



## IADC HEALTH SAFETY AND ENVIRONMENTAL COMMITTEE ENVIRONMENTAL DATA GUIDELINES

**Mission Statement:** These guidelines have been developed by the IADC HSE Committee as a methodology for drilling contractors to consistently track and internally report environmental performance in a uniform manner.

**Drilling Contractors are encouraged to follow these guidelines as closely as possible.**

### 1. INTRODUCTION

Four categories of data collection have been established to give a representative view of performance. They are:

- Loss of Primary Containment Reporting
- Loss of Primary Containment Causes
- Energy Consumption
- Atmospheric Emissions Due to Energy Use

For purposes of this data gathering program the following are NOT included:

- Flaring
- Well control emissions
- Vapors originating from mud systems, including cuttings treatment systems;
- Operational discharge of drill cuttings;
- Releases from third party personnel not under the control of the drilling contractor;
- Other releases that are under the control of the operator.

This Guide describes the agreed reporting format for data collection, **however it is not mandatory.**

### 2. DEFINITIONS:

**Active Rig Day (ARD):** Any day that a rig is in operation (engines running).

**Annual Energy Consumption:** Is the total volume of energy consumed converted into equivalent barrels of diesel oil.

**Atmospheric Emissions Due to Energy Consumption:** Are the total of each of the following emissions that are released due to operations: CH<sub>4</sub>(t), NMVOC(t), SO<sub>2</sub>(t), NO<sub>x</sub>(t), CO<sub>2</sub>(t), and CO(t). (See paragraph 3.2.9)

(t) = US Tons (2,000 pounds).

**Barrel:** For purposes of this guidance document the volume of a barrel is 42 US gallons.

**Drilling** activities, including exploratory and appraisal wells, well testing, re-drilling and well servicing/workover of wells.

**Energy Used Per Active Rig Day (ARD):** Is the total volume of energy consumed in barrels divided by the number of active rig days.

**Environmentally sensitive** area is defined as: Any area designated as special (defined by MARPOL) or an environmentally protected area defined by treaties, protocols, conventions, or local regulations/laws. Releases



to environmentally sensitive areas not specifically allowed by permit shall automatically result in the incident being classified as a Level 4 severity.

**Hazardous Material** is defined as: a solid, liquid, or vapor (gas) that when released into the environment could cause illness, injury, or death to people or destruction of the environment if improperly treated, stored, transported, or discarded. Substances are considered hazardous if they are **ignitable** (capable of burning or causing a fire), **corrosive** (able to corrode steel or harm organisms because of extreme acidic or alkylne properties), **reactive** (able to explode or produce toxic gases), or **toxic** (containing substances that are poisonous). Mixtures, residues, or materials containing hazardous wastes are also considered hazardous materials.

**Loss of Primary Containment** is any **non-planned** discharge of hazardous or non-hazardous material that gets outside its primary containment or from area of intended use. (For example a loss of primary containment from an engine would be if a fuel or oil filter or the oil pan failed and oil or fuel was leaked to the catch pan.)

**Number of Events per Active Rig Day (ARD):** Is the total number of environmental events divided by the total number of active rig days.

**Offshore** refers to operations that take place at sea, including inland seas directly connecting to oceans. Operations in bays, in major inland seas, e.g. the Caspian Sea, or in other inland seas directly connected to oceans are counted as offshore.

**Onshore** refers to operations that take place within a landmass, including those on swamps, rivers and lakes. In some regulatory regions, activities taking place at sea may be controlled via an onshore permit. Here data should be reported as arising from ONSHORE activities.

**Release:** Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, diverting, injecting, escaping, leaching, dumping, or disposing into the environment of a non-hazardous or toxic chemical or extremely hazardous substance.

#### **Spills:**

**Regulatory Reportable Spills** are spills that are released overboard from an offshore vessel or leave the containment of land rigs that have exceeded reportable quantities per applicable regulations.

**Non-Regulatory Reportable Spills:** Are spills that are not required to be reported per applicable regulations. Such spills may include: Spills that do not exceed reportable quantities, spills on offshore rigs that leave the primary containment but do not leave the confines of the vessel, and spills that remain within the containment on land rigs.

