

Appendix 3 INFORMATION ON COMAH DANGEROUS SUBSTANCES

This appendix lists the COMAH dangerous substances in use at the Bellanaboy Bridge Gas Terminal.

An analysis of the quantity and nature of the substances on the terminal (as part of the Classification as an Upper Tier COMAH Site Report, December 2013) indicates that the substances listed in Table 1 are those with hazards to people and / or the environment.

The name under IUPAC nomenclature relates to single substances and since the hazardous substances are generally mixtures, IUPAC names are not appropriate. Therefore, substances are identified by the IUPAC name where appropriate and otherwise by the common name. For all hazardous substances in Table 1, the CAS numbers of the constituents are provided.

The substance name, physical and toxicological characteristics are summarised in Table 1 and specific chemical characteristics are set out in Table 2.

The risk phases and hazard statements for the substances are set out in Table 3. The risk phases are defined in Table 4.

Table 1: COMAH Dangerous Substances – Summary Details

| Substance name | CAS # | Risk Phrase(s) | Inventory (tonne) | Physical characteristics <small>(Note 1)</small> | | Hazard to people | | Hazard to the environment <small>(Note 2)</small> | Toxicological /asphyxiation characteristics |
|---------------------------------------|------------------------|------------------|-------------------|---|--|--|---------------------------------|--|---|
| | | | | In containment | Under release / accident conditions | Immediate | Delayed <small>(Note 3)</small> | | |
| Acetylene | 74-86-2 | R12, R5, R6 | 0.39 | - Gas dissolved in a liquid medium for stability. | - Colourless gas. | <ul style="list-style-type: none"> - Extremely flammable gas. - Ignited releases may lead to one or more of the following: <ul style="list-style-type: none"> - jet fire, - flash fire, - vapour cloud explosions. - Heating may cause an explosion. - Explosive with or without contact with air. | N/A | N/A | N/A |
| Aeroshell Fluid 1, Aeroshell Fluid 41 | 64742-79-6 128-37-0 | R20, R38, R51/53 | 0.03 | N/A | <ul style="list-style-type: none"> - Red liquid. - Any released liquid would flow towards, and enter the drainage / catchment system. - Any liquid not retained by the on-site catchment system may travel off site and pose a threat to the aquatic environment. | <ul style="list-style-type: none"> - Harmful by inhalation. - Irritating to skin. | N/A | <ul style="list-style-type: none"> - Toxic to aquatic organisms. - LD50: 1-10 mg/l. - May cause long-term adverse effects in the aquatic environment. | N/A |

| Substance name | CAS # | Risk Phrase(s) | Inventory (tonne) | Physical characteristics ^(Note 1) | | Hazard to people | | Hazard to the environment ^(Note 2) | Toxicological /asphyxiation characteristics |
|---|---|----------------------------|--------------------------|--|---|---|---|--|---|
| | | | | In containment | Under release / accident conditions | Immediate | Delayed ^(Note 3) | | |
| Condensate Stabilised (Petroleum products) | 64741-47-5 | R12, R45, R46, R51/53, R65 | 711 | - Contained as liquid under atmospheric conditions within storage vessels and present in processing equipment under high pressure. | <ul style="list-style-type: none"> - Brown/straw coloured liquid. - Liquid released from atmospheric conditions forms a liquid pool. - Liquid released from high pressure processing equipment forms a liquid jet, from which droplets may rain out forming a pool. - Any released liquid would flow towards, and enter the drainage / catchment system. - Any liquid not retained by the on-site catchment system may travel off site and pose a threat to the aquatic environment. | <ul style="list-style-type: none"> - Extremely flammable liquid. - Ignited releases from the high pressure processing equipment would lead to a combination of jet and pool fires. - Ignited releases from the atmospheric storage vessels would lead to pool fires. | <ul style="list-style-type: none"> - Ingestion and /or prolonged exposure: - may cause cancer - may cause heritable genetic damage | <ul style="list-style-type: none"> - Toxic to aquatic organisms. - LD50: 1-10 mg/l. - May cause long-term adverse effects in the aquatic environment. | N/A |
| Corrosion Inhibitor KI-302C ^(Note 4) comprising: <ul style="list-style-type: none"> - 10-30% Sodium Nitrite (SN) - 1-5% Disodium Tetraborate Decahydrate (DSTD) | 7632-00-0 (SN) 1303-96-4 (DSTD) | R25, R36/38 | 0.06 ^(Note 4) | N/A | <ul style="list-style-type: none"> - Colourless to pale yellow liquid with no characteristic odour. | <ul style="list-style-type: none"> - Toxic if swallowed. | N/A | N/A | <ul style="list-style-type: none"> - Sodium nitrite. - LD50 85 mg/kg (ingestion, rat) ^(Note 5) |
| Corrosion Inhibitor Cortron CK352 ^(Note 4) comprising: <ul style="list-style-type: none"> - 25-60% Naphtha - 25-60% Organic Phosphate Ester (OPE) - <1% Naphthalene | 64742-94-5 (naphtha) CAS not present on SDS (OPE) ^(Note 6) 91-20-3 (naphthalene) | R38, R41, R51/53, R65, R67 | 3.94 ^(Note 4) | N/A | <ul style="list-style-type: none"> - Any released liquid would flow towards and enter the drainage / catchment system. - Any liquid not retained by the on-site catchment system may travel off site and pose a threat to the aquatic environment. | <ul style="list-style-type: none"> - Irritating to skin. - Risk of serious damage to eyes. - Harmful, may cause lung damage if swallowed. - Vapours may cause drowsiness and dizziness. | N/A | <ul style="list-style-type: none"> - Toxic to aquatic organisms. - LD50: 1-10 mg/l. - May cause long-term adverse effects in the aquatic environment. | N/A |

