

OPA

The oil and pipelines agency



Flooding, and its impact on pipelines and above ground installations

Stephen Humphrey
Pipeline Integrity Engineer
Government Pipeline and Storage System

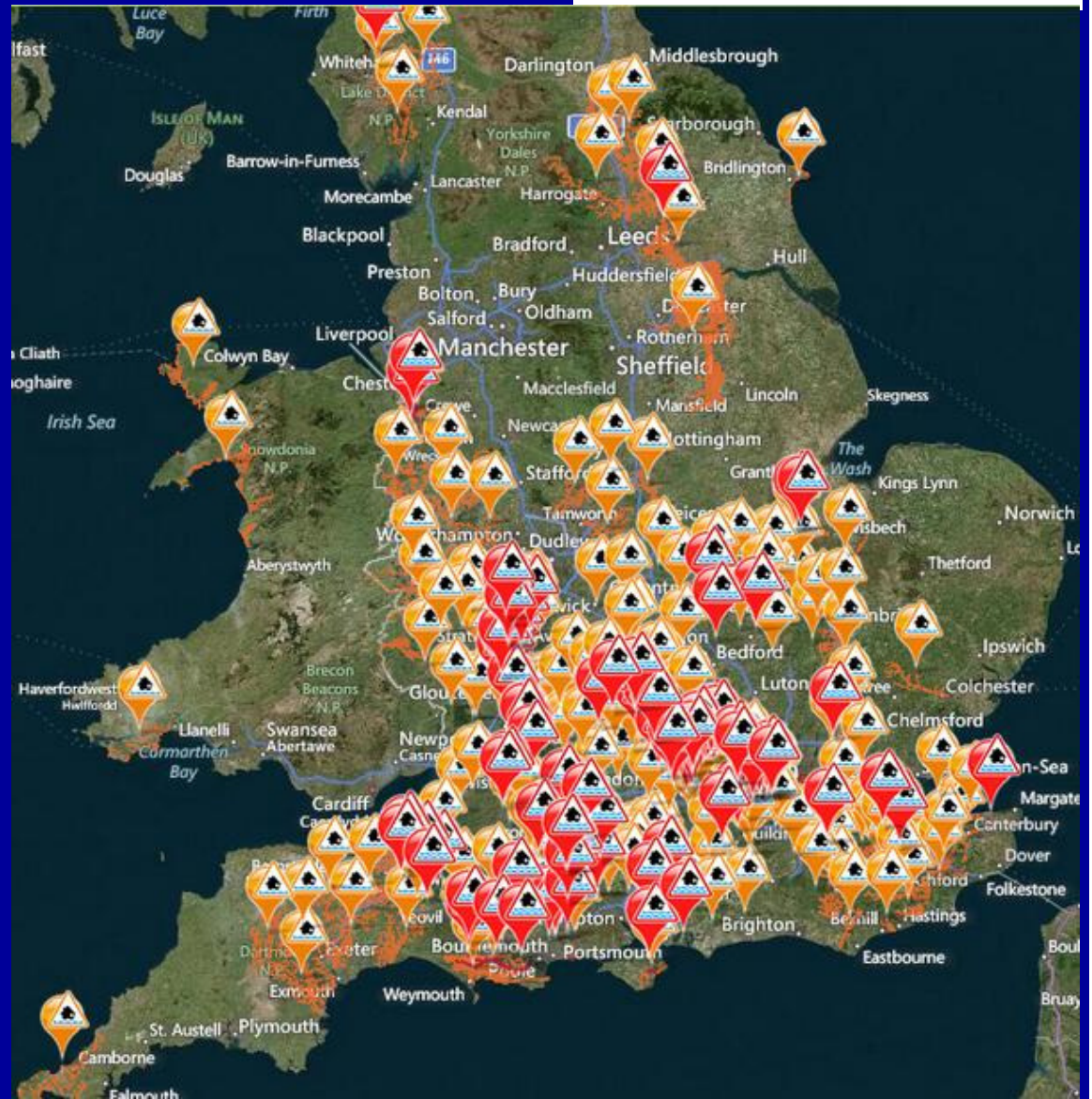
OPA

The oil and pipelines agency

UK Environment Agency
Flood Warning Map,
February 2014

Excel in Fuel Logistics

since 1963
concaawe
delivering science for Europe
COPEX 2014



OPA

The oil and pipelines agency



Background

The Oil And Pipelines Agency:

