

**RULE 1202 and RULE 40(n)  
HEXAVALENT CHROMIUM - COOLING TOWERS**

**WORKSHOP REPORT**

A workshop notice was mailed to all known and/or expected facilities with cooling towers in San Diego County, the Environmental Protection Agency [EPA], the California Air Resources Board [ARB] and other interested parties.

The workshop was held on November 8, 1990, and was attended by 12 people. As a result of comments received prior to the workshop, changes were made to the District fee charged [Rule 40(n)] for the evaluation of each plan required by Rule 1202 and to testing requirements. These changes were specifically discussed at the workshop. The District response to workshop comments is as follows:

**PRE-WORKSHOP TELEPHONE COMMENT:**

Would this rule apply to a company that has never used any chemical additive in its cooling tower? If so, why?

**DISTRICT RESPONSE:**

This proposed regulation is based on the state Air Toxics Control Measure (ATCM) and will affect all cooling towers - even those which do not now use, or which have never used chromate-based additives. Both the ARB and the District have concluded that the risks posed by even small releases of hexavalent chromium are very significant. Additionally, there are significant economic incentives for using chromate-based additives. The state ATCM requires two tests of all cooling towers, but allows local districts to modify that requirement for towers that have never used chromate-based additives. Accordingly, the proposed rule will require a minimum of one test for such cooling towers in order to properly enforce this proposed regulation.

**PRE-WORKSHOP TELEPHONE COMMENT:**

Why is a second test required?

**DISTRICT RESPONSE:**

As noted above, the state ATCM requires a minimum of two tests for most cooling towers. A second test is required by Rule 1202 only in cases where chromate-based additives have been used in the cooling tower within the last year. This is necessary because of the possibility of redissolving of chromate materials from cooling tower water sludge, cooling tower walls, or porous materials in the cooling tower. The two tests are also needed because of uncertainties in the testing and to be consistent with the state ATCM.

**WORKSHOP COMMENT:**

Why is chromate used in cooling towers?

**DISTRICT RESPONSE:**

Hexavalent Chromium in the form of chromate-based additives is used to prolong the life and maintain the efficiency of cooling tower equipment. Chromates act as corrosion inhibitors, anti-fouling agents, fungicides, biocides, and anti-scaling agents.

**WORKSHOP COMMENT:**

Will the regulation apply to the operation of a fiberglass cooling tower?

**DISTRICT RESPONSE:**

Yes. Chromate-based additives are used in fiberglass cooling towers for purposes other than anti-corrosion.

**WORKSHOP COMMENT:**

What is meant by "submission of a plan"?

**DISTRICT RESPONSE:**

The plan is a formal report submitted to the APCD which provides the District with information regarding the cooling tower. Submission of this plan is a requirement of the rule.

**WORKSHOP COMMENT:**

Are swamp coolers regulated by proposed Rule 1202?

**DISTRICT RESPONSE:**

No. Ordinary swamp coolers do not meet the definition of a cooling tower and are therefore not regulated by the proposed rule.

**WORKSHOP COMMENT**

Who will be responsible for performing testing required by this regulation?

**DISTRICT RESPONSE**

Testing for purposes of determining compliance with this rule must be performed in accordance with the testing provisions of this rule and will be the responsibility of the owner or operator of the cooling tower.

**WORKSHOP COMMENT:**

Who are the companies capable of doing the testing? Are there any local companies which perform Cr(VI) water testing? What is the cost of these tests?

**DISTRICT RESPONSE:**

The District conducted a telephone survey of testing laboratories listed in the telephone directory and determined that at least seven local laboratories are capable and willing to perform testing specified in the proposed regulation. Testing costs varied from \$25 to \$75 per sample. Two labs indicated that the cost per sample analysis decreases with submission of more than one sample. It is suggested that several labs be contacted and the possibility of submitting multiple or pooled samples be investigated. The District will publish and provide a listing of the laboratories identified in this survey.

**WORKSHOP COMMENT:**

The fees associated with the implementation of this program will be approximately \$35 for the submission of the plan and \$20 dollars per cooling tower. What will this money be used for?

