TO: Joint Committee on Drinking Water Additives – Treatment Chemicals
FROM: France Lemieux, Chair of the Joint Committee
DATE: March 23, 2020
SUBJECT: Proposed revision to NSF/ANSI/CAN 60 – Drinking Treatment Chemicals- Health Effects
(60i87r1)

Revision 1 of NSF/ANSI/CAN 60 issue 87 is being forwarded to the Joint Committee for consideration. Please review the proposal and submit your ballot by April 13, 2020 via the NSF Online Workspace <www.standards.nsf.org>.

**Purpose**
The proposed revision will add 3-chloro-1,2-propanediol to the minimum test battery for epichlorohydrin, a polyamine-based coagulant, under Table 4.1.

**Background**
At the 2019 DWA-TC JC meeting, NSF reported that they had received an inquiry regarding 3-chloro-1,2-propanediol (3-MCPD) as a possible contaminant. NSF had not historically tested for it, but they decided to conduct a survey of certified products to evaluate its prevalence. The survey included samples from January to December 2019, and most of the samples were from currently certified polyamines. Of the 29 polyamines tested, 12 had positive detections. The highest level detected was 1.2 ug/L, and the rest were close to the reporting limit. NSF reported that 3-MCPD does not currently have a risk assessment conducted per NSF/ANSI/CAN 600. However, NSF toxicologists are developing a drinking water criteria, which will be reviewed by the Health Advisory Board (HAB) and the Joint Peer Review Steering Committee (JPRSC). Preliminary work suggests the TAC may settle between 6 and 30 ug/L. If the SPAC is set to be 1/10th the TAC, then some products may exceed the SPAC criteria for chronic health effects. NSF therefore proposed to add 3-chloro-1,2-propanediol to the minimum test battery under Table 4.1.

Please refer to the 2019 DWA-TC JC meeting summary excerpt and the original issue paper (DWA-60-2019-3) under the referenced items for additional information.

If you have any questions about the technical content of the ballot, you may contact me in care of:

France Lemieux
Chair, Joint Committee on Drinking Water Additives
c/o Monica Leslie
Joint Committee Secretariat
NSF International
Tel: (734) 827-5643
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4 Coagulation and flocculation chemicals

<table>
<thead>
<tr>
<th>Chemical type (description)</th>
<th>Synonyms</th>
<th>Formula (CAS number)</th>
<th>Approximate molecular weight</th>
<th>Preparation Method</th>
<th>Typical use level (mg/L)</th>
<th>Minimum test batteries of chemistry-specific analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>acrylamide / acrylic acid copolymer (polyelectrolytes)</td>
<td>—</td>
<td>(31212-13-2)</td>
<td>4 to 30 million</td>
<td>—</td>
<td>1.0</td>
<td>acrylamide, acrylic acid, acrylonitrile, 3-hydroxypropene nitrile, isobutane nitrile</td>
</tr>
<tr>
<td>polyaluminum silicate sulfate (metal salt coagulant)</td>
<td>PASS, aluminum hydroxide sulfate</td>
<td>(53810-32-5)</td>
<td>variable</td>
<td>Method K, Annex N-1, Section N-1.3.12</td>
<td>— / 26.8</td>
<td>metals, base / neutral scan</td>
</tr>
<tr>
<td>poly (epichlorohydrin / dimethylamine) (polyamines) (polyelectrolytes)</td>
<td>EPI/DMA, polyamine</td>
<td>(25988-97-0) or (42751-79-1)</td>
<td>30 thousand to 3 million</td>
<td>—</td>
<td>10.0</td>
<td>epichlorohydrin, 1,3-dichloro-2-propanol, 1,2-dichloro-3-propanol, 3-chloro-1,2-propanediol</td>
</tr>
</tbody>
</table>
### Table 4.1
Coagulation and flocculation products – Product identification and evaluation

