Guidelines for Using

Air Contaminant Discharge Permit (ACDP)

Series AQ400 Forms

Table of Contents

PURPOSE 2

AQ400 FORMS 2

GUIDANCE 2

Emission factors 3

Material balance: 4

Continuous monitoring data: 4

PURPOSE

Emissions detail sheets are necessary for providing the basis for the Plant Site Emissions Limit (PSEL) and tracking changes in emissions at the facility. For sources that existed in 1977 or 1978, the detail sheets need to show both the actual emissions in the baseline period (Form AQ401) and the projected emissions given the current configuration of the facility (Form AQ402). For sources that began operations after the baseline period, it is only necessary to show the projected emissions based on the current configuration of the facility.

AQ400 FORMS

Provided below is a list of the forms to be used to show pollutant emissions. Form AQ401 is required for sources that existed prior to 1979. Form AQ402 must be included in all applications. Form AQ403 is used for showing hazardous air pollutant emissions, if requested by LRAPA.

Form Number	Description
AQ401	Plant Site Emissions Detail – Baseline 1977/1978
AQ402	Plant Site Emissions Detail – Current/Future Operations
AQ403	Plant Site Emissions Detail – Hazardous Air Pollutants

For existing sources that had emissions during the baseline period, the applicant should carefully re-evaluate the emissions during the baseline period because the baseline emission rate will be frozen during the first permit action after July 1, 2002. After that time, the baseline emissions rate will only be recalculated if:

- A better emission factor is established for the baseline period and approved by LRAPA;
- A currently operating emissions unit that LRAPA formerly thought had negligible emissions, is determined to have non-de minimis emissions and needs to be added to the baseline emission rate; or
- A new pollutant is added to the regulated pollutants list (e.g., $PM_{2.5}$).

For sources that operated during the baseline period, the baseline emission rate is used to establish the netting basis. The netting basis is important because emission increases after the baseline period are compared to it to determine if the increases are greater than the significant emission rates, which would require additional analysis before the increases could be approved. In other words, changes at the facility can be approved on a faster track provided the plant site emissions stay within the netting basis plus the significant emission rate.

The permittee must obtain a Standard ACDP.in order to maintain a netting basis for the source. For all other types of permits, the netting basis will be re-set to zero with the first permit action after July 1, 2007.

GUIDANCE

There are three basic ways to determine emissions from a source:

1. actual measured emissions using a Continuous Emissions Monitoring System (CEMS) (note, continuous predictive emissions monitors also fit in this category);
2. material balance (primarily VOC sources and SO_2 from combustion devices); and
3. calculated emissions based on emissions factors and production or process rates.

Of these methods, the emission factor approach is probably the most common. The detail sheets need to show the emissions by device or activity.

Emission factors

In most cases, emissions are determined using emission factors and production or process rates. This is a very simple means of calculating normal actual or projected emissions. Normal is underlined because emission factors do not account for emission variations due to such things as startups, shutdowns, operating load fluctuations, ambient conditions, fuel quality, etc. However, emission factors are a useful tool for establishing historical emissions and the only way to determine emissions when continuous emissions monitors and/or material balance information is not available.

Emission factors relate mass of emissions to a process or production unit level. For example, a particulate matter emission factor for rock crushers relates mass of particulate matter emitted to tons of rock crushed (lb PM/ton of rock crushed). Using this factor, one only needs to know the total amount of rock crushed in the baseline period to determine the baseline emission rate, or the projected amount of rock that will be crushed to calculate the projected emissions. When using this method, the detail sheet needs to identify the emission source, annual production levels, the emission factor, and the calculated emissions. The basis for the factor should also be provided either in the detail sheet or as a supplement to the detail sheet. Emission factors should be based on the best available information, which could be, but is not limited to any of the following:

- actual source test data provided the equipment has not been modified;
- source test data from similar type equipment;
- industry factors based on studies of the processes;
- DEQ factors (use with caution)
- EPA AP-42 factors (use with caution as these are rated from A-E, depending on the confidence level); or
- Engineering estimates (this may include emission control factors)

An example detail sheet using emission factors is provided below:

