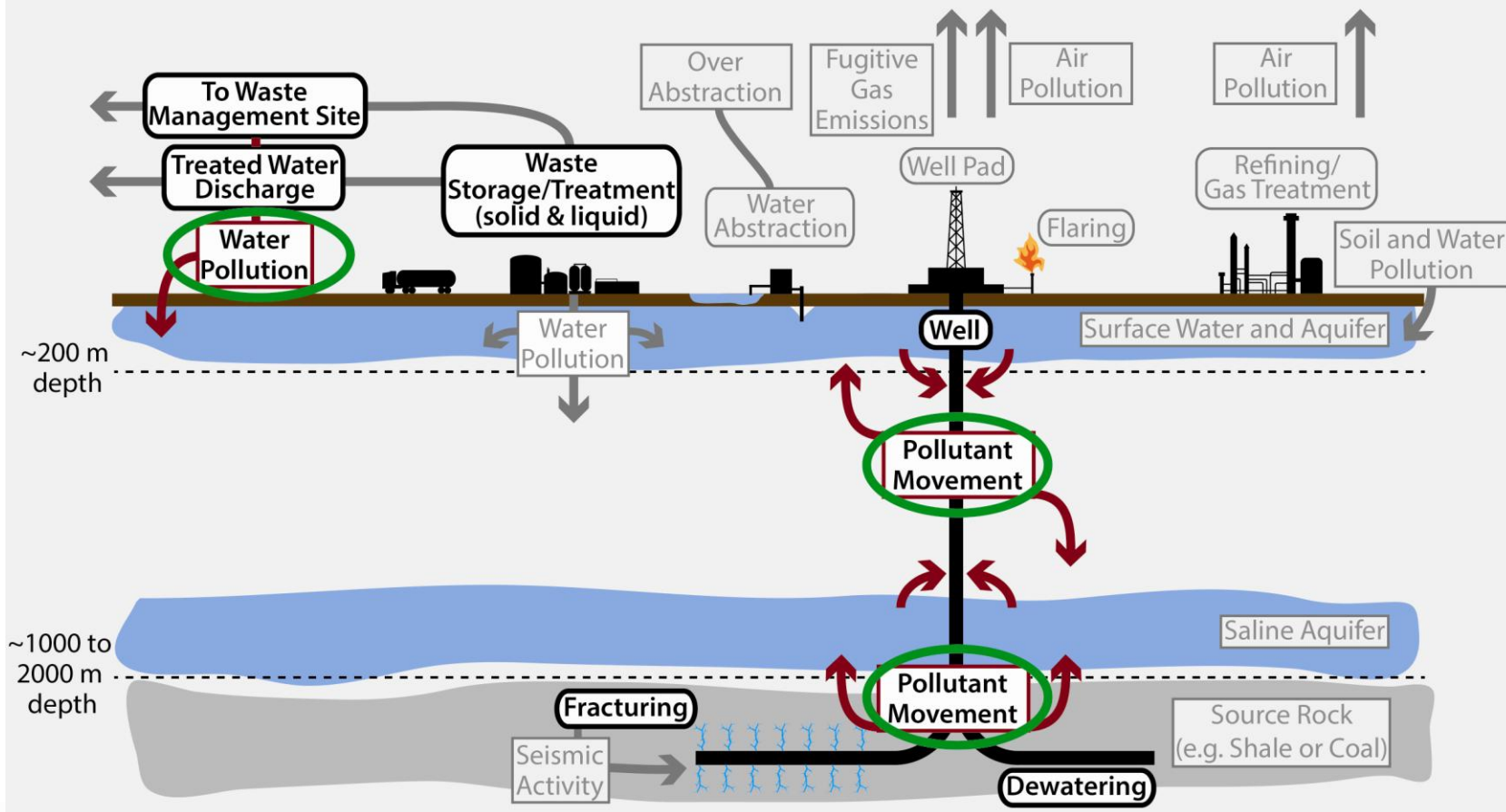
- Develop conceptual site model and identify potential sources, pathways and receptors
- Monitoring locations, parameters and frequencies should be linked to the risk posed to the water environment
- Baseline monitoring should be sufficient to characterise the natural variability of the groundwater system
- Ongoing monitoring and reporting changes against baseline

