**Section 355.205 Estimation of Projected Effluent Quality**

The Projected Effluent Quality (PEQ) is the estimation of the maximum expected effluent concentration. Individual PEQs shall be estimated for all summer and winter acute, chronic and subchronic exposure periods.

a) The PEQ shall be derived from representative facility specific data to reflect a 95 percent confidence level for the 95th percentile value. These data will be presumed to adhere to a lognormal distribution pattern with a coefficient of variation of 0.6 unless the facility's effluent data demonstrates a different distribution pattern. If facility specific data in excess of 10 data values is available, a facility specific coefficient of variation that is the ratio of the standard deviation to the arithmetic average may be calculated. The PEQ is derived as the upper bound of a 95 percent confidence bracket around the 95th percentile value through a multiplier from the following table applied to the maximum value in the data set that has its quality assured consistent with subsection (f).

PEQ = (maximum data point)(statistical multiplier)

Coefficient of Variation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| No. of Samples | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
|  |  |  |  |  |  |  |  |
| 1 | 1.4 | 1.9 | 2.6 | 3.6 | 4.7 | 6.2 | 8.0 |
| 2 | 1.3 | 1.6 | 2.0 | 2.5 | 3.1 | 3.8 | 4.6 |
| 3 | 1.2 | 1.5 | 1.8 | 2.1 | 2.5 | 3.0 | 3.5 |
| 4 | 1.2 | 1.4 | 1.7 | 1.9 | 2.2 | 2.6 | 2.9 |
| 5 | 1.2 | 1.4 | 1.6 | 1.8 | 2.1 | 2.3 | 2.6 |
| 6 | 1.1 | 1.3 | 1.5 | 1.7 | 1.9 | 2.1 | 2.4 |
| 7 | 1.1 | 1.3 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 |
| 8 | 1.1 | 1.3 | 1.4 | 1.6 | 1.7 | 1.9 | 2.1 |
| 9 | 1.1 | 1.2 | 1.4 | 1.5 | 1.7 | 1.8 | 2.0 |
| 10 | 1.1 | 1.2 | 1.3 | 1.5 | 1.6 | 1.7 | 1.9 |
| 11 | 1.1 | 1.2 | 1.3 | 1.4 | 1.6 | 1.7 | 1.8 |
| 12 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 |
| 13 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 |
| 14 | 1.1 | 1.2 | 1.3 | 1.4 | 1.4 | 1.5 | 1.6 |
| 15 | 1.1 | 1.2 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 |
| 16 | 1.1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 |
| 17 | 1.1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.4 | 1.5 |
| 18 | 1.1 | 1.1 | 1.2 | 1.3 | 1.3 | 1.4 | 1.5 |
| 19 | 1.1 | 1.1 | 1.2 | 1.3 | 1.3 | 1.4 | 1.5 |
| 20 | 1.1 | 1.1 | 1.2 | 1.2 | 1.3 | 1.4 | 1.4 |
| 30 | 1.0 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 |
| 40 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| 50 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 60 or greater | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