**Reportable Spill per IADC Environmental Reporting Guidelines:** An incident contained onboard or within site containment system(s) is reportable under this program when one or more of the following conditions are met:

- **Non-Hazardous Material Release:** A quantity of 21 gallons (74.49 liters) or more of non-hazardous materials not retained in secondary containment systems.  
**Example:** a spill of produced brine water on the deck of a vessel which is contained and cleaned up in situ. Land Example: Transfer of water based mud with an overflow of a trip tank and did not get off location.
- **Hazardous Material Release:** A quantity of hazardous material greater than the reportable quantity per regulatory requirements that is not retained in secondary containment systems (Regulatory Reportable Spill).  
**EXAMPLE:** a spill of 1,050 gallons (25 bbls) of oil base mud lost during transfer operations.



- Any environmental spill causing an IADC ASP Recordable injury or illness to personnel should be reported as both an injury and environmental incident.

**Volume per Active Rig Day (ARD):** Is the total volume divided by the number of active rig days.

### 3. INSTRUCTIONS FOR DATA COLLECTION WITHIN EACH CONTRACTOR COMPANY.

#### 3.1 General Instructions

- 3.1.1 Data should be collected on a country-by-country or division by division basis for all operations where the company has operations. Utilize Appendix "A" for entering data.
- 3.1.2 Emergency Mitigation Operations (drilling relief wells, well control operations, fire fighting operations); should be excluded for the purpose of environmental reporting.
- 3.1.3 Data should be normalized for comparison purposes by dividing by the number of active rig days.
- 3.1.4 Where possible, the use of 'unspecified' to describe data should be avoided.
- 3.1.5 Not all boxes on the data input form for recording quantities emitted/discharged/consumed need to be completed. However, **where there is an entry on any line, then all boxes on the line must be completed.** Entries should be limited to:
- a **numerical quantity**;
  - **0** (zero) to indicate emission/discharge level is zero;
  - **NDA** to indicate No Data are Available or collected;
  - **NR** to indicate that an entry is Not Relevant.

**Data should be reported specified units of measure and rounded to three significant figures.** Commas and blank spaces should not be used. For example, ten thousand should be written as 10000, but not 10,000, 10.000 or 10 000. Where appropriate, fractional values should be identified using a decimal point, i.e. the 'full stop' character on the keyboard.

#### 3.2 Particular instructions for completing data collection from Part 1.0 includes company preliminary information.

After the preliminaries at the top, the form is divided into sections, for each of which explanatory notes are listed below. Most sections of the form call for data onshore, offshore, or unspecified.

- 3.2.1 Enter the **year** corresponding to the data, not the year of submitting the data.

#### 3.2.2 Reporting Loss of Containment

Use Paragraph 1.1 of Appendix "A" for reporting loss of containment information.

- Bullet 1.1.1 - Enter the total number of events that have occurred during the year. Loss of Primary Containment would include both Regulatory reportable spills and Non-Regulatory reportable spills. Regulatory reportable spills are separate from Non-Regulatory reportable spills (see definitions)
- Bullet 1.1.2 - Quantities for the reporting year should be reported in gallons.
- Bullet 1.1.3 - Enter the company's total active rig days (ARD).
- Bullet 1.1.4 - has formulas to calculate the Number of Events per ARD.
- Bullet 1.1.5 - contains formulas to calculate the average volume per ARD.
- Bullet 1.1.6 - contains formulas to calculate the average volume per event.



### 3.2.3 Loss of Primary Containment

Use 1.2 of Appendix “A” for entering the type of failures that led to the Loss of Primary Containment. In the row for each category enter the number of events and the percent that number represents of the company total number of events as well as the total volume (gallons) spilled and the percent of the company’s total volume spilled.

The “Totals” row has formulas that will automatically calculate the data entered above in that column.

The percent column has formulas that will automatically calculate the percent based on the volume per category divided by the company’s total volume.

### 3.2.4 Annual Energy Consumption

The total energy consumed should be based on the amount of diesel fuel (oil distillate) actually used by the rig/facility. If electrical power from a power line is used to operate rig equipment, the electrical power usage will need to be converted to equivalent barrels of diesel oil. Often the electric energy provider(s) can provide that information. Some may even be able to break the energy sources out if they use wind, natural gas, coal or fuel oil. If the information is not available from your provider calculations can be made using the following formulas. For example, for typical operations, metered kilowatt-hours can be converted to equivalent barrels of diesel oil as follows:

- One kilowatt-hour = 9,500\*\* British Thermal Units (BTU).
- One 42 gallon barrel of diesel oil = 5,800,000 British Thermal Units (BTU).

$$\frac{\text{Number of kwh} \times 9,500}{5,800,000} = \text{barrels diesel oil required to generate electricity used}$$

- One kilowatt-hour = 3.6 megajoules
- One 42 gallon barrel of diesel oil = 6,146 megajoules

$$\frac{\text{Number of kwh} \times 3.6}{6,146} = \text{barrels diesel oil required to generate electricity used}$$

This conversion formula does not account for energy loss in power lines, between the power production station and the meter.