**DISTRICT RESPONSE:**

The District estimates that the one-time cost for the review of the plan, the scheduling of visits to some facilities, and the maintenance of files for the plans will be approximately \$35. The cost associated with inspecting cooling towers and reviewing cooling tower test reports is an additional \$20 per cooling tower.

**WORKSHOP COMMENT:**

Can hexavalent chromium (chromates) be purchased across-the-counter?

**DISTRICT RESPONSE:**

Cooling tower additives containing chromate-based compounds are still available and can be purchased across-the-counter for facilities operating industrial cooling towers. Chromic acid can be purchased without restriction.

**WORKSHOP COMMENT:**

Given the toxicity of hexavalent chromium [Cr(VI)], why is it being manufactured?

**DISTRICT RESPONSE:**

Hexavalent chromium is used for a number of purposes other than as an additive in cooling towers, including chrome plating, chromic acid anodizing and photography. With careful controlled use, it can be used in some applications, without emissions to the air.

**WORKSHOP COMMENT:**

Does the District have any direction regarding sample taking, sample volume, sample handling, chain of custody, or any other sampling requirements?

**DISTRICT RESPONSE:**

The District recommends strict adherence to requirements of the analytical laboratory providing testing services. A sampling methodology is not required in plans (reports) submitted to the District.

**WORKSHOP COMMENT:**

What is the two years worth of recordkeeping for? Is retesting required every two years? Could the wording of the proposed regulation be changed so that records would not be required to be maintained for two years? What happens to records in three years?

**DISTRICT RESPONSE:**

To allow maximum flexibility and to minimize program costs to affected facilities, the proposed regulation will require that test reports be maintained for two years and made available to District personnel upon request. The District plans to inspect cooling towers at facilities having District permits during the regular annual permit renewal inspection. Non-permitted facilities affected will be inspected on a schedule designed to minimize program enforcement costs. In both cases this may mean that inspections may not occur for two years from the date of rule adoption. Two years is not an unreasonable period of time to maintain one or more testing reports.

Following two consecutive tests showing compliance (and in some cases after a single test showing compliance) with the concentration limits of the regulation, additional testing is not required.

Wording changes to the proposed regulation specifying maintenance of records for less than two years would conflict with the State ATCM and would result in a regulation less stringent than the adopted ATCM. The District is required to adopt a regulation at least as stringent as the ATCM. Therefore, recordkeeping requirements of two years are necessary. While the District suggests that these type of records be maintained indefinitely, records will not be required to be kept for more than two years after testing.

**WORKSHOP COMMENT:**

Should an analysis (test report) of the water be submitted when the report is submitted? Will the District request that a copy of the testing results be submitted?

**DISTRICT RESPONSE:**

No. Test reports of chromate content of cooling tower additives will have to be maintained on-site for at least two years and made available to Air Pollution Control District personnel, but will not have to be mailed to the District.

**WORKSHOP COMMENT:**

Will the regulation apply to the construction of a plant which will include two cooling towers? If so, what would be the fee and when will the plan need to be submitted?

**DISTRICT RESPONSE:**

Yes, the regulation will be applicable. When the rule becomes effective, a plan will be required and at least one test of the cooling tower water must be performed. It is estimated that the fee will be \$35 for the submission of the plan and \$20 per tower, or in this case a total of \$75.

**WORKSHOP COMMENT:**

What is the purpose of testing newly installed cooling towers which have never used chromate additives?

**DISTRICT RESPONSE:**

There are some economic advantages for using chromate-based additives. This testing will provide the District with verification of compliance with the statewide ban of chromate additives.

**WORKSHOP COMMENT:**

Is the purpose of this regulation really for checking for the use of chromates?

**DISTRICT RESPONSE:**

This proposed regulation represents the implementation of a ban on the use of chromate-based additives for cooling towers. The testing requirement represents an enforcement tool for verifying compliance with the ban.

**WORKSHOP COMMENT:**

Why is a statement necessary that chromate-based additives are not being used?