| Substance name | CAS # | Risk Phrase(s) | Inventory (tonne) | Physical characteristics ^(Note 1) | | Hazard to people | | Hazard to the environment ^(Note 2) | Toxicological /asphyxiation characteristics |
|-------------------------------|--|---|-------------------|--|---|--|--|---|---|
| | | | | In containment | Under release / accident conditions | Immediate | Delayed ^(Note 3) | | |
| Demulsifier | 95-63-9 64742-94-5 68425-60-5 78-83-1 91-20-3 | R10, R36/37/38, R52/53, R65 | 0.05 | N/A | - Dark brown liquid with an 'aromatic' odour. | - Flammable liquid. - Ignited releases would lead to pool fires. | N/A | - Harmful to aquatic organisms. - LD50: >10 mg/l. - May cause long-term adverse effects in the aquatic environment. | N/A |
| Diesel | 68334-30-5 | R40, R51/53, R65 | 78.6 | N/A | - Any released liquid would flow towards and enter the drainage / catchment system. - Any liquid not retained by the on-site catchment system may travel off site and pose a threat to the aquatic environment. | N/A | - Possible risk of irreversible effects. | - Toxic to aquatic organisms. - LD50: 1-10 mg/l. - May cause long-term adverse effects in the aquatic environment. | N/A |
| Diesel Biocide | 265-199-0 218-748-3 200-661-7 217-450-0 | R10, R20/21/22, R37, R41, R43, R65, R66, R50/53 | 0.05 | N/A | - Tan coloured liquid with an 'aromatic / solvent' odour. - Any released liquid would flow towards and enter the drainage / catchment system. - Any liquid not retained by the on-site catchment system may travel off site and pose a threat to the aquatic environment. | - Flammable liquid. - Ignited releases would lead to pool fires. | N/A | - Very toxic to aquatic organisms. - LD50: <1 mg/l. - May cause long-term adverse effects in the aquatic environment. | N/A |
| Hydrocarbon gas (Natural gas) | 68410-63-9 (comprising principally: methane 74-82-8 and ethane 74-84-0) | R12 | 48 | N/A | - Colourless and odourless gas. | - Extremely flammable gas. - Ignited releases may lead to one or more of the following: - jet fire, - flash fire, - vapour cloud explosions. | N/A | N/A | N/A |

| Substance name | CAS # | Risk Phrase(s) | Inventory (tonne) | Physical characteristics ^(Note 1) | | Hazard to people | | Hazard to the environment ^(Note 2) | Toxicological /asphyxiation characteristics |
|--|------------|------------------------------|-------------------|---|---|---|---|--|--|
| | | | | In containment | Under release / accident conditions | Immediate | Delayed ^(Note 3) | | |
| Unstabilised Condensate | 68919-39-1 | R12, R45, R46, R51/53, R65 | 48 | <ul style="list-style-type: none"> - Liquid containing dissolved light end hydrocarbons (methane, ethane etc). - Present in processing equipment under high pressure. | <ul style="list-style-type: none"> - Brown / straw coloured liquid. - Liquid released from high pressure processing equipment forms a liquid jet, from which droplets may rain out forming a pool. On release, the light end hydrocarbons 'flash off' leading to generation of flammable gas. - Any released liquid would flow towards and enter the drainage / catchment system. - Any liquid not retained by the on-site catchment system may travel off site and pose a threat to the aquatic environment. | <ul style="list-style-type: none"> - Extremely flammable liquid. - Ignited releases would lead to a combination of jet and pool fires. - Generation and dispersion of flammable gas may lead to a flash fire and /or vapour cloud explosion. | <ul style="list-style-type: none"> - Ingestion and /or prolonged exposure: <ul style="list-style-type: none"> - may cause cancer, - may cause heritable genetic damage. | <ul style="list-style-type: none"> - Toxic to aquatic organisms. - LD50: 1-10 mg/l. - May cause long-term adverse effects in the aquatic environment. | N/A |
| Hydrogen | 1333-74-0 | R12 | 0.005 | <ul style="list-style-type: none"> - Pressurised gas contained in cylinders. | <ul style="list-style-type: none"> - Colourless and odourless gas. | <ul style="list-style-type: none"> - Extremely flammable gas. - Ignited releases may lead to one or more of the following: <ul style="list-style-type: none"> - jet fire, - flash fire, - vapour cloud explosions. | N/A | | N/A |
| Methanol (Product) - 98% Aqueous Methanol | 67-56-1 | R11, R23/24/25, R39/23/24/25 | 787 | N/A | <ul style="list-style-type: none"> - Colourless liquid with a distinctive odour. - Releases form liquid pools from which vapour may be generated with subsequent dispersion. | <ul style="list-style-type: none"> - Toxic by inhalation, in contact with skin and if swallowed. | N/A | N/A | <ul style="list-style-type: none"> - LD50 5300 mg/kg (ingestion, rat). - LC50 83.8 mg/l (inhalation, rat, 4 hour) ^(Note 7). |