Operates and manages *The Government Pipeline and Storage System (GPSS)* in the UK

265 Underground Storage Tanks, with a total capacity of 1.4 million m³.

2,500km of Cross Country Pipelines

Transporting approximately 40% of the aviation fuel used in the UK.

Excel in Fuel Logistics

OPA

The oil and pipelines agency



Background

The GPSS:

Primarily built to service military requirements
(*RAF and NATO*).

Pipelines and storage sites form a ring-main around the UK, linking major import and refining facilities with strategic storage sites, and military and commercial end-users.

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014



Excel in Fuel Logistics

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe
COPEX 2014



Excel in Fuel Logistics

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe
COPEX 2014



Excel in Fuel Logistics

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014

What happens if you have an empty underground storage tank, and flooding raises the water table?

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014



Excel in Fuel Logistics

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014



Excel in Fuel Logistics

OPA

The oil and pipelines agency



Its not just tanks that are affected by flooding...

Excel in Fuel Logistics

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014



Excel in Fuel Logistics

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014



Excel in Fuel Logistics

OPA

The oil and pipelines agency



Assessing and managing Flood Risks

1. Define specific Flood Risk Warning Levels
2. Identify and understand the Flood Risk Receptors
3. Plan and implement risk reduction and mitigation actions linked to each Flood Risk Warning Level.

OPA

The oil and pipelines agency



Flood Risk Warning Levels

In England and Wales, the *Environment Agency* provides detailed Flood Risk Guidance to the public

- Flood Risk Zone Identification
- Flood Incident Mapping
- Flood Warnings

Additionally, the Met Office provides alerts and warnings for severe weather events

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014

The screenshot shows a web browser window displaying the Environment Agency's 'Flood' page. The browser's address bar shows the URL <http://www.environment-agency.gov.uk/homeandle>. The page features a navigation menu with links for 'Cymraeg', 'About us', 'Jobs', 'Contact us', 'Sitemap', and 'Help'. A search bar is located in the top right corner. The main content area is titled 'Flood' and is organized into several sections:

- Local flood information:** Includes a search box for 'Postcode, Town or River' and a 'Go' button.
- National flood information:** Lists links for 'Flood warnings summary', 'River and sea levels', 'Three-day flood risk forecast', and 'Live flood warnings map'. It also features icons for 'Met Office: Weather forecast', 'Highways Agency: Traffic information', and 'National Rail: Service disruptions'. A graphic with the text 'FLOODS DESTROY BE PREPARED' is visible.
- Prepare for flooding:** Lists actions such as 'Check your flood risk map for rivers and the sea', 'Check your flood risk map for surface water', 'Check your flood risk map for reservoirs', 'Sign up for flood warnings', 'Make a flood plan', and 'Prepare your property for flooding'.
- During a flood:** Lists 'What to do during a flood' and 'Get help during a flood'.
- After a flood:** Lists 'Clear up after a flood', 'Find temporary accommodation', 'What to tell your insurer after a flood', and 'Get help after a flood'.