<table>
<thead>
<tr>
<th>Chemical type (description)</th>
<th>Synonyms</th>
<th>Formula (CAS number)</th>
<th>Approximate molecular weight</th>
<th>Preparation Method</th>
<th>Typical use level (mg/L)(^1)</th>
<th>Minimum test batteries of chemistry-specific analyses(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>polyethyleneamines (polyelectrolytes)</td>
<td>—</td>
<td>(26913-06-4)</td>
<td>25 thousand to 1 million</td>
<td>—</td>
<td>10.0(^11)</td>
<td>glycidol, dimethylamine, ethylenediamine (if used as a branching agent)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>ethylene dichloride, ethylene diamine, epichlorohydrin, glycidol, 1,3-dichloro-2-propanol, 1,2-dichloro-3-propanol</td>
</tr>
<tr>
<td>resin amines (polyelectrolytes)</td>
<td>melamine / formaldehyde polymer</td>
<td>(9003-08-1)</td>
<td>10 thousand minimum</td>
<td>—</td>
<td>10.0(^11)</td>
<td>melamine, formaldehyde</td>
</tr>
<tr>
<td>sodium aluminate (metal salt coagulant)</td>
<td>aluminum sodium oxide</td>
<td>Na(_2)Al(_2)O(_4) (1302-42-7)</td>
<td>163.94</td>
<td>Method K, Annex N-1, Section N-1.3.12</td>
<td>43 / 26.8(^7)</td>
<td>metals(^5), base / neutral scan(^6)</td>
</tr>
<tr>
<td>sodium silicate(^12) (coagulant)</td>
<td>activated silica</td>
<td>Na(_2)O(SiO(_2))(_n) typically n = 3 (1344-09-8)</td>
<td>122 @ n = 1</td>
<td>Method A, Annex N-1, Section N-1.3.2</td>
<td>7.8</td>
<td>metals(^5)</td>
</tr>
<tr>
<td>starch, anionic (coagulant)</td>
<td>starch, base-hydrolyzed</td>
<td>(68412-33-9)</td>
<td>—</td>
<td>—</td>
<td>10</td>
<td>metals(^5)</td>
</tr>
</tbody>
</table>

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1 The typical use level is an application level which has been used historically in water treatment. The typical use level is not the maximum use level (MUL) for the product unless specifically stated.

2 Analysis for all chemistry-specific analytes in these minimum test batteries shall be performed each time the product is evaluated. Analysis shall also include formulation-dependent analytes as identified during formulation review. Testing for specific repackages, blends, or dilutions of previously certified products may be waived.

3 If nitrogen-containing initiators are used in these chemical types, evaluation shall include analysis for the initiator and any initiator by-products.

4 The typical use level for this product is based on an acrylamide polymer application of 1 mg/L and an acrylamide monomer level of 0.05% in the polymer, or equivalent (40 CFR § 141.111) for a carryover of not more than 0.5 ppb of acrylamide monomer into the finished water.

5 Metals = antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, selenium, thallium
## Table 4.1
Coagulation and flocculation products – Product identification and evaluation

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<th>Chemical type (description)</th>
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<th>Formula (CAS number)</th>
<th>Approximate molecular weight</th>
<th>Preparation Method</th>
<th>Typical use level (mg/L)&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Minimum test batteries of chemistry-specific analyses&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

6. A GC/MS analysis shall also be performed on this chemical type when recycled materials are used in the manufacturing process.

7. The first value is the typical use level as indicated by the chemical formula. The second value is the typical use level as aluminum oxide for the aluminum salts (aluminum chloride, aluminum sulfate, polyaluminum chloride, and sodium aluminate).

8. The first value is the typical use level as indicated by the chemical formula. The second value is the typical use level as Fe for the iron salts (ferric chloride, ferric sulfate, ferrous chloride, and ferrous sulfate).

9. The typical use level for this product is based on a polyDADMAC polymer application of 25 mg/L and a carryover of not more than 50 ppb of DADMAC into the finished water.

10. The typical use level for this product is based on an EPI/DMA polymer application of 10 mg/L and an epichlorohydrin monomer level of 0.01% in the polymer, or equivalent (40 CFR § 141.111) for a carryover of not more than 1 ppb of epichlorohydrin monomer into the finished water.

11. The typical use level of this product is expressed as mg/L of active polymer in the product as sold.

12. Sodium silicate may be used in conjunction with an acid-forming substance to produce activated silica. The net concentrations of sodium silicate and acid-forming substance are not to exceed the MULs for these chemicals individually.

Rationale: 3-chloro-1,2-propanediol added to minimum test battery for epichlorohydrin per 2019
DWA-TC JC meeting discussion (December 4, 2019).