| Substance name | CAS # | Risk Phrase(s) | Inventory (tonne) | Physical characteristics ^(Note 1) | | Hazard to people | | Hazard to the environment ^(Note 2) | Toxicological /asphyxiation characteristics |
|---|--|------------------------------------|-------------------|--|---|--|-----------------------------|---|--|
| | | | | In containment | Under release / accident conditions | Immediate | Delayed ^(Note 3) | | |
| Methanol (Raw) - 40% Aqueous Methanol | 67-56-1 | R10, R23/24/25, R39/23/24/25 | 2563 | N/A | - Colourless liquid with a distinctive odour. - Releases form liquid pools from which vapour may be generated with subsequent dispersion. | - Toxic by inhalation, in contact with skin and if swallowed. | N/A | N/A | - LD50 5300 mg/kg (ingestion, rat). - LC50 83.8 mg/l (inhalation, rat, 4 hour) ^(Note 7) . |
| Nitrogen | 7727-37-9 | | 2.5 | N/A | - Colourless, odourless gas. | - May cause asphyxiation. | N/A | N/A | - 71% v/v ^(Note 8) . |
| Nytro Lyra X - Transformer Lubricant | 64742-53-6 72623-87-1 64742-55-8 64742-54-7 128-37-0 | R25 ^(Note 9) | 4 | N/A | - Light yellow liquid with a light petroleum odour. | - Toxic if swallowed ^(Note 9) . | N/A | N/A | - No data available ^(Note 9) . |
| Odorant comprising: 80%Tert Butyl Mercaptan, TBM (IUPAC 2-Methylpropane-2-thiol) 20% Dimethyl Sulphide, DMS (IUPAC Methylsulphanyl-methane) | 75-66-1 (TBM) 75-18-3 (DMS) | R11, R23, R36, R43, R65 | 9 | N/A | - Pale yellow liquid with a distinctive odour. - Releases form liquid pools from which vapour may be generated with subsequent dispersion. | - Toxic by inhalation. - Extremely flammable liquid. - Ignited releases would lead to pool fires. | N/A | N/A | - DMS LC50 0.17 mg/l (inhalation, rat, 4 hour) ^(Note 10) . - Mixture LC50 0.85 mg/l ^(Note 11) stabilised. |
| Oxygen Scavenger – Diethyl-hydroxylamine (DEHA) | 3710-84-7 | R10, R21,R22, R36/37/38 | 2 | N/A | - Yellowish liquid with an amine-like odour. | - Flammable liquid. - Ignited releases would lead to pool fires. | N/A | N/A | N/A |
| Propane | 74-98-6 | R12 | 0.47 | - Liquefied pressurised gas. | - Colourless and odourless gas. - Releases form aerosol jets from which droplets may 'rain out' and subsequently evaporate. | - Extremely flammable gas. - Ignited releases may lead to one or more of the following: - jet fire, - flash fire, - vapour cloud explosions. | N/A | N/A | N/A |