On the right side of the page, there are additional sections:

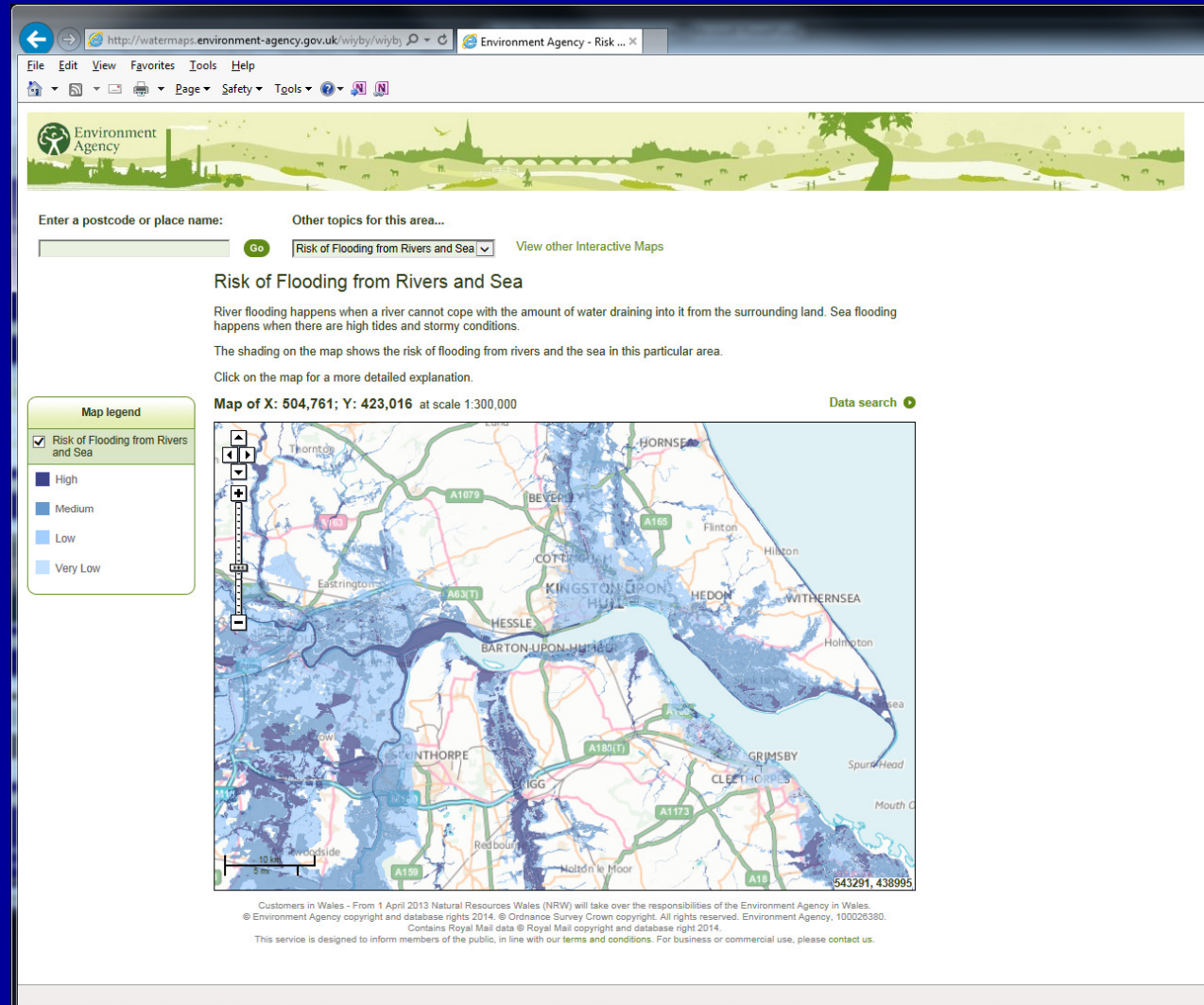
- Floodline:** Provides 'Flood warning information and advice' with contact numbers: 'Tel: 0345 988 1188' and 'Tel: 0845 988 1188'.
- Follow us:** Includes social media icons for Facebook, Flickr, Twitter, and YouTube.
- Join the discussion:** Features a house icon and the text 'Flood Group UK is a'.