To be involved in the consultation please contact paul.butler@sepa.org.uk

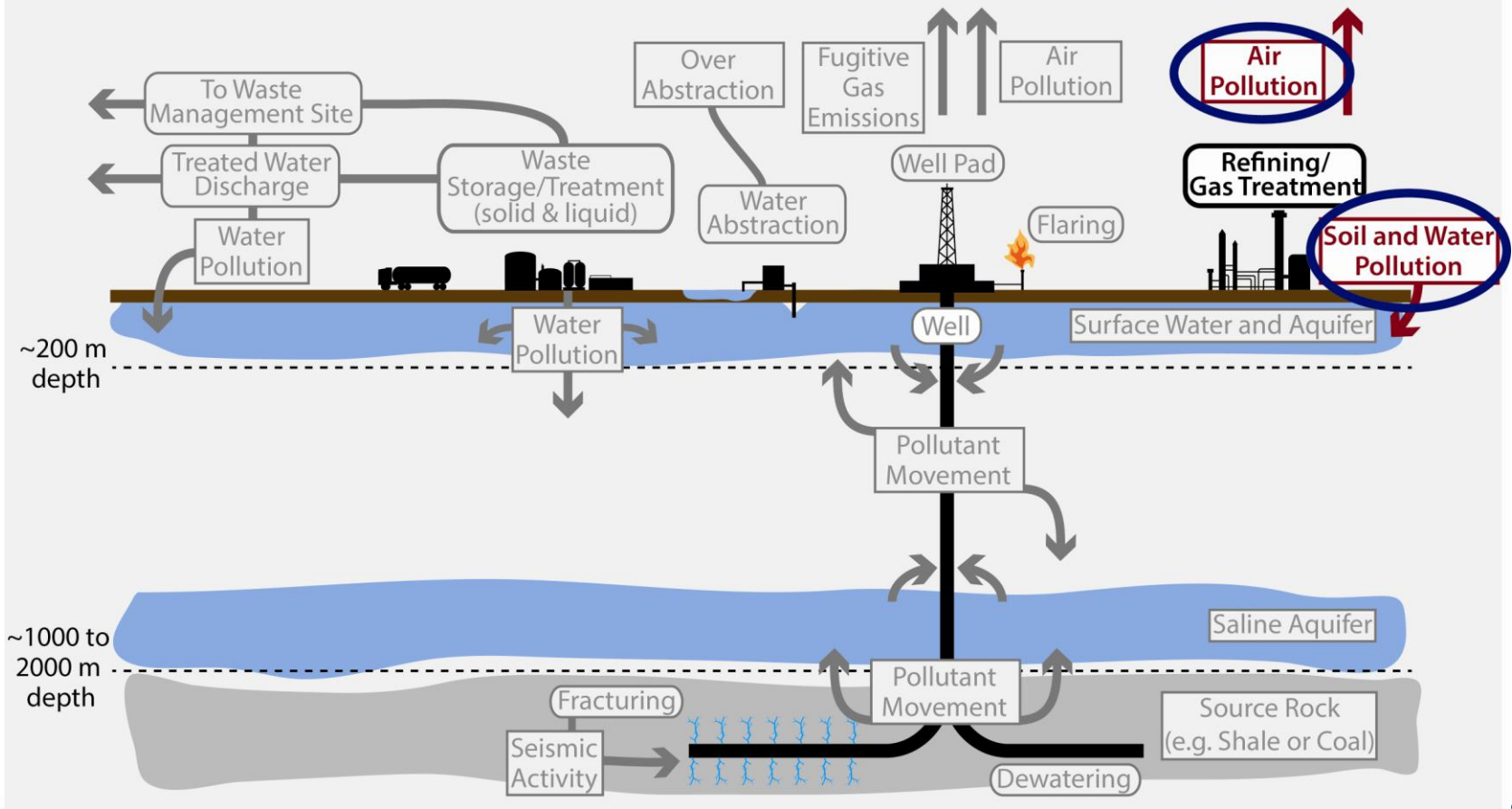
Management of Extractive Waste (Scotland) Regulations 2010 Via Waste Management Plan (Local Authorities)



Radioactive Substances Act (1993) Via RSA Permit from SEPA (only if NORM is present)



Pollution Prevention and Control (Scotland) Regulations 2012 Via PPC Permit from SEPA



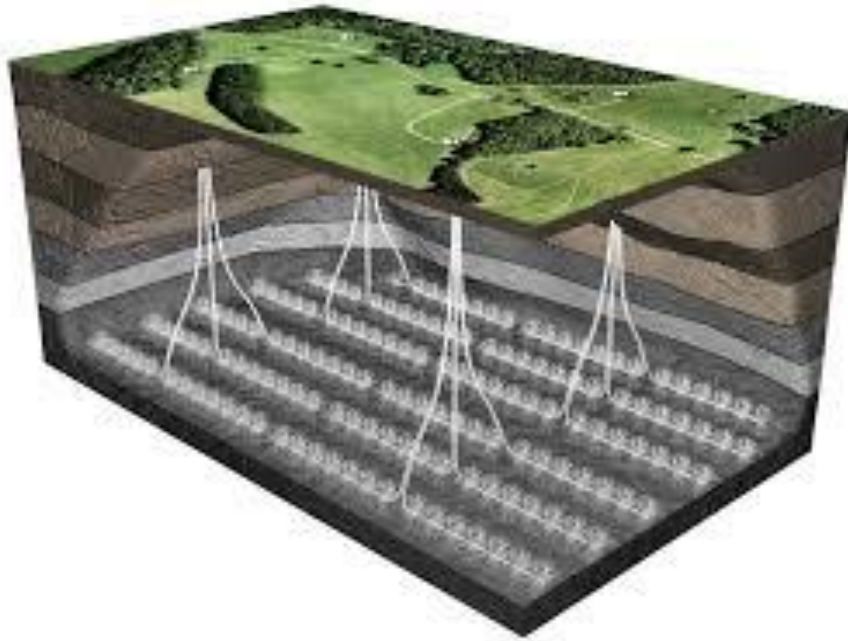
Regulatory Role for SEPA

- Water Environment (Controlled Activities)(Scotland) Regulations 2011 (CAR)
- Pollution Prevention and Control (Scotland) (PPC) 2012
- The Control of Major Accident Hazards Regulations 1999 (COMAH)
- Environmental Liability (Scotland) Regulations 2009 (ELR)
- NORM Radioactive Substances