| Substance name | CAS # | Risk Phrase(s) | Inventory (tonne) | Physical characteristics ^(Note 1) | | Hazard to people | | Hazard to the environment ^(Note 2) | Toxicological /asphyxiation characteristics |
|--|---|------------------|-------------------|--|--|---|-----------------------------|---|---|
| | | | | In containment | Under release / accident conditions | Immediate | Delayed ^(Note 3) | | |
| Puraspec TM Absorbent 5158 comprising: - 25-35% Copper Sulphate (CS) - 25-35% Copper (II) Carbonate-Copper(II) Hydroxide [1:1] (CCCH) - <25% Hydrozincite - 10-15% Aluminium Oxide | 1317-40-4 (CS) 12069-69-1 (CCCH) 12122-17-7 (Hydrozincite) 1344-28-1 | R22, R50 | 15 | N/A | - Granular solid material. - Any release is unlikely to flow significant distances to drainage / catchment system. - Any material reaching drains and not retained by the on-site catchment system may travel off site and pose a threat to the aquatic environment. | - Harmful if swallowed. | N/A | - Very toxic to aquatic organisms. - LD50: <1 mg/l. | N/A |
| Shell Omala 100, 150, 220 - Lubricant comprising mineral oil and hazardous ingredient: 0.10-0.50% Amine Phosphate (AP) | 91745-46-9 (AP) | R43, R51/53 | 0.09 | N/A | - Any released liquid would flow towards and enter the drainage / catchment system. - Any liquid not retained by the on-site catchment system may travel off site and pose a threat to the aquatic environment. | - May cause sensitisation by skin contact. | N/A | - Toxic to aquatic organisms. - LD50: 1-10 mg/l. - May cause long-term adverse effects in the aquatic environment. | N/A |
| Sodium Hypochlorite Solution | 7681-52-9 | R34, R41, R50/53 | 0.5 | N/A | - Any released liquid would flow towards and enter the drainage / catchment system. - Any liquid not retained by the on-site catchment system may travel off site and pose a threat to the aquatic environment. | - Causes burns. - Risk of serious damage to eyes. | N/A | - Very toxic to aquatic organisms. - LD50: <1 mg/l. - May cause long-term adverse effects in the aquatic environment. | |
| Tectyl 502-C | 64742-48-9 64742-52-5 64742-54-7 64741-88-4 64742-52-5 | R10, R65, R66 | 0.02 | N/A | - Amber coloured liquid. | - Flammable liquid. - Ignited releases would lead to pool fires. | N/A | N/A | N/A |

Notes

1. The physical characteristics of some substances are different dependent on whether the substance is in containment or under accident conditions - where there is a difference, this is noted. Otherwise, the physical characteristics in containment are considered the same as under release conditions, and N/A (not applicable) is recorded in the 'In containment' column.
2. The 'Hazard to the Environment' information is provided only for those substances which possess dangerous for the environment risk phrases (R50, R51, R52, R53); all other substances are marked 'N/A'.
3. Delayed hazards are summarised for substances where there is a potential long term or chronic effect resulting from exposure, these are noted; for all other substances, N/A - not applicable, is noted.
4. The Classification as an Upper Tier COMAH site report provided information for the set of corrosion inhibitors. For the purposes of this table, information for both KI-302C and CK352 are presented separately as they individually represent the different hazards to people and the environment.
5. Toxicological data for sodium nitrite from the IUCLID datasheet (http://esis.jrc.ec.europa.eu/doc/IUCLID/data_sheets/7632000.pdf)
6. The Safety Data Sheet does not provide the CAS number for organic phosphate ester (OPE). The OPE does not contribute to the overall (COMAH relevant) risk phrases attributed (OPE has risk phrases R38 and R41). Therefore, for identification purposes, and in the absence of specific information, the provision of CAS numbers for the other main constituents (which contribute to the overall risk phrases) is deemed suitable and sufficient.
7. Toxicological data for methanol from the IUCLID datasheet (http://esis.jrc.ec.europa.eu/doc/IUCLID/data_sheets/67561.pdf). LC50 and LD50 values are for pure methanol, 100%.
8. A person exposed to oxygen levels below 6% v/v is likely to be fatally injured due to asphyxiation. Nitrogen levels above 71% v/v would result in <6% v/v oxygen concentration.
9. Substance conservatively classified as R25 (toxic if swallowed) on the basis of hazard statement 'May be fatal if swallowed and enters airways'. Therefore, no toxicity data are available.
10. Toxicological data for dimethyl sulphide from the IUCLID datasheet (http://esis.jrc.ec.europa.eu/doc/IUCLID/data_sheets/75183.pdf).
11. The dimethyl sulphide (DMS) component is very toxic by inhalation (R26). The LC50 (inhalation rat, 4 hour) for DMS is 0.17 mg/l. The toxicity of a mixture may be evaluated according to the formula in section 3.1.3.6.1 of the EU regulation for Classification Labelling and Packaging [CLP REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006] - in this case, the toxicity of mixture is the toxicity of the DMS divided by its proportion in the mixture. That is $0.17/0.2 = 0.85$ mg/l. Within the range $0.5 < LC50 < 2$ mg/l, the mixture is classified as R23 (toxic by inhalation). Therefore, on this basis the odorant mixture is classified as R23 (toxic by inhalation).