Excel in Fuel Logistics

OPA

The oil and pipelines agency

- Identify GPSS sites that lie within a flood risk zone
 - overlay the site locations on the risk map.
- Prioritise sites according to risk level.

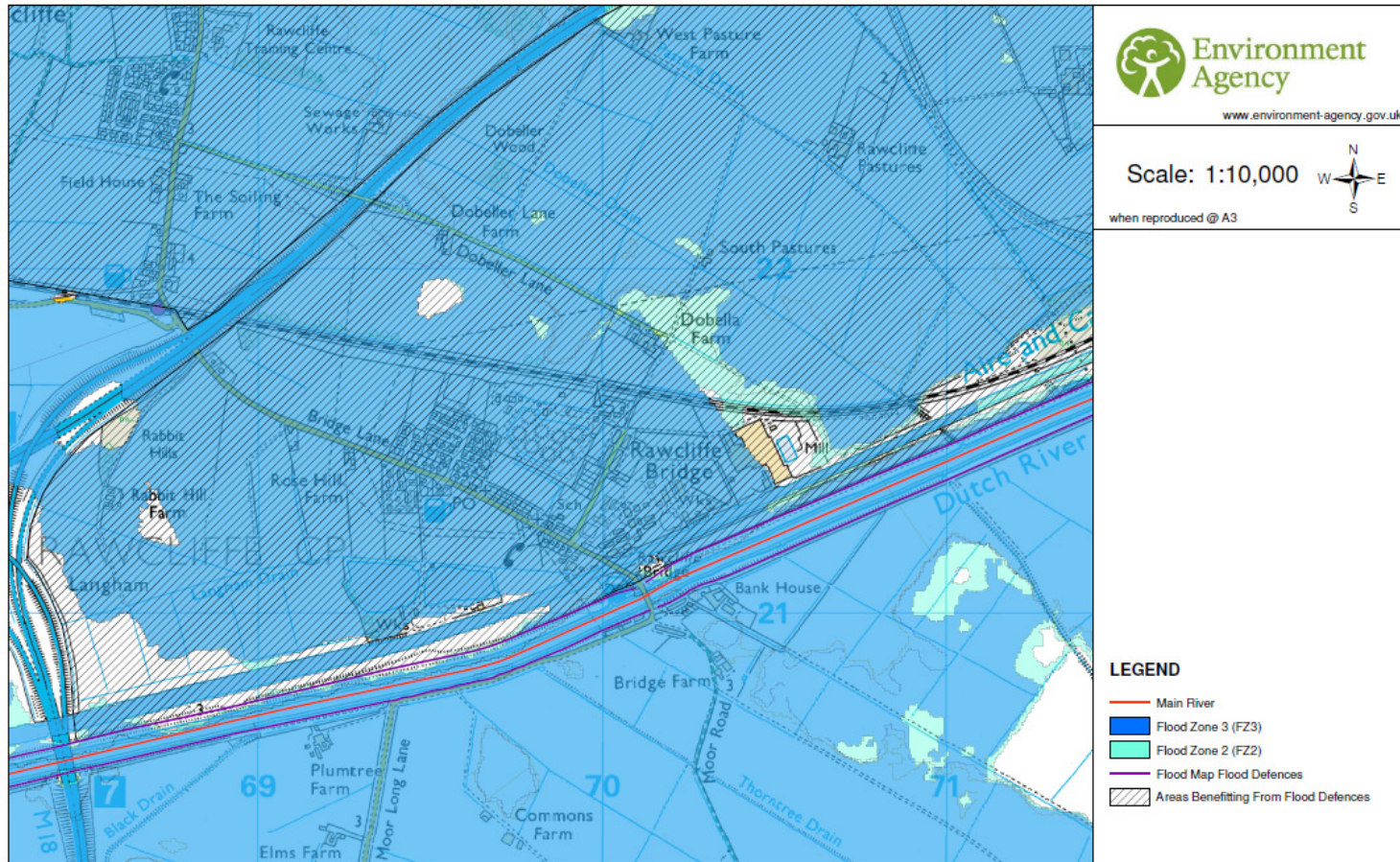


OPA

The oil and pipelines agency

COPEX 2014

Detailed FRA Map Centered on Rawcliffe Bridge - Date Created 23/03/2010 [Ref: 13599]