Energy use calculations can be done automatically by going to the following web site and entering the number you wish to convert.

[http://www.unitconversion.org/unit\\_converter/energy.html](http://www.unitconversion.org/unit_converter/energy.html)

\* When the energy value of the fuel differs significantly, or an alternative fuel is used, the appropriate energy value of the fuel should be used.

\*\* Source is US Department of Energy. This number may differ based on current governmental estimates, but for purposes of this reporting guideline, 9,500 is being used.

[http://intensityindicators.pnl.gov/delivered\\_electricity.stm](http://intensityindicators.pnl.gov/delivered_electricity.stm)

Fuel consumption, not metered electrical use, should be used where rig power is provided locally by diesel driven generators.

### 3.2.8 ATMOSPHERIC EMISSIONS includes combustion, etc. Data for Table 1.4 should be populated with data that is developed from consolidating engine emissions data from all operating rigs.

- CH<sub>4</sub> is methane released to the atmosphere, from any source, including fugitive losses;



- NMVOCs (Non-Methane Volatile Organic Compounds) are all hydrocarbons, other than methane, released to the atmosphere;
- SO<sub>2</sub> is the sum of sulfur dioxide (SO<sub>2</sub>) and sulfur trioxide (SO<sub>3</sub>) expressed as SO<sub>2</sub> equivalent; In the report, this is termed SO<sub>2</sub> and is understood as SO<sub>2</sub> equivalents;
- NO<sub>x</sub> is the sum of nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>) expressed as NO<sub>2</sub> equivalent. Nitrous oxide (N<sub>2</sub>O) is not included as a component of NO<sub>x</sub>;
- CO<sub>2</sub> is carbon dioxide emitted, **not** the carbon dioxide equivalents of the various greenhouse gases (GHG).
- Carbon monoxide (CO).

Several methodologies can be used to estimate atmospheric emissions from Rig Operations. It is important that individual companies are consistent in the methodology used to calculate emissions for all the operations on which they are reporting. This can be done by actual emissions monitoring or formulas utilizing the engine manufacturer's emissions specifications as per fuel used in the engine. Each company should indicate the type of method utilized for developing this data. API and other organizations have data base programs that may be used for gathering this information.



## Environmental Severity Matrix

Some companies may wish to add a severity rating to spills, if so, the following is a matrix that may be used.

ENVIRONMENTAL IMPACT	COMMUNITY/GOVERNMENT/ MEDIA REPUTATION	SEVERITY LEVEL
Contained onboard or contained in the secondary containment system and not onto the ground, into the water, or into the atmosphere.	No public concern. No attention from regulatory agency or client.	<b>1</b> <b>MINIMAL</b>
Release onto ground, into the water, or into atmosphere. Short-term effect (e.g., sheen dissipates quickly). Area of impact not in an environmentally sensitive area.	No minor public or media attention. Requires report to regulator. Reputation negatively affected with regulator, operator or site focused groups.	<b>2</b> <b>MINOR</b>
Release onto ground, into the water, or into atmosphere Moderate term effect (e.g., sheen is contained) Remediated with effective cleanup measures in house.	Local or regional media coverage and/or heightened concern by local community. Significant operator criticism. Requires meeting with regulatory agency regarding incident. Moderate damage to reputation with community and government.	<b>3</b> <b>MODERATE</b>
Release onto ground, into the water, or into atmosphere. Widespread medium to long term impacts to an environmentally sensitive area. Requires outside assistance for clean-up.	Significant adverse media/ public/ regulatory attention. May lose license to operate or not get future approvals. Increased regulatory audits and review of all activities.	<b>4</b> <b>MAJOR</b>
Release onto ground, into the water, or into atmosphere that impacts large area. Long term widespread effects. Requires long term clean-up efforts by outside contractors.	Serious public or media outcry (international coverage). License to operate threatened or revoked. Reputation severely tarnished. Share price may be affected.	<b>5</b> <b>EXTREME</b>