**DISTRICT RESPONSE:**

To ensure compliance with this regulation, the District must first identify all affected cooling towers. The submission of the plan will provide the District with information regarding the location and operation of cooling towers in San Diego County. The required statements in the plan serve as acknowledgements that the rule applies and that chromate additives are banned. The testing ensures that chromate-based additives have not been unknowingly added.

**WORKSHOP COMMENT:**

Will a notice regarding the filing of the required report be issued?

**DISTRICT RESPONSE:**

Yes. All those attending the workshop will receive a copy of the workshop report and will be placed on a mailing list which will include all known and/or likely cooling tower facilities. A notice regarding the adoption and requirements of this proposed regulation will be mailed to all facilities on this list.

**WORKSHOP COMMENT:**

What happens in the case of a visit to a facility having a cooling tower which has not been tested or reported to the District?

**DISTRICT RESPONSE:**

The facility would likely be issued a Notice of Violation and an appropriate penalty may be levied.

**WORKSHOP COMMENT:**

What happens if a test conducted by the District shows an exceedance of the concentration standard while the testing performed by another testing lab shows compliance with the standard?

**DISTRICT RESPONSE:**

In a situation concerning disputed testing information, the District would likely require an additional test to resolve the disagreement. Appropriate action would be taken following resolution of the disputed testing.

**WORKSHOP COMMENT:**

Possible disputes resulting from incorrect laboratory analysis of cooling tower water are of concern. Should certified labs be consulted to do this water testing? The District should require that testing be performed by certified labs. Also, Notices of Violation should not be issued in cases where certified labs have been used to perform the analysis and only minor (within the standard error of the test method) exceedance of the concentration standard is observed.

**DISTRICT RESPONSE:**

The question of certified labs was not addressed by the ARB in the development of this Air Toxics Control Measure and the ARB did not require or recommend that testing be performed by certified labs.

The District has looked into laboratory certification and has found that there is a laboratory accreditation program in California; however, the District cannot recommend one lab over another - even an accredited lab over one which has not been accredited. Individuals desiring that testing be performed by an accredited testing laboratory may contact the Environmental Laboratory Accreditation Program Southern California office at (213) 620-3564 or the main offices in Berkeley at (415) 540-2800.

**WORKSHOP COMMENT:**

The two-year recordkeeping requirement is of concern. Employee turnover and periodic changes in designated company division responsibilities make it difficult to maintain records. These recordkeeping requirements appear to be a "set-up".

**DISTRICT RESPONSE:**

The ATCM specifies that testing reports be maintained for two years. The District does not agree that maintenance of records will be as difficult as represented.

**WORKSHOP COMMENT:**

The District has recommended that companies attempt to follow the ARB ATCM rule development process. The state association [California Fabricare Institute] has heard nothing about this ARB ATCM.

**DISTRICT RESPONSE:**

As part of the statewide development of toxic air contaminant control measures, workshop notices are routinely sent to a large mailing list. The ARB indicated that The California Fabricare Institute in Cupertino is on the mailing list for toxics workshops.

**WORKSHOP COMMENT:**

Following state adoption of the ATCM, will the San Diego Air Pollution Control District implement the regulation?

**DISTRICT RESPONSE:**

Yes the District is required by law (AB1807) to propose and adopt a local regulation which is at least as stringent as the ARB ATCM. In this way, the state regulation is implemented and enforced at the local level.

**WORKSHOP COMMENT:**

Can the proposed regulation be more strict than the ARB ATCM?

**DISTRICT RESPONSE:**

Yes, the District may propose a local regulation which is more stringent than the ARB ATCM.

**WORKSHOP COMMENT:**

How many plans must be submitted for two cooling towers?

**DISTRICT RESPONSE:**

The proposed regulation requires only one plan for each facility. Both towers will have to be reported in the plan and both will have to be tested in accordance with the appropriate provisions of the proposed regulation.

**WORKSHOP COMMENT:**

Will the proposed regulation affect an evaporative condenser at a grocery store?

