

RULE 903 MERCURY
Adopted 6-2-75
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INDEX

- 100 GENERAL**
 - 101 PURPOSE

- 200 DEFINITIONS**
 - 201 CELL ROOM
 - 202 CONDENSER STACK GASES
 - 203 DENUDER
 - 204 END BOX
 - 205 END BOX VENTILATION SYSTEM
 - 206 HYDROGEN GAS STREAM
 - 207 MERCURY
 - 208 MERCURY CHLOR-ALKALI CELL
 - 209 MERCURY CHLOR-ALKALI ELECTROLYZER
 - 210 MERCURY ORE
 - 211 MERCURY ORE PROCESSING FACILITY
 - 212 SLUDGE
 - 213 SLUDGE DRYER

- 300 STANDARDS**
 - 301 MERCURY ORE PROCESSING
 - 302 SLUDGE INCINERATION PLANTS
 - 303 OTHER REQUIREMENTS

- 400 ADMINISTRATIVE REQUIREMENTS**
 - 401 TESTING
 - 402 REPORTING

- 500 MONITORING AND RECORDS**
 - 501 MERCURY ORE PROCESSING
 - 502 MERCURY CHLOR-ALKALI PLANTS - HYDROGEN AND END BOX VENTILATION GAS STREAMS
 - 503 MERCURY CHLOR-ALKALI PLANTS - CELL ROOM VENTILATION SYSTEM
 - 504 SLUDGE INCINERATION AND DRYING PLANTS
 - 505 EMISSION MONITORING

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100 GENERAL

101 **PURPOSE:** To limit the emission of mercury to the atmosphere.

200 DEFINITIONS

201 **CELL ROOM:** A structure(s) housing one or more mercury electrolytic chlor-alkali cells.

202 **CONDENSER STACK GASES:** The gaseous effluent evolved from the stack or processes utilizing heat to extract mercury metal from mercury ore.

203 **DENUDER:** A horizontal or vertical container which is part of mercury chlor-alkali cell and in which water and alkali metal amalgam are converted to alkali metal hydroxide, mercury, and hydrogen gas in a short-circuited, electrolytic reaction.

204 **END BOX** A container(s) located on one or both ends of a mercury chlor-alkali electrolyzer which serves as a connection between the electrolyzer and denuder for rich and stripped amalgam.

205 **END BOX VENTILATION SYSTEM:** A ventilation system which collects mercury emissions from the endboxes, the mercury pump sumps, and their water collection system.

206 **HYDROGEN GAS STREAM:** A hydrogen stream formed in the chlor-alkali cell denuder.

207 **MERCURY:** The element mercury, excluding any associated elements, and including mercury in particulates, vapors, aerosols, and compounds.

208 **MERCURY CHLOR-ALKALI CELL:** A device which is basically composed of an electrolyzer section and a denuder (decomposer) section and utilizes mercury to produce chlorine gas, hydrogen gas, and alkali metal hydroxide.

209 **MERCURY CHLOR-ALKALI ELECTROLYZER:** An electrolytic device which is part of a mercury chlor-alkali cell and utilizes a flowing mercury cathode to produce chlorine gas and alkali metal amalgam.

210 **MERCURY ORE:** A mineral mined specifically for its mercury content.

211 **MERCURY ORE PROCESSING FACILITY:** A facility processing mercury ore to obtain mercury.

212 **SLUDGE:** Sludge produced by a treatment plant that processes municipal or industrial waste waters.

213 **SLUDGE DRYER:** A device used to reduce the moisture content of sludge by heating to temperatures above 65°C (ca. 150°F) directly with combustion gases.

300 STANDARDS

301 **MERCURY ORE PROCESSING:** Emissions to the atmosphere from those stationary sources which process mercury ore to recover mercury and those which use mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide shall not exceed 2,300 grams of mercury per 24-hour period.

302 **SLUDGE INCINERATION PLANTS:** Emissions to the atmosphere from sludge incineration plants, sludge drying plants, or a combination of these that process wastewater treatment plant sludges shall not exceed 3,200 grams of mercury per 24-hour period.

- 303 **OTHER REQUIREMENTS:** If any other rule in these Rules and Regulations is more restrictive, that rule shall apply.

400 ADMINISTRATIVE PROCEDURES

- 401 **TESTING:** Unless a waiver of emission testing is obtained under Rule 901, Section 403, or has been previously granted under 40 CFR 61.13, each owner or operator shall test emissions:
- 401.1 Within 90 days of the effective date of this rule; and
 - 401.2 Within 90 days of startup in the case of a new source.
- 402 **REPORTING:** The Air Pollution Control Officer shall be notified at least 30 days prior to an emission test, so that he may at his option observe the test. At his option, the Air Pollution Control Officer may conduct the required test.

500 MONITORING AND RECORDS

501 MERCURY ORE PROCESSING FACILITY:

- 501.1 Samples shall be taken over such a period or periods as are necessary to accurately determine the maximum emissions which will occur in a 24 hour period. No changes in the operation shall be made which would potentially increase emissions above that determined by the most recent source test until the new emission level has been estimated by calculation and the results reported to the Air Pollution Control Officer.
- 501.2 All samples shall be analyzed, and mercury emissions shall be determined within 30 days after the source test. Each determination shall be reported to the Air Pollution Control Officer by a registered letter dispatched before the close of the next business day following such determination.
- 501.3 Records of emission test results and other data needed to determine total emissions shall be retained at the source and made available for inspection by the Air Pollution Control Officer for a minimum of two years.