Other potential environmental impacts and regulators:

Potential Impacts:	Other regulators:
Flaring	Dept of Energy and Climate Change (DECC)
Fugitive emissions of gas to air	Local Air Quality (local planning), indirectly HSE through borehole construction controls
Abandonment of wells	HSE through borehole construction controls
Climate Change	Scottish Government, local planning authority and SEPA Under the Climate Change (Scotland) Act 2009
Seismic Activity (from fracking only)	Local planning authority and DECC

Multi well cross section



Well distribution in USA



Local Authority Responsibilities

- The Management of Extractive Waste (Scotland) Regulations 2010
- Planning and Environmental Impact Assessment
- Local Air Quality Management (LAQM)

Include: Nitrogen dioxide, Particulate matter less than 10µm in diameter (PM10), Sulphur dioxide, Lead, Benzene, Carbon monoxide and 1,3 butadiene.

Other pollutants such as ozone, poly-aromatic hydrocarbons (PAHs), PM2.5 and various heavy metals are included in a wider air quality strategy.

Scottish Planning Policy

- Applicants should undertake a risk assessment for all proposals for shale gas and coal bed methane extraction.
- Consult local communities so that it can inform the design of the proposal.
- Local authority should consider buffer zones informed by the risk assessment
- Consider most efficient sequence of extraction

Expert Scientific Panel


Independent Expert Scientific Panel on Unconventional Oil and Gas,
published July 2014

Considered:

- Current Industry
- Potential in Scotland
- Technical Challenges
- Environmental and Societal Challenges
- Regulation and Legislative Background
- Public Awareness and Engagement



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Unconventional gas frequently asked questions

These frequently asked questions deal with shale gas and coal bed methane which are types of unconventional gas and the process of fracturing, also known as fracking.

What is fracturing?

Fracturing, or fracking, is a technique that uses fluid, usually water, pumped at high pressure into the rock to create narrow fractures which provide paths for the gas to flow into the well/borehole and for the gas to come to the surface.

Once the fractures have been created, small particles (usually of sand) are pumped into them to keep the fractures open. The water will also contain small quantities of other substances to improve the efficiency of the process, e.g. to reduce the amount of pressure required to fracture the rocks, to clean the water and to trace the flow of the fracturing fluid.

What is SEPA's regulatory role?

SEPA's role is to control the environmental impacts associated with the exploration and extraction of unconventional gas resources (eg. shale gas and coal bed methane), including the process of fracturing.

Through the [Water Environment \(Controlled Activities\) Regulations 2011](#) (known as CAR) we authorise the construction of the borehole, discharges of drilling or fracturing fluid to groundwater, or to surface water and abstractions, with the aim of preventing significant adverse impacts on the water environment. If the abstracted waters, sediments or scales contain naturally occurring radioactive materials above certain thresholds, then an authorisation is also required under the [Radioactive Substances Act \(1993\)](#).

Should the gas require further treatment, such as refining, then this activity may also fall within the [Pollution Prevention and Control \(Scotland\) 2012 \(PPC\)](#) regulations and, as such, additional regulatory controls would apply to the treatment activities. The PPC regulations are designed to control emissions to air, land and the water environment from certain specified activities.

SEPA is committed to delivering robust and proportionate regulation to this type of activity.

SEPA also has a duty to consider how Scotland can reduce the greenhouse gas emissions from regulated industry and businesses, under the [Climate Change \(Scotland\) Act 2009](#). As well as contributing to climate change, fugitive emissions have the potential to impact on human health and the environment. SEPA and the Local Authority will ensure that operators make full use of technologies that reduce fugitive emissions to air and undertake comprehensive monitoring during production to assess health risks.

Is anyone fracturing in Scotland?



Not currently. Fracturing occurred using just water and sand at Airth in the 1990s and has been used to develop drinking water supplies in the Highlands.

Does SEPA licence fracturing?

We do not have a remit to regulate the fracturing of rock and as such do not issue licences for fracturing.

Our regulatory role in relation to fracturing is to protect the water environment. Through the [Water Environment \(Controlled Activities\) Regulations 2011](#) (known as CAR) we would authorise the discharges of fracturing fluid to groundwater, or to

Version 121119

Regulatory guidance:
Coal bed methane and shale gas

Thank you for listening

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