Device	Pollutant	short term production level	annual production level	emission factor	reference	short term emissions (lbs/day)	annual emissions (tons/yr)
Rock Crusher	PM	900 tons/day	300,000 tons	0.041 lb/ton	DEQ	18.8	3.1
	PM_{10}	900 tons/day	300,000 tons	0.02 lb/ton	DEQ	3.0	0.5
Generator	PM	90 gal/day	24,000 gal.	42.5 lb/1000 gal	AIRS	3.0	0.4
	PM_{10}	90 gal/day	24,000 gal.	42.5 lb/1000 gal	AIRS	2.9	0.4
	CO	90 gal/day	24,000 gal.	130 lb/1000 gal	AIRS	9.2	1.2
	NO_x	90 gal/day	24,000 gal.	604 lb/1000 gal	AIRS	42.2	5.6
	SO_2	90 gal/day	24,000 gal.	39.7 lb/1000 gal	AIRS	2.8	0.4
	VOC	90 gal/day	24,000 gal.	49.3 lb/1000 gal	AIRS	2.9	0.4

It is not always necessary to show the emissions detail for each and every emissions source at a facility. If there are numerous devices that have the same emissions factor, it is possible to combine them in the detail sheet. For example, a facility may have 12 cyclones for which the same emission factor is used to calculate the emissions. In this case, the detail sheet could just have a line item for Cyclones and not address each one of the cyclones. The same could be true for multiple boilers, coating lines (see below), or any other device or process that uses the same emission factor and production or process data to calculate the emissions. When there are multiple devices or activities at a facility, it is sometimes better to organize the detail sheet by pollutant rather than by device so that it is easier to show total emissions by pollutant.

Material balance:

Sometimes emissions can be determined by a material balance calculation. This means that the mass of pollutant emitted is equal to the mass of pollutant used in the process. One example of this would be solvent cleaning. If the mass of emissions does not equal the mass used in the process, then a combination of material balance and emission factors or control factors will probably need to be used to determine the emissions. An example of this would be styrene emissions from fiberglass processes. Only a portion of the VOC is emitted because much of it goes into the product. Another example would be a coating line that uses a thermal oxidizer to control the VOC emissions. Material balance may be used for determining the amount of VOC going to the thermal oxidizer, but the emissions are determined by applying a control factor for the thermal oxidizer. In either case, the detail sheets should provide the basis for the baseline emission rate and PSEL. Provided below is one example:

Process	*VOC used in process (lb/day)	*VOC used in process (ton/yr)	VOC emission factor	1 – VOC control factor	VOC (lb/day)	VOC (ton/yr)
Coating line 1	1000	120	1.0	1.0	1000	120
Coating line 2	1000	120	1.0	0.1	100	12
Fiberglass 1	1000	120	.35	1.0	350	42
Fiberglass 2	1000	120	.35	0.1	35	4.2

* VOC used in the process is determined using material safety data sheets and assuming that all VOC is emitted to the atmosphere. The material balance equation depends on the type of product, but the following is a common approach:

$$VOC = M \times d \times \%VOC/100$$

where, VOC = amount of VOC used in the process (lbs);
M = gallons of VOC containing material used (gallons);
d = density of VOC containing material (lb/gallon);
%VOC = VOC content of the material as a percent by weight.

For showing the baseline emission rate, the detail sheet will include actual data from the baseline period. However, for proposed PSELs, it may not be necessary to use a detail sheet to show the basis of the PSEL when using a material balance approach. If you don't use a detail sheet, the formulas for calculating the emissions should be clearly stated; especially when there is a mix of controlled and uncontrolled processes.

Continuous monitoring data:

In rare cases, there may be a continuous emissions monitoring device on an emissions unit so that the PSEL can be determined from actual emissions data. This would be extremely rare because there were not very many CEMS in place during the baseline period and new sources cannot have CEMS data until they begin operations. However, if there is CEMS data, the detail sheet does not need to provide any information about production or emission factors unless there is some other need for the information. Provided below is an example detail sheet using CEMS data.

Device	Pollutant	Production (1000 lb of steam/day)	Production (1000 lb of steam/yr)	emission factor (lb/1000 lb of steam)	reference	short term emissions (lbs/day)	annual emissions (tons/yr)
Boiler A	PM/PM_{10}	7200	2,500,000	0.04 lb/1000 lb steam	ST data	288	50
	CO	NA	NA	NA	CEMS	14,200	2500
	NO_x	NA	NA	NA	CEMS	2,232	388
	SO_2	7200	2,500,000	0.014lb/1000 lb steam	DEQ	101	18
	VOC	7200	2,500,000	0.13 lb/1000 lb steam	ST data	936	163

NA means not applicable.

Although detail sheets are useful tools for summarizing the emissions information about a facility, they are not the only way to present the information. For sources that have only one type of pollutant emissions and those emissions are determined by a material balance, it may be simpler to describe the emissions in a narrative type format and provide equations for calculating the emissions. However, there should be some basis to the emissions other than a calculation procedure. In most cases, the basis will be the baseline emission rate, but for newer sources, a typical operating year may be used to show the emissions by individual devices or processes.