Table 2: COMAH Dangerous Substances – Chemical Characteristics

| Description | Chemical Characteristics | | | | | | | | Safety Data Sheet (SDS) source |
|--|--------------------------|--------------------|-----------------|--------------------------------|--------------------------------|-------------------------------|--------------------------------------|-----------------------------|--------------------------------|
| | Boiling point (°C) | Melting point (°C) | Density (kg/m³) | Lower Flammability Limit (v/v) | Upper Flammability Limit (v/v) | Autoignition temperature (°C) | Flash point (°C) ^(Note 1) | Vapour pressure | |
| Acetylene | -84.2 | -80.8 | 1.1 | 2.4% | 83% | 325 | -18 | 44 bar @ 20°C | SDS (Note 2) |
| Aeroshell Fluid 1,41 | >170 (initial) | < -60 (pour point) | 870 | 1% | 6% | >220 | 105 (typical) | 0.1 hPa (0.0001 bar) @ 20°C | SDS (Note 3) |
| Condensate stabilised (Petroleum products) | 35-350 | N/A | 700-870 | 0.6% | 8.7% | >200 | <0 | Data not available | SDS (Note 4) |
| Corrosion Inhibitor KI-302C ^(Note 5) comprising: - 10-30% Sodium Nitrite (SN) - 1-5% Disodium Tetraborate Decahydrate (DSTD) | 100 | -13 | 1148-1180 | Not flammable | Not flammable | Not flammable | Not flammable | 2.1 kPa @ 20°C | SDS (Note 6) |
| Corrosion Inhibitor Cortron CK352 ^(Note 5) comprising: - 25-60% Naphtha - 25-60% Organic Phosphate Ester (OPE) <1% Naphthalene | >155 | < -50 (pour point) | 915-945 | N/A | N/A | 320 | 65 (approx.) | 1 hPa (0.001 bar) @ 20° | SDS (Note 7) |
| Demulsifier | 108 | <-35 | 925-995 | N/A | N/A | N/A | 24 | 4.41 kPa @ 38°C | SDS (Note 8) |
| Diesel | | | | | | | | | SDS (Note 9) |
| Diesel Biocide | 115-180 | <-20 | 925 | N/A | N/A | N/A | 43 | N/A | SDS (Note 10) |
| Hydrocarbon gas (Natural gas) | -195 | N/A | 0.7 - 1.0 | 4% | 17% | 575-640 | -187 | N/A | SDS (Note 11) |
| Unstabilised Condensate | <35 ^(Note 12) | N/A | 700-870 | 0.6% | 8.7% | >200 | <0 | Data not available | SDS (Note 4) |
| Hydrogen | -259.2 | N/A | 0.08 | 4% | 75% | 560 | N/A | N/A | SDS (Note 13) |
| Methanol (Product) - 98% Aqueous Methanol | 64-65 | -98 | 790 | 6% | 36% | 455 | 11 | 130.3 hPa @ 20°C | SDS (Note 14) |

| Description | Chemical Characteristics | | | | | | | | Safety Data Sheet (SDS) source |
|--|--------------------------|--------------------------|---------------------------|--------------------------------|--------------------------------|-------------------------------|--------------------------------------|-------------------------------------|---|
| | Boiling point (°C) | Melting point (°C) | Density (kg/m³) | Lower Flammability Limit (v/v) | Upper Flammability Limit (v/v) | Autoignition temperature (°C) | Flash point (°C) ^(Note 1) | Vapour pressure | |
| Methanol (Raw) - 40% Aqueous Methanol | 80 ^(Note 15) | -38 ^(Note 15) | 926 ^(Note 15) | 6% | 36% | 455 | 29 ^(Note 15) | 97 mmHg | SDS (Note 14) for pure methanol, except where indicated |
| Nitrogen | -196 | -210 | 1.2 | Not flammable | Not flammable | Not flammable | Not flammable | N/A | SDS (Note 16) |
| Nynas Nytro Lyra X - Transformer lubricant | >250 | -60 | 870 | Not flammable | Not flammable | Not flammable | Not flammable | N/A | |
| Odorant comprising: 80%Tert Butyl Mercaptan, TBM (IUPAC 2-Methylpropane-2-thiol) 20% Dimethyl Sulphide, DMS (IUPAC Methyl-sulphanyl-methane) | 55 | -30 | 848 ^(Note 18) | 2.2% ^(Note 18) | 19.7% ^(Note 18) | 247 | -30 | 530 hPa @ 25°C ^(Note 18) | SDS (Note 17), except for where indicated, where information for DMS is presented |
| Oxygen Scavenger – Diethyl-hydroxylamine (DEHA) | 125-130 | -25 | 902 | N/A | N/A | N/A | N/A | 43 hPa @ 25°C | SDS (Note 19) |
| Propane | -40 | -187.6 | 500-510 | 1.7% | 10.9% | 450 | -104 | N/A | SDS (Note 20) |
| Puraspec TM Absorbent 5158 comprising: - 25-35% Copper Sulphate (CS) - 25-35% Copper (II) Carbonate-Copper(II) Hydroxide [1:1] (CCCH) - <25% Hydrozincite - 10-15% Aluminium Oxide | N/A | N/A | 800 - 1300 (bulk density) | N/A | N/A | N/A | N/A | N/A | SDS (Note 21) |
| Tectyl 502-C | >140 | <-20 | 870 | 0.6% | 7% | >200 | 40 | 0.21 kPa | SDS (Note 22) |