**DISTRICT RESPONSE:**

If the evaporative condenser is used to evaporate circulating water in order to remove heat from a process, it will be affected by this proposed regulation.

**WORKSHOP COMMENT:**

What are the alternatives to chromate additives?

**DISTRICT RESPONSE:**

The ARB has investigated alternatives to chromate additives. Those listed in their report include: zinc, phosphonates, phosphates, molybdenum, and azoles. These materials can be used to substitute for the specific characteristic properties of chromate additives. Based on information received from water treatment professionals and cooling tower operators, ARB expects usage of phosphates, phosphonates and zincs to show the highest increases. None of these substitutes are currently listed on either the Governor's Proposition 65 list or the ARB priority list for toxic air contaminant identification evaluation. The District will provide a listing of the non-chromate substitutes investigated by ARB with the District's notification of Rule Adoption. The manufacturer of your cooling tower should be consulted regarding what materials are recommended for your specific requirements.

**WORKSHOP COMMENT:**

What is Method 312B?

**DISTRICT RESPONSE:**

For the purposes of this proposed regulation, Method 312B is a test method which is used to determine the concentration of hexavalent chromium [Cr(VI)] in circulating water in cooling towers. The method is published in the Sixteenth Edition of *Standard Methods for the Examination of Water and Wastewater* which is published by the American Public Health Association.



**Proposed addition of Rule 1202 to Regulation XII and addition of Section (p) to Rule 40 of Regulation II.**

1. Proposed addition of Rule 1202 is to read as follows:

**RULE 1202 HEXAVALENT CHROMIUM - COOLING TOWERS**

**(a) APPLICABILITY**

This rule applies to any person who owns or operates, or who plans to build, own, or operate, cooling tower equipment within San Diego County.

**(b) EXEMPTIONS**

This rule is not applicable to any cooling tower utilized exclusively in connection with any structure which is designed and used as a dwelling for not more than four families.

**(c) DEFINITIONS**

For the purposes of this rule the following definitions shall apply:

- (1) **"Chromium"** means hexavalent chromium or chromate.

(2) **"Cooling Tower"** means a device which uses fans or natural draft to evaporate circulating water in order to remove heat from a process, a building, or a refrigerator. This includes, but is not limited to, evaporative condensers, quench towers or cooling towers used for heating, ventilation, or air conditioning (HVAC) or cooling industrial processes.

- (3) **"New Cooling Tower Equipment"** means any cooling tower equipment installed after ~~(Date of Notice of APCD Public Workshop)~~ (Date of Adoption).

**(d) STANDARDS**

- (1) Except as provided in Subsection (d)(2), no person shall operate a cooling tower unless:

(i) Hexavalent chromium-containing compounds are not added to the cooling tower circulating water;

(ii) The hexavalent chromium concentration in the circulating water does not equal or exceed 0.15 milligrams hexavalent chromium per liter of circulating water; and

(iii) Circulating water is tested to determine the chromium concentration within six months after (Date of Adoption). Except as specified in Subsection(s) (d)(4)(ii), (d)(4)(iii) or (d)(4)(iv), such testing shall be performed every six months.

(2) No person shall operate a wooden cooling tower unless:

(i) Hexavalent chromium-containing compounds are not added to the cooling tower circulating water;

(ii) The Air Pollution Control Officer is notified in writing that the tower has wooden components that are exposed to the circulating water;

(iii) Circulating water is tested to determine the hexavalent chromium concentration every month;

(iv) The hexavalent chromium concentration in the cooling tower circulating water decreases each month as determined by the testing specified in Subsection (d)(2)(iii);

(v) The hexavalent chromium concentration in the circulating water does not exceed 8 milligrams hexavalent chromium per liter of circulating water; and

(vi) By (12 months after effective date) the hexavalent chromium concentration in the circulating water does not exceed 0.15 milligrams hexavalent chromium per liter of circulating water.

