

4.3.1.2 Waste Analyses for Ignitable and Reactive Wastes

Permit writers should allow treatment of ignitable and reactive wastes in OB/OD units only if such wastes cannot be managed safely in other units. To

that end, permit applicants are required to provide information on waste characterization information to justify use of OB/OD. Many types of waste streams that are ignitable or reactive can be managed safely in other types of units, such as incinerators (for example, popping furnaces for small arms ammunition) or BIFs.

The determination is based on the means by which the generator has classified the waste as ignitable. EPA's definition of an ignitable waste includes:

- Liquid wastes that have a flash point of less than 140°F (60°C)
- An oxidizer, as defined by Department of Transportation (DOT) in 49 CFR §173.151
- An ignitable compressed gas, as defined by DOT in 49 CFR §173.300
- A solid wastes capable under standard temperature and pressure of causing fire through friction, absorption of moisture, or spontaneous chemical changes and that when ignited, burn so vigorously and persistently that they present a hazard

EPA has approved SW-846 Method 1030 for determining whether a material “burns so vigorously and persistently that it creates a hazard.” However, the method is only guidance and it’s use is not required under 40 CFR §261.21(a)(2).

Wastes that fall into any of the first three categories listed above should not normally be treated in OB/OD units because they typically can be treated disposed of by more conventional hazardous waste treatment or disposal technologies, such as incinerators or BIFs. For wastes in the first category, permit applicants are required to use SW-846 Method 1010 to determine whether the waste is ignitable. Because Method 1010 applies only to liquid wastes, permit applicants may be required to use the paint filter liquids test (SW-846 method 9095) to determine whether a waste is a liquid. Ignitable wastes included in the second and third categories listed above are defined by DOT regulations as safe for transport. A waste that falls into the fourth category may be a candidate for OB. For such wastes, the permit writer should require that the applicant provide a convincing rationale for treating these wastes by OB.

The open burning of solvents is strictly prohibited per 40 CFR §265.832.

In contrast, treatment of OB/OD may be the only practicable methods of treatment or disposal for many types of reactive wastes. Because such wastes may be affected by unique handling considerations, conventional hazardous waste treatment technologies (for example, incineration) may not be capable of safely managing them. In addition, many commercial laboratories are not equipped for, and will not accept, certain types of PEP wastes that are classified as reactive.

SW-846 Test Methods can be found on-line at <http://www.epa.gov/epaoswer/hazwaste/test/main.htm>

EPA classifies several types of wastes as reactive hazardous wastes, including any waste that meet any of the following criteria:

1. It is normally unstable and readily undergoes violent change without detonating
2. It reacts violently with water; forms potentially explosive mixtures with water; or, when mixed with water, generates toxic gases, vapors, or fumes in quantities that may threaten human health or the environment
3. It is a cyanide- or sulfide-bearing waste that, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors, or fumes in quantities that may threaten human health or the environment
4. It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if it is heated under confinement
5. It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure
6. DOT defines it as a forbidden explosive (49 CFR §173.54), or a Class 1.1 through Class 1.3 explosive (49 CFR §173.53)

Permit writers should require that the permit applicants clearly state why a waste is considered reactive (which of the categories listed above applies to the applicant's wastes). Permit writers should not allow wastes in categories 2 and 3 that are capable

of generating toxic gases, mists, or fumes to be treated in OB/OD units because emissions from these units will be uncontrolled. Although EPA had established threshold concentration levels and test methods for evaluating potentially reactive cyanide- or sulfide-bearing wastes in 1985, that guidance has been rescinded. Until the agency issues replacement guidance, characterization of reactive cyanides and sulfides will be based on the generator's knowledge of the waste. The 6th criterion of a DOT classified forbidden explosive has also been modified. The DOT regulations (cited in 40 CFR §261.23(a)(8)) have recently been changed and expanded to conform with Department of Defense hazard classes, therefore presenting difficulties in implementing the federal regulatory definition of reactivity under RCRA. Until such time that §261.23(a)(8) is updated, those DOT regulations cannot be used for determining reactivity.

For all other types of potentially reactive wastes, the permit writer should require that the Subpart X permit applicant characterize the waste as one for which OB/OD is the only practicable treatment or disposal option before permitting treatment of the waste in that manner. Those wastes include those that exhibit explosive reactivity. Although no standard EPA methods are available for evaluating whether wastes would be appropriate for OB/OD, several methods are provided by other authorities are available. Those methods include:

- **A stability test** performed by heating the residue to 75°C for 48 hours. A waste is considered reactive due to instability if a sample of it detonates, deflagrates, or decomposes exothermically during the test. The test defines a forbidden explosive according to 49 CFR §173.51.
- **A detonation test**, performed by inserting a blasting cap into a sample and observing the detonation. Reaction of the sample to a strong initiating source and Class A explosives as defined in 49 CFR §173.53 are tested in this manner.

- **A spark test**, performed by inserting a time fuse or an electric squib into a sample and observing the waste for deflagration or detonation. This test explosives as defined in 49 CFR §173.53 and 49 CFR §173.88.

Reactivity tests are dangerous to conduct and generally not available commercially or at most DoD installations. The concentration of energetics for a sample can be used to define the reactivity criteria. Extensive tests conducted by the US Army using spark/gap tests for 36 sites have confirmed that soil/ground water samples are not reactive.

Examples of reactive wastes that may be treated or disposed of in Subpart X units include TNT, white phosphorous, and sodium and magnesium metals.