Coefficient of Variation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| No. of Samples | 0.8 | | 0.9 | 1.0 | 1.1 | 1.2 | 1.3 |
|  |  | |  |  |  |  |  |
| 1 | 10.1 | | 12.6 | 15.5 | 18.7 | 22.3 | 26.4 |
| 2 | 5.4 | | 6.4 | 7.4 | 8.5 | 9.7 | 10.9 |
| 3 | 4.0 | | 4.6 | 5.2 | 5.8 | 6.5 | 7.2 |
| 4 | 3.3 | | 3.7 | 4.2 | 4.6 | 5.0 | 5.5 |
| 5 | 2.9 | | 3.2 | 3.6 | 3.9 | 4.2 | 4.5 |
| 6 | 2.6 | | 2.9 | 3.1 | 3.4 | 3.7 | 3.9 |
| 7 | 2.4 | | 2.6 | 2.8 | 3.1 | 3.3 | 3.5 |
| 8 | 2.3 | | 2.4 | 2.6 | 2.8 | 3.0 | 3.2 |
| 9 | 2.1 | | 2.3 | 2.4 | 2.6 | 2.8 | 2.9 |
| 10 | 2.0 | | 2.2 | 2.3 | 2.4 | 2.6 | 2.7 |
| 11 | 1.9 | | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 |
| 12 | 1.9 | | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 |
| 13 | 1.8 | | 1.9 | 2.0 | 2.1 | 2.2 | 2.3 |
| 14 | 1.7 | | 1.8 | 1.9 | 2.0 | 2.1 | 2.2 |
| 15 | 1.7 | | 1.8 | 1.8 | 1.9 | 2.0 | 2.1 |
| 16 | 1.6 | | 1.7 | 1.8 | 1.9 | 1.9 | 2.0 |
| 17 | 1.6 | | 1.7 | 1.7 | 1.8 | 1.9 | 1.9 |
| 18 | 1.6 | 1.6 | | 1.7 | 1.7 | 1.8 | 1.9 |
| 19 | 1.5 | | 1.6 | 1.6 | 1.7 | 1.8 | 1.8 |
| 20 | 1.5 | | 1.5 | 1.6 | 1.6 | 1.7 | 1.7 |
| 30 | 1.3 | | 1.3 | 1.3 | 1.3 | 1.4 | 1.4 |
| 40 | 1.1 | | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| 50 | 1.1 | | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| 60 or greater | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

1) If the PEQ determined in this Section is less than or equal to the applicable acute water quality standard, there is no reasonable potential and no WQBEL will be established in the permit unless otherwise warranted under Section 355.201(c).

2) If the PEQ as determined in this Section exceeds the applicable acute water quality standard but does not exceed the PEL determined through Section 355.209, there is no reasonable potential and no WQBEL will be established unless otherwise warranted under Section 355.201(c).

b) The Agency shall compare calculated PEQ values derived from monthly average effluent data, when available, with the applicable chronic water quality standard to evaluate the need for monthly average WQBEL using the same method described in subsection (a) of this Section. If a monthly average WQBEL is included in an NPDES permit, the Agency will also include a daily maximum WQBEL to enforce the acute water quality standard.

c) The Agency shall compare calculated PEQ values derived from the highest weekly average total ammonia effluent data, when available, with the applicable subchronic water quality standards to evaluate the need for a weekly average WQBEL using the same method described in subsection (a) of this Section.

d) The Agency may apply other scientifically defensible statistical methods for calculating PEQ at the 95 percent upper confidence level for use in the reasonable potential analysis. For new or existing discharges where no prior operating record is available, PEQ shall be estimated based on knowledge of the tributary wastewater characteristics and treatment facility capabilities. For existing sources where the PEQ for the term of the permit cannot be accurately characterized by historical performance data as specified in subsection (a) of this Section due to significant changes in tributary loading, plant operating parameters or other factors affecting treatment efficiency during the term covered by the permit, a PEQ representative of the future permit term may be estimated by analysis of the historical data consistent with subsection (a) with adjustment of the historical value to reflect the change expected from the anticipated loading or operating changes.

e) Regardless of the statistical procedure used, if the PEQ for ammonia nitrogen (as N) is less than or equal to the water quality standard, the Agency shall deem the discharge not to have a reasonable potential to exceed and a WQBEL shall not be required unless otherwise required under Section 355.201.

f) Data Requirements

The derivation of PEQ is based on the effluent quality demonstrated by self-monitoring data as required by the NPDES permit or Agency-generated data, such as effluent sampling or facility-related stream studies. Effluent data used in the derivation of PEQ shall be representative of the concentration and variability of ammonia nitrogen in the discharge anticipated for the applicable period of the NPDES permit. Data shall be collected and analyzed in accordance with USEPA or Agency approved sampling and analytical methods (40 CFR 136). The following criteria shall be followed in data selection:

1) the most recent five years of data shall be used unless the Agency determines that an alternative period better represents the time period for which effluent quality is being projected. Such alternative time periods may include, but are not limited to, shorter periods that reflect changed discharge characteristics resulting from changes in manufacturing activities or wastewater treatment systems; and

2) data anomalies resulting from collection, analysis or recording errors or atypical plant operating conditions may be eliminated from the data.

(Source: Amended at 27 Ill. Reg. 15774, effective September 25, 2003)