(3) In addition to the requirements of Subsections (d)(1) and (d)(2), as appropriate, no person shall operate any new or replacement cooling tower unless:

(i) Upon start-up of the cooling tower, circulating water is tested to determine the chromium concentration; and

(ii) The District is notified in writing at least 90 days prior to operation of the equipment of the following:

(A) The owner and operator of the cooling tower;

(B) The location of the cooling tower;

(C) When the cooling tower will start operation; and

(D) A statement that hexavalent chromium-containing compounds will not be used in the circulating water of the cooling tower.

(4) Testing Requirements:

(i) Testing of the circulating water of a cooling tower shall be conducted in accordance with Method 312B. "Method 312B" means American Public Health Association Method 312B for testing aqueous solutions for hexavalent chromium. The method is presented in *Standard Methods of Examination of Water and Wastewater, Sixteenth Edition*, or most recent edition, published by the American Public Health Association.

(ii) When two consecutive required tests each demonstrate a hexavalent chromium concentration less than 0.15 milligrams of hexavalent chromium per liter of circulating water, further testing will not be required. The Air Pollution Control Officer may, for good cause, require that such testing be resumed, or,

(iii) If hexavalent chromium-containing additives have not been used in the cooling tower for at least one-year prior to the compliance date and the required test demonstrates a hexavalent chromium concentration less than 0.15 milligrams of hexavalent chromium per liter of circulating water, further testing will be not be required. The Air Pollution Control Officer may, for good cause, require that such testing be resumed; or,

(iv) If hexavalent chromium-containing additives have never been used in the cooling tower and the required test demonstrates a hexavalent chromium concentration less than 0.15 milligrams of hexavalent chromium per liter of circulating water, further testing will not be required. The Air Pollution Control Officer may, for good cause, require that such testing be resumed.

(5) Recordkeeping: Any person subject to Subsections (d)(1), (d)(2) and (d)(3) of this rule shall maintain records for two years of the results of all required tests of circulating water, the trade name and address of the manufacturer of, and the chemical names of each water treatment additive used. These records shall be provided immediately to the District upon request.

**(e) COMPLIANCE SCHEDULE**

(1) Any person subject to Subsections (d)(1) and (d)(2) of this rule shall on or before (Date of Adoption + 90 days), submit a compliance plan containing the following information:

- (i) The facility address and the specific location of each cooling tower at the facility;
- (ii) The name, address and phone number of the facility owner and operator;
- (iii) What portions of each cooling tower, if any, are constructed of wood;
- (iv) A statement specifying whether or not the cooling tower uses hexavalent chromium-containing compounds; and
- (v) A statement specifying how compliance with this rule will be achieved.

(2) On or before (Date of Adoption + 180 days) any person subject to Subsection (d)(1) shall demonstrate compliance with the requirements of Subsection (d)(1) of this rule to the satisfaction of the Air Pollution Control Officer.

(3) On or before (Date of Adoption + 12 months) any person subject to Subsection (d)(2) shall demonstrate compliance with the requirements of Subsection (d)(2)(vi) of this rule to the satisfaction of the Air Pollution Control Officer.

2. Proposed addition of Section (p) is added to Rule 40 to read as follows:

**RULE 40. PERMIT AND OTHER FEES**

**(p) COOLING TOWER FEES**

The owner or operator of any stationary source for which a plan is required pursuant to Rule 1202 of the Rules and Regulations of the Air Pollution Control District shall pay to the District a fee of \$85 \$35 for the evaluation of each plan as well as \$20 for each cooling tower described in the plan.

The fees required by this rule shall be due at the time the plan is received. If the appropriate fee is not paid within 60 days of the due date, a penalty fee equal to 30 percent of the applicable fee shall be added to the plan review fee. An additional penalty of 10 percent of the applicable fee shall be added for each subsequent calendar month, or portion thereof.

Whenever the Air Pollution Control Officer finds that it is necessary for the Air Pollution Control District to collect a sample(s) of the cooling tower circulating water for off-site analysis, the cost of analysis shall be paid by the source. The cost shall be equal to the cost determined by using the labor rates specified in Schedules 94 and the actual cost of collection and analysis of the sample(s).