© Environment Agency copyright and / or database rights 2010. All rights reserved. © Crown Copyright and database right. All rights reserved. Environment Agency, 100026380, 2010.
Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

OPA

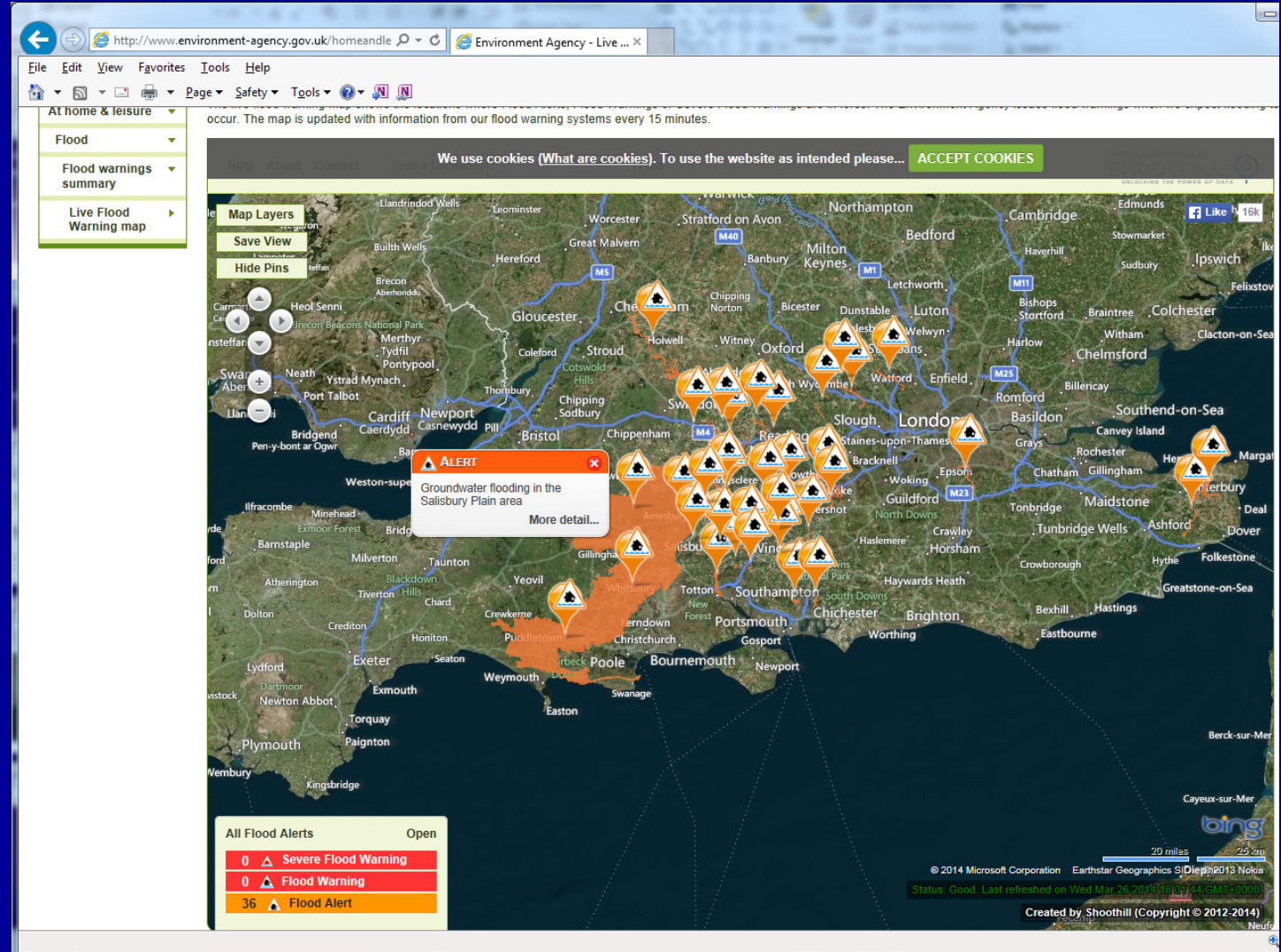
The oil and pipelines agency

During a flooding or severe weather event;

Controller receives automated text or email alerts.

Controller escalates the incident according to an approved plan.

Excel in Fuel Logistics



OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014

National Severe Weather Warnings - United Kingdom

Overview | Detail

Warnings overview: United Kingdom
Issued on Wed 26 Mar

Wed 26 Mar

Thu 27 Mar

Fri 28 Mar

Sat 29 Mar

Sun 30 Mar

Use the small maps above to select the weather warnings over the next five days. Click on your chosen region below for more details of current warnings in force.

United Kingdom	North West England
Orkney & Shetland	North East England
Highlands & Eilean Siar	Yorkshire & Humber
Grampian	West Midlands
Strathclyde	East Midlands
Central, Tayside & Fife	East of England
SW Scotland, Lothian Borders	South West England
Northern Ireland	London & South East England
Wales	

Key: Be aware Be prepared Take action Rain Wind Snow Ice Fog

The Met Office has responsibility for providing weather warnings for the UK. Coloured regions on the map show where severe weather warnings have been issued. When issued, the public are advised to take extra care. Further information and advice can be found on the: [Severe weather impact links](#) page.

Severe weather warnings

Share: 8+1

100%

Excel in Fuel Logistics

OPA

The oil and pipelines agency



Assessing and managing Flood Risks

1. Define specific Flood Risk Warning Levels
2. Identify and understand the Flood Risk Receptors
3. Implement risk reduction and mitigation actions linked to each Flood Risk Warning Level.

OPA