| Description | Chemical Characteristics | | | | | | | | Safety Data Sheet (SDS) source |
|--|--------------------------|--------------------|-----------------|--------------------------------|--------------------------------|-------------------------------|--------------------------------------|--------------------------|--------------------------------|
| | Boiling point (°C) | Melting point (°C) | Density (kg/m³) | Lower Flammability Limit (v/v) | Upper Flammability Limit (v/v) | Autoignition temperature (°C) | Flash point (°C) ^(Note 1) | Vapour pressure | |
| Shell Omala 100, 150, 220 - Lubricant comprising mineral oil and hazardous ingredient: 0.10-0.50% Amine Phosphate (AP) | >280 | -24 (pour point) | 891 | 1% | 10% | >320 | 240 | < 0.5 Pa | SDS (Note 23) |
| Sodium Hypochlorite Solution | 102 | -20 | 1220 - 1250 | N/A | N/A | N/A | N/A | 20 hPa (0.02 bar) @ 20°C | SDS (Note 24) |

Notes

1. Pensky-Martens closed cup method for flash point determination.
2. Air Products. Safety Data Sheet Acetylene. Version 1.19, revision date 26.07.2010. MSDS number 300000000002.
3. Shell UK Oil Products Limited. Safety Data Sheet Aeroshell 41. Version 3.0, effective date 14.06.2012. Ref. 000000000009.
4. Shell UK Exploration and Production. Safety Data Sheet Natural Gas Condensates (Sweet). Version 1.2, revision date 06.03.2012. Ref. 000000027193.
5. The COMAH notification provided information for the set of corrosion inhibitors. For the purposes of this table, information for both KI-302C and CK352 are presented separately as they individually represent the different hazards to people.
6. M-I Swaco. Safety Data Sheet Corrosion inhibitor KI-302C. Revision date 25.01.2010. SDS no. 11794.
7. Champion Technologies. Safety Data Sheet Cortron CK352. Revision Date 15/12/2008.
8. Baker Petrolite. Safety Data Sheet Demulsifier DMO80046. Revision date 18.07.2005.
9. EMO Oil Ireland. Safety Data Sheet Marked Gas Oil. August 2008.
10. M-I Production Chemicals. Safety Data Sheet Microbiocide MB-554. Revision date 22.08.2007. SDS no. 30267 - MB-554.
11. Shell UK Exploration and Production. Safety Data Sheet Natural Gas, dried. Version 1.0, revision date 21.11.2011. Ref. 000000026911.
12. Initial boiling point <35°C (due to presence of light end hydrocarbons).
13. Air Products. Safety Data Sheet Hydrogen. Version 1.19, revision date 24.07.2010. MSDS number 3000000000074.
14. Sigma Aldrich. Safety Data Sheet Methanol. Version 3.3, revision date 11.12.2008. SDS No. 32213. Note that a REACH compliant SDS is available (M-I Swaco. Safety Data Sheet Methanol. Date 08.08.2008. SDS number 11843) - the Sigma Aldrich SDS provides more relevant data and hence is used as the source.
15. The Methanol Institute Technical Information (<http://www.methanol.org/technical-information/resources.aspx>) - series of graphs presenting physical properties of methanol versus concentration in water. Properties taken from graphs, for 40% methanol.
16. Air Products. Safety Data Sheet Nitrogen. Version 1.3, revision date 16.07.2005. MSDS number 3000000000099.
17. Robinson Brothers. Safety Data Sheet Odorant NB. Revision No. 5, revision date 24.11.2005.
18. Physical properties for dimethyl sulphide from the IUCILID datasheet (http://esis.jrc.ec.europa.eu/doc/IUCILID/data_sheets/75183.pdf).
19. IMCD UK. Safety Data Sheet Trade name PENNSTOP DEHA 85%. Version 1, revision date 22.01.2008.
20. Shell UK Exploration and Production. Safety Data Sheet Propane. Version 1.0, revision date 16.05.2011.
21. Johnson Matthey Catalysts. Safety Data Sheet Puraspec 5158. Version 4, revision date 28/06/2012.

22. Valvoline Netherlands. Safety Data Sheet Tectyl 502C. Date 04.04.2006. Note that a REACH compliant SDS is available (Ashland. Safety Data Sheet Tectyl 502C. Date 22.10.2012. MSDS number R0517972) - the Valvoline SDS provides more relevant data and hence is used as the source.
23. Shell UK Oil Products Limited. Safety Data Sheet Shell Omala S2 G 100. Version 2.0, effective date 28.10.2011.
24. Shell UK Exploration and Production. Safety Data Sheet Sodium hypochlorite. Version 1.0, effective date 22.12.2011.