502 MERCURY CHLOR-ALKALI PLANTS - HYDROGEN AND END BOX VENTILATION GAS STREAMS:

- 502.1 Samples shall be taken over such a period or periods as are necessary to accurately determine the maximum emissions which will occur in a 24 hour period. No changes in the operation shall be made, which would potentially increase emissions above that determined by the most recent source test, until the new emission has been estimated by calculation and the results reported to the Air Pollution Control Officer.
- 502.2 All samples shall be analyzed and mercury emissions shall be determined within 30 days after the source test. All of the determinations shall be reported to the Air Pollution Control Officer by a registered letter dispatched before the close of the next business day following such determination.
- 502.3 Records of emission test results and other data needed to determine total emissions shall be retained at the source and made available for inspection by the Air Pollution Control Officer for a minimum of two years.

503 MERCURY CHLOR-ALKALI PLANTS - CELL ROOM VENTILATION SYSTEM:

- 503.1 Stationary sources using mercury chlor-alkali cells may test cell room emissions in accordance with Section 401 of this rule or demonstrate compliance with Section 503.2 and assume ventilation emissions of 1,300 grams/day of mercury.
- 503.2 An owner or operator may carry out approved design, maintenance, and housekeeping practices. A list of approved design, maintenance and housekeeping practices may be obtained from the Air Pollution Control Officer.

504 **SLUDGE INCINERATION AND DRYING PLANTS:**

- 504.1 Method 101 of Rule 901 Section 402 or sludge sampling in Section 504.6 shall be used to test the emissions as follows:
- a. The test shall be performed within 90 days of the effective date of these regulations in the case of an existing source or a new source which has an initial startup date preceding the effective date.
 - b. The test shall be performed within 90 days of startup in the case of a new source which did not have an initial startup date preceding the effective date.
- 504.2 Samples shall be taken over such a period or periods as are necessary to determine accurately the maximum emissions which will occur in a 24 hour period. No changes shall be made in the operation which would potentially increase emissions above the level determined by the most recent stack test until the new emission level has been estimated by calculation and the results reported to the Air Pollution Control Officer.
- 504.3 All samples shall be analyzed, and mercury emissions shall be determined within 30 days after the stack test. Each determination shall be reported to the Air Pollution Control Officer by a registered letter dispatched before the close of the next business day following such determination.
- 504.4 Records of emission test results and other data needed to determine total emissions shall be retained at the source and shall be made available for inspection by the Air Pollution Control Officer for a minimum of two years.
- 504.5 As an alternative means for demonstrating compliance with Section 302 an owner or operator may use Method 105 of Appendix B 40 CFR 61 (April 6, 1973) and the procedures specified in this section.
- a. Sludge shall be sampled according to Section 504.6b; sludge charging rate for the plant shall be determined according to Section 504.5c and sludge analysis shall be performed according to Section 504.5d.
 - b. The sludge shall be sampled, after dewatering and before incineration or drying, at a location that provides a representative sample of the sludge that is charged to the incinerator or dryer. Eight consecutive grab samples shall be obtained at intervals of between 45 and 60 minutes and thoroughly mixed into one sample. Each of the eight grab samples shall have a volume of at least 200 ml. but not more than 400 ml. A total of three composite samples shall be obtained within an operating period of 24 hours. When the 24-hour operating period is not continuous, the total sampling period shall not exceed 72 hours after the first grab sample is obtained. Samples shall not be exposed to any condition that may result in mercury contamination or loss.
 - c. The maximum 24-hour period sludge incineration or drying rate shall be determined by use of a flow rate measurement device that can measure the mass rate of sludge charged to the incinerator or dryer with an accuracy of plus, or minus 5% over its operating range. Other methods of measuring sludge mass charging rates may be used if they have received prior approval by the Air Pollution Control Officer.
 - d. The handling, preparation, and analysis of sludge samples shall be accomplished according to the Method 105, Appendix B 40 CFR 61 (April 6, 1973).
 - e. The mercury emissions shall be determined by use of the following equation:

$$E_{hg} = 1 \times 10^{-3} (C)(Q)$$

- where: E_{hg} = mercury emissions, g/day
 C = mercury concentration of sludge on a dry solids basis ug/g (ppm).
 Q = sludge charging rate; kg/day

- f. No changes in the operation of a plant shall be made after a sludge test has been conducted which would potentially increase emissions above the level determined by the most recent sludge test, until the new emissions level has been estimated by calculation and the results reported to the Air Pollution Control Officer.
- g. All sludge samples shall be analyzed for mercury content within 30 days after the sludge sample is collected. Each determination shall be reported to the Air Pollution Control Officer by a registered letter dispatched before the close of the next business day following such determination.
- h. Records of sludge sampling, charging rate determination and other data needed to determine mercury content of wastewater treatment plant sludges shall be retained at the source and made available for inspection by the Air Pollution Control Officer for a minimum of two years.

505 **EMISSION MONITORING:** Wastewater treatment plant sludge incineration and drying plants, for which mercury emissions exceed 1,600 g/day, demonstrated by any of the methods specified in this rule, shall monitor mercury emissions at intervals of at least once per year by any of the methods specified in this rule.