The oil and pipelines agency



Flood Risk Receptors

- Site Interceptors and drains
- Underground tanks, pumps, piping, and electrical equipment
- Buried and above-ground piping and equipment, subject to undermining, subsidence, floating, etc.
- Buildings
- Staff

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014



Excel in Fuel Logistics

OPA

The oil and pipelines agency



Assessing and managing Flood Risks

1. Define specific Flood Risk Warning Levels
2. Identify and understand the Flood Risk Receptors
3. Implement risk reduction and mitigation actions linked to each Flood Risk Warning Level.




OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014

Implement risk reduction and mitigation actions linked to each Flood Risk Warning Level

Alert Level	Description	Actions
1	EA Flood Alert;  Met Office Very Low or Low Weather Warning	Monitor the situation. Document actions in Incident Log.
2	Met Office Medium or High Weather Warning;  Flooding visible on site	Level 1 actions, plus; Check Interceptors. Prepare and deploy site-specific flood defences.
3	EA Severe Flood Warning 	Level 1 & 2 actions, plus; Cease operations. Evacuate site.

OPA

The oil and pipelines agency

since 1963
concaawe
delivering science for Europe

COPEX 2014

Flood Incident Closeout

Alert Level	Description	Actions
0	EA "Warning No Longer In Force" message Met Office "No Warnings Have Been Issued"	<p>If site was evacuated, check that site is safe prior to returning</p> <p>Check equipment, infrastructure & pipeline routes for damage</p> <p>Retrieve any deployed flood protection equipment, and check for damage</p> <p>Close Incident log</p> <p>Review and document lessons learned. Update Flood action plan as required.</p>

OPA

The oil and pipelines agency



Flooding, and its impact on pipelines and above ground installations

Stephen Humphrey
Pipeline Integrity Engineer
Government Pipeline and Storage System