Table 3: Hazard Statements and Risk Phrases for the COMAH Dangerous Substances

| Description | Risk Phrase(s) | Hazard Statement (CLP Regulations) |
|---|--|--|
| Acetylene | R12, R5, R6 | H220, H240, EUH006 |
| Aeroshell Fluid 1, 41 | R20, R38, R51/53 | H332, H315, H411 |
| Shell Omala 100, 150, 220 - Lubricant | R43, R51/53 | H317, H411 |
| Condensate stabilised (Petroleum products) | R12, R45, R46, R51/53, R65 | H220, H350, H340, H411, H304 |
| Corrosion Inhibitor (Corroless, Cortron CK352, KI-302C) | R25, R36/38, R38, R41, R51/53, R65, R67, R20/21/22 | H301, H319, H315, H411, H304, H336, H332, H312 |
| Demulsifier | R10, R36/37/38, R52/53, R65 | H226, H319, H335, H315, H412, H304 |
| Diesel | R40, R51/53, R65 | H351, H411, H304 |
| Diesel Biocide | R10, R20/21/22, R37, R41, R43, R65, R66, R50/53 | H226, H332, H312, H302, H335, H318, H317, H304, EUH066, H400, H410 |
| Hydrocarbon gas (Natural gas) | R12 | H220 |
| Unstabilised Condensate | R12, R45, R46, R51/53, R65 | H220, H350, H340, H411, H304 |
| Hydrogen | R12 | H220 |
| Methanol (Raw) (40% aqueous methanol) | R10, R23/24/25, R39/23/24/25 | H225, H331, H301, H370 |
| Nytro Lyra X - Transformer lubricant | R25 | H301 |
| Odorant (80% Tert Butyl Mercaptan, TBM, 20% Dimethyl sulphide, DMS) | R11, R23, R36, R43, R65 | H225, H331, H319, H317, H304 |
| Oxygen Scavenger – Diethyl-hydroxylamine (DEHA) | R10, R21, R22, R36/37/38 | H226, H312, H302, H319, H335, H315 |
| Propane | R12 | H220 |
| Puraspec Absorbent 5158 | R22, R50 | H302, H400 |
| Sodium Hypochlorite Solution | R34, R41, R50/53 | H314, H318, H400, H401 |
| Tectyl 502-C | R10, R65, R66 | H226, H304, EUH066 |

Table 4: Risk Phrases

| Risk Phrases |
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| R1 - Explosive when dry |
| R2 - Risk of explosion by shock, friction, fire or other sources of ignition |
| R3 - Extreme risk of explosion by shock, friction, fire or other sources of ignition |
| R4 - Forms very sensitive explosive metallic compounds |
| R5 - Heating may cause an explosion |
| R6 - Explosive with or without contact with air |
| R7 - May cause fire |
| R8 - Contact with combustible material may cause fire |
| R9 - Explosive when mixed with combustible material |
| R10 - Flammable |
| R11 - Highly flammable |
| R12 - Extremely flammable |
| R14 - Reacts violently with water |
| R15 - Contact with water liberates extremely flammable gases |
| R16 - Explosive when mixed with oxidizing substances |
| R17 - Spontaneously flammable in air |
| R18 - In use, may form flammable/explosive vapour-air mixture |
| R19 - May form explosive peroxides |
| R20 - Harmful by inhalation |
| R21 - Harmful in contact with skin |
| R22 - Harmful if swallowed |
| R23 - Toxic by inhalation |
| R24 - Toxic in contact with skin |
| R25 - Toxic if swallowed |
| R26 - Very toxic by inhalation |
| R27 - Very toxic in contact with skin |
| R28 - Very toxic if swallowed |
| R29 - Contact with water liberates toxic gas |
| R30 - Can become highly flammable in use |
| R31 - Contact with acids liberates toxic gas |
| R32 - Contact with acids liberates very toxic gas |
| R33 - Danger of cumulative effects |
| R34 - Causes burns |
| R35 - Causes severe burns |
| R36 - Irritating to eyes |
| R37 - Irritating to respiratory system |
| R38 - Irritating to skin |
| R39 - Danger of very serious irreversible effects |
| R40 - Limited evidence of a carcinogenic effect |

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| R41 - Risk of serious damage to eyes |
| R42 - May cause sensitization by inhalation |
| R43 - May cause sensitisation by skin contact |
| R44 - Risk of explosion if heated under confinement |
| R45 - May cause cancer |
| R46 - May cause heritable genetic damage |
| R48 - Danger of serious damage to health by prolonged exposure |
| R49 - May cause cancer by inhalation |
| R50 - Very toxic to aquatic organisms |
| R51 - Toxic to aquatic organisms |
| R52 - Harmful to aquatic organisms |
| R53 - May cause long-term adverse effects in the aquatic environment |
| R54 - Toxic to flora |
| R55 - Toxic to fauna |
| R56 - Toxic to soil organisms |
| R57 - Toxic to bees |
| R58 - May cause long-term adverse effects in the environment |
| R59 - Dangerous for the ozone layer |
| R60 - May impair fertility |
| R61 - May cause harm to the unborn child |
| R62 - Possible risk of impaired fertility |
| R63 - Possible risk of harm to the unborn child |
| R64 - May cause harm to breastfed babies |
| R65 - Harmful: may cause lung damage if swallowed |
| R66 - Repeated exposure may cause skin dryness or cracking |
| R67 - Vapours may cause drowsiness and dizziness |
| R68 - Possible risk of irreversible effects |
| R 14/15 - Reacts violently with water, liberating extremely flammable gases |
| R 15/29 - Contact with water liberates toxic, extremely flammable gas |
| R 20/21 - Harmful by inhalation and in contact with skin |
| R 20/22 - Harmful by inhalation and if swallowed |
| R 21/22 - Harmful in contact with skin and if swallowed |
| R 20/21/22 - Harmful by inhalation, in contact with skin and if swallowed |
| R 23/24 - Toxic by inhalation and in contact with skin |
| R 24/25 - Toxic in contact with skin and if swallowed |
| R 23/25 - Toxic by inhalation and if swallowed |
| R 23/24/25 - Toxic by inhalation, in contact with skin and if swallowed |
| R 26/27 - Very toxic by inhalation and in contact with skin |
| R 26/28 - Very toxic by inhalation and if swallowed |
| R 26/27/28 - Very toxic by inhalation, in contact with skin and if swallowed |
| R 27/28 - Very toxic in contact with skin and if swallowed |
| R 36/37 - Irritating to eyes and respiratory system |
| R 36/38 - Irritating to eyes and skin |

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| R 37/38 - Irritating to respiratory system and skin |
| R 36/387/38 - Irritating to eyes, respiratory system and skin |
| R 39/23 - Toxic: danger of very serious irreversible effects through inhalation |
| R 39/24 - Toxic: danger of very serious irreversible effects in contact with skin |
| R 39/25 - Toxic: danger of very serious irreversible effects if swallowed |
| R 39/32/24 - Toxic: danger of very serious irreversible effects through inhalation and in contact with skin |
| R 39/23/25 - Toxic: danger of very serious irreversible effects through inhalation and if swallowed |
| R 39/24/25 - Toxic: danger of very serious irreversible effects in contact with skin and if swallowed |
| R 39/23/24/25 - Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed |
| R 39/26 - Very toxic: danger of very serious irreversible effects through inhalation |
| R 39/26/27 - Very toxic: danger of very serious irreversible effects through inhalation and in contact with skin |
| R 39/27 - Very toxic: danger of very serious irreversible effects in contact with skin |
| R 39/28 - Very toxic: danger of very serious irreversible effects if swallowed |
| R 39/26/28 - Very toxic: danger of very serious irreversible effects through inhalation and if swallowed |
| R 39/27/28 - Very toxic: danger of very serious irreversible effects in contact with skin and if swallowed |
| R 39/26/27/28 - Very toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed |
| R 68/20 - Harmful: possible risk of irreversible effects through inhalation |
| R 68/21 - Harmful: possible risk of irreversible effects in contact with skin |
| R 68/22 - Harmful: possible risk of irreversible effects if swallowed |
| R 68/20/21 - Harmful: possible risk of irreversible effects through inhalation and in contact with skin |
| R 68/20/22 - Harmful: possible risk of irreversible effects through inhalation and if swallowed |
| R 68/21/22 - Harmful: possible risk of irreversible effects in contact with skin and if swallowed |
| R 68/20/21/22 - Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed |
| R 42/43 - May cause sensitization by inhalation and skin contact |
| R 48/20 - Harmful: danger of serious damage to health by prolonged exposure through inhalation |
| R 48/21 - Harmful: danger of serious damage to health by prolonged exposure in contact with skin |
| R 48/22 - Harmful: danger of serious damage to health by prolonged exposure if swallowed |
| R 48/20/21 - Harmful: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin |
| R 48/20/22 - Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed |
| R 48/21/22 - Harmful: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed |
| R 48/20/21/22 - Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed |
| R 48/23 - Toxic: danger of serious damage to health by prolonged exposure through inhalation |
| R 48/24 - Toxic: danger of serious damage to health by prolonged exposure in contact with skin |
| R 48/25 - Toxic: danger of serious damage to health by prolonged exposure if swallowed |
| R 48/23/24 - Toxic: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin |
| R 48/23/25 - Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed |
| R 48/24/25 - Toxic: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed |

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| R 48/23/24/25 - Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed |
| R 50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment |
| R 51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment |
| R 52/53 - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment |