# City of North Las Vegas, Nevada

# Local Limits

# Final Draft

**February 9, 2016**



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**City of North Las Vegas, Nevada**
**Industrial Pretreatment Program**
**Local Limits Revision**

## A. Purpose

The General Pretreatment Regulations (40 CFR Part 403) require that each Publicly Owned Treatment Works (POTW) with a pretreatment program develop and enforce Technically-Based Local Limits (TBLLs) which will establish the maximum loading of pollutants that can be accepted from industrial users without causing a violation of applicable environmental standards. Local limits are developed and enforced to prevent Pass Through, Interference, protect sludge disposal practices and prevent impacts to the health and safety of workers (40 CFR sections 403.2 and 403.5(c)(1)). The City of North Las Vegas (City) used the EPA July 2004 Local Limits Development Guidance (EPA 833-R-04-002A) as a framework for establishing limits to protect the POTW and environment (40 CFR 403.8(f)(4)). The City has an on-going pollutant monitoring program and permit which required sampling as specified in its National Pollutant Discharge Elimination System (NPDES) Permit (NV0023647) issued to the City of North Las Vegas Water Reclamation Facility (WRF). The State of Nevada has not been authorized to implement and enforce the Industrial Pretreatment Program under 40 CFR Part 403. EPA is the Approval Authority for the Pretreatment Program. The City is updating local limits pursuant to the requirements specified in the EPA Pretreatment Compliance Inspection Report dated March 6, 2015, and as required in an Administrative Order dated June 26, 2015. EPA and the City had conference call on September 15, 2015, based upon comments made by the City's Consultant in an email dated August 28, 2015, that requested the technical basis for guidance included in the Administrative Order.

## B. Municipal Organization

The City serves a population of approximately 230,788. The City has a Mayor and City Council form of government. The Mayor and City Council oversee the City Manager. The City Manager oversees the Department Directors. The Pretreatment Program is in the Utilities Department and this Department is managed by the Director of Utilities. The WRF Operations Supervisor reports to the Director of Utilities and oversees the Pretreatment Program. The Pretreatment Program staff are located at the Water Reclamation Facility.

Changes to the Pretreatment Program legal authority (City Code, 13.28) is initiated by the WRF Operations Supervisor with concurrence of the Director of Utilities. Review of draft changes are done within the Utilities Department. When there is a proposed change to a City Code, the draft language is provided to the City Attorney for review subsequent to management and staff review. The Utilities Department briefs the Mayor, City Manager and other departments, as appropriate. After review is completed by the City, the final draft submittal is sent to EPA for informal review. The City coordinates with EPA to resolve any issues that would interfere with processing the changes as a substantial modification to its Pretreatment Program and as a minor modification to the City's NPDES Permit. Once the EPA informal review is completed, the changes are introduced at the City Council meeting and the City submits to EPA for with an attorney's statement requesting approval. EPA public notices the



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proposed changes for at least 30 days in a newspaper of general circulation that provides meaningful public notice serving the City and other jurisdictions. After the EPA 30-day public comment period, EPA and the City will approve the changes to the Ordinance. The Mayor signs the final Ordinance.

## C. Description of POTW(s)

The City of North Las Vegas Water Reclamation Facility (WRF) is an advanced wastewater treatment facility designed to treat an average daily flow of 25 MGD and a peak hourly flow rate of 50 MGD. The WRF treats wastewater from the City of North Las Vegas to meet NDEP permit requirements for discharging into public waters. Wastewater flows by gravity into the WRF via the Southeast Interceptor. WRF process units include the Headworks Facility (HWF) which contains all the preliminary treatment for the WRF. Preliminary treatment includes coarse screening, influent pumping, grit removal, and fine screening. The wastewater then flows to the Membrane Bioreactor (MBR). The purpose of the bioreactor basins is two-fold. One function is to oxidize the biochemical oxygen demand (BOD) in the screened and degritted raw sewage by maintaining a biological (growing microorganisms) population within the basins to convert organic waste into a settleable (filterable) cell mass. The second function is to provide an environment that reduces the influent nitrogen and phosphorus levels to meet the discharge standards.

The biological treatment is performed in six parallel bioreactor basins. Each basin is divided into a series of zones, isolated from each other by submerged baffle weir walls. The configuration and sizing of these zones is based on the basic principles of biological nutrient removal, using a configuration adapted for use in MBRs that optimizes the enhanced biological removal of nitrogen and phosphorus while recognizing the unique differences in the quality and flow of return activated sludge (RAS) in MBR systems.

The zones within the MBR system include: pre-anoxic, anaerobic, anoxic, and aerobic zones. The primary purpose of the pre-anoxic zone is to reduce dissolved oxygen and nitrate concentrations prior to the RAS entering the anaerobic zone. The purpose of the anaerobic zone is to create conditions that promote the release of phosphorus by polyphosphate-accumulating organisms, resulting in a maximal increase in the soluble phosphorus concentration. The purpose of the anoxic zone is to reduce nitrate concentrations. The purpose of the aerobic zones is to provide conditions that permit aeration of a high mixed liquor concentration, oxidize BOD in the bioreactor influent (BI) feed stream, convert influent ammonia to nitrate, and uptake phosphorus.

Disinfection of the wastewater to meet limits is accomplished at the Chlorine Contact Basins (CCBs). Membrane permeate enters the chlorine contact basin via one of two 36-inch pipes from the MBR system. Chlorine solution is injected into the 48-inch CCB influent pipe upstream of a jet mixing system to ensure even distribution of chlorine throughout the CCB influent. Chlorine residual is monitored at both the upstream end of the CCB and the downstream end. Any residual chlorine in the effluent discharged to the Wash is dechlorinated using sodium bisulfite. Recycled water for reuse will receive an additional chlorine dose if needed prior to discharge to the customers. Effluent for plant water will be withdrawn after dechlorination. The CCB's are sized to disinfect peak flow should one basin be taken out of service.

Disinfected wastewater is used for plant utility water, reuse water (none sent off site currently) or is discharged to the Las Vegas Wash (LVW) as allowed by the City's NPDES permit. Wastewater flows over weirs into an effluent box and gravity flows to the LVW. The flow rate of water discharging to the Wash is measured by a magnetic flow meter on the discharge pipe.

The Solids Handling Facility removes water from scum and waste activated sludge (WAS) collected from the membrane bioreactors prior to solids disposal. This is done in two steps, thickening followed by dewatering. The thickening and dewatering equipment are designed to remove excess water from the solids in an effort to reduce the volume and weight of waste transported to a nearby landfill. The solids thickening equipment consists of Gravity Belt Thickeners (GBT). WAS pumped from the membrane bioreactor to the Solids Handling Facility is discharged onto the GBT's rotating belt. The belt is porous and allows water to pass through via gravity, which is then collected and drained back to the headworks for treatment. The remaining thickened waste activated sludge (TWAS) is then collected in a tank and pumped to the next step, dewatering.

The dewatering equipment consists of horizontal bowl centrifuges. The TWAS is pumped into the centrifuges where it is rotated at high speeds to centrifugally separate water from the solids that could not be separated via gravity. The separated water is collected and transported back to the facility's headworks for treatment. The remaining solids, also referred to as cake, are collected below the centrifuge, and conveyed to the cake load-out hoppers. The cake is stored in the fully enclosed, odor controlled hoppers prior to being loaded and hauled to a landfill for disposal. The sludge meets all standards for landfilling of solid waste.

Odor control captures, conveys and treats odorous compounds present in the air that are released during the wastewater treatment process. The odor control system is designed to remove the main odor causing compounds found at wastewater treatment plants such as hydrogen sulfide, methyl mercaptan and di-methyl sulfide. These compounds are detectible to humans at low concentrations and produce a distinct odor associated with wastewater treatment plants, while at higher concentrations they can be hazardous to humans and animals. The odor control system is designed to remove these compounds from the air to levels below which will not result in undesirable odors detectible outside of the facility. The odor control system for the WRF consists of two facilities. The first is for treatment of odors generated at the Headworks and Solids Handling Facilities, and utilizes a Granular Activated Carbon (GAC) system to remove the odorous compounds from the air stream. The second system is design to treat the odorous air generated at the MBR by atmospheric dispersion, through which the air is dispersed to a high elevation and diluted in the atmosphere.

The WRF site is designed to accommodate a future expansion of 25 MGD average daily flow by duplicating the existing facilities.

Receiving Water:

The POTW discharges to the Las Vegas Wash. The City can also discharge to the Sloan Flood Control Channel which is a concrete structure that discharges to the Las Vegas Wash. The receiving water has specific Standards established by the State (NAC 445A.198 and 445A.199). Protected uses include non-contact recreation, irrigation, livestock and freshwater marsh, wildlife and non-fish propagation. State Standards for Toxics are listed in NAC 445A.1236.

NPDES Permit Required Monitoring Frequency for Pollutants Relevant to the Local Limits Study

| Pollutant | NPDES Permit (covers outfalls 001 and 002) | |
|---|---|---|
| | Influent | Effluent |
| | | |
| Flow, Effluent | Continuous | Continuous |
| Pretreatment: Priority Pollutants (Section B.PT.1.2.1.) | 1 per year | 1 per year |
| Pretreatment: Detected Pollutants (B.PT.1.2.1.) | 1 per quarter | 1 per quarter |
| Pretreatment: Sludge (B.PT.1.2.1.) | 1 per year | 1 per year |
| Pretreatment: Sludge Detected (B.PT.1.2.1.) | 1 per quarter | 1 per quarter |
| NPDES Priority Pollutants | | 1 per quarter |
| Ammonia | | 1 per day |
| Biochemical Oxygen Demand ($BOD_5$), effluent | 1 per day | 1 per day |
| Nitrate+Nitrite | | 1 per week |
| Nitrogen, Inorganic, Total | | 1 per week |
| Orthophosphate | | 1 per day |
| Phosphorus | | 1 per day |
| Total Dissolved Solids (TDS) | | 1 per week |
| Total Kjeldahl Nitrogen | | 1 per week |
| Total Suspended Solids (TSS) | 1 per day | 1 per day |

The NPDES permit contains a Wasteload Allocation Table for Phosphorus and Ammonia-Nitrogen.

## D. Other Municipal/County/State Contributors

The City has industrial user discharges that discharge to the City wastewater collection system and the wastewater is ultimately treated by the Clark County Water Reclamation District.

## E. Significant Industrial Users

The City permits 29 Significant Industrial Users (SIUs) also known as Class I Industrial Users. In the current local limits evaluation, the City has developed limits for SIUs. Of the 29 SIUs, 23 SIUs are permitted to discharge to the City's WRF. The remaining 6 SIUs discharge to the Clark County WRF. The City has also included additional flow to allow the City to apply local limits to select non-Significant Industrial Users (non-SIUs). These non-SIUs will be permitted and limits applied at the discretion of the City. Currently, the City has not identified any non-SIUs where local limits would be applied. The City decision to establish local limits for Class I SIUs and other non-SIUs is being done consistent with the 2004 EPA Local Limits Guidance and 40 CFR Section 403.18(b)(2).



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## F. Local Limits Process

Local limits are those concentrations or loadings of pollutants that a POTW can accept and prevent Pass Through, Interference, adverse health effects, or a violation of the General and Specific Prohibitions. These limits are adopted by the POTW into their legal authority and apply at the point of discharge from the industrial user into the sewerage system. Local limits are Pretreatment Standards and are based on the Maximum Allowable Headworks Loading (MAHL).

The first step of the process is to review and compile data, supplementing data with additional monitoring where necessary. The POTW develops a list of Pollutants of Concern (POC) to further evaluate. When the final Pollutants of concern are identified, the POTW uses applicable standards and flows to calculate all applicable Allowable Headworks Loading (AHL) for each Standard. The POTW then uses the most stringent AHL, the MAHL, in calculating local limits.

To calculate the MAIL (or local limit), the POTW subtracts out an EPA recommended Safety Factor. The POTW then subtracts out domestic+commercial loadings to obtain the Maximum Allowable Industrial Load (MAIL), which is the regulatory number that EPA approves pursuant to 40 CFR Section 403.18(b). If the City is adopting uniform concentration-based local limits, the City may set aside some of the MAIL or include additional flow in the calculations for expansion of existing industrial users or new industrial users. This "set aside" is at the full discretion of the POTW and may be implemented without further notice to EPA as long as the approved MAIL does not change (see 40 CFR Section 403.18 and the 2004 EPA Local Limits guidance manual). The City may adopt uniform concentration limits, the MAIL the adjusted MAIL or a combination of these.

An example local limits calculation is shown in Attachment 1.

## G. Legal Authority Language

Existing Code Language: The City is revoking and re-adopting a new 13.28 for Local Limits that contains all Pretreatment Program Standards and requirements. This activity is separate from the local limits study, but occurring simultaneously.

New Code Language:

Section 13.28 Limitations on Wastewater Strength

C. Specific Discharge Limitations

1. No Class I Significant Industrial User (SIU) or other designated non-SIU shall discharge or cause to be discharged wastewater that exceeds the following limits:

| Pollutant[(a)] | Daily Maximum Discharge Limit (mg/L) |
|---|---|
| Arsenic | 0.44 |
| Cadmium | 0.035 |
| Chromium | 5.02 |
| Copper | 2.35 |
| Lead | 0.33 |
| Mercury | 0.058 |
| Nickel | 1.99 |
| Selenium | 0.21 |
| Silver | 1.53 |
| Zinc | 6.3 |
| Phosphorus, lbs/day[(b)] | 879 |

(a) All Pollutants as Total and in mg/L unless otherwise specified.

(b) This limit is the total mass in pounds per day (lbs/day) that are available to allocate to all Significant Industrial Users and other Permitted Industrial Users identified by the City. Allocations are at the sole discretion of the City.

2. The City may, at its sole discretion, implement local limits through allocation of the Maximum Allowable Industrial Load (MAIL) to Significant Industrial Users and specific permitted non-SIUs that correspond to the uniform concentration local limits shown in the table above. The MAILs that correspond to the Daily Maximum Discharge Limits are hereby incorporated by reference.

3. The following limits shall apply to wastewaters that are discharged from the groundwater cleanup of petroleum or gasoline underground storage tanks or other remediation wastewaters containing these pollutants or where these pollutants are appropriate surrogates. It shall be unlawful for any Industrial User to discharge or cause to be discharged any waste or wastewater that exceeds the following limits, as applicable.

| Pollutant[(a)(c)] | Daily Maximum Limit (mg/L) |
|---|---|
| Benzene | 0.050 |
| BTEX[(b)] | 0.750 |

(a) All pollutants shown in the Table are total.

(b) BTEX shall be measured as the sum of Benzene, Ethylbenzene, Toluene and Xylenes.

(c) These limits are based upon installation of air stripping technology as described in the EPA document: "Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks. June 1989."

## H. Pollutants of Concern (POC) Evaluation Criteria

The following criteria/data considerations were used to evaluate the POC pollutants consistent with the 2004 EPA Local Limits Guidance:

1. Pollutants of Concern established by EPA, including Arsenic, Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Nickel, Selenium, Silver, Zinc, $BOD_5$, Total Suspended Solids, Ammonia and Phosphorus. In addition, the following Local Limits were previously adopted by the City: Barium, Beryllium, Chromium (VI), Oil and Grease (mineral or petroleum), Oil and Grease (animal or vegetable), Organophosphorus or carbamate compounds, pH and Phenols. The City cannot identify the technical basis for the previous local limits that were approved by EPA to apply to all industrial users. The local limits appear to have been intended to apply to Significant Industrial Users.

2. Data review of POTW influent, effluent and sludge data (organics, metals and conventional pollutants).

3. POTW influent/effluent Priority Pollutant analyses, as required by the NPDES permit were reviewed.

4. Permit limited pollutants were reviewed and included in the sampling program, as appropriate (e.g. BOD, TSS, Phosphate, Ammonia).

5. Water Quality Standards as specified at NAC 445A.1236.

6. Inhibition was evaluated. However, no inhibition has been experienced and based upon operations and influent sampling is not expected to be an issue. Consistent with the 2004 EPA Local Limits guidance, site-specific inhibition studies were not conducted. If inhibition is observed, the City will develop site-specific inhibition values or utilize the data in Attachment 2 of this submittal.

7. Sludge was evaluated. However, the City landfills sludge and no Standards under 40 CFR Part 503 apply. No violations of solid waste disposal requirements, including the paint filter test and Toxicity Characteristic Leaching Procedure, have been identified as reported to the State of Nevada under the NPDES permit.

8. Pollutants that may cause adverse worker health and safety effects were evaluated. No pollutants were identified in sampling results that were an acute threat to worker health and safety.

9. Trucked and Hauled Waste. The POTW does not currently accept trucked and hauled waste.

The initial pollutants that were detected and considered potential Pollutants of Concern are shown below and reflect those pollutants recommended by EPA, of concern to the City or otherwise detected in POTW influent or effluent sampling. As allowed for in 40 CFR 403.8(f)(4) and consistent with the 2004 Local Limits Guidance, the City is evaluating some of the pollutants for the need for local limits as noted. Note: Pollutants not shown on the table had all POTW influent and effluent measurements <RL.

| Pollutant | Pollutant of Concern? | Comments |
|---|---|---|
| Flow | No | The POTW discharges within limits established by the State. The average POTW influent flow was 17.3 mgd (max 20.1 mgd). The NPDES permits allows for up to 25 mgd. |
| 2-Butanone (MEK) | No | No applicable Standards. 6 of 8 POTW effluent measurements <RL. |
| 3&4-Methylphenol | No | No applicable Standards. 5 of 6 POTW effluent measurements <RL. |
| 4-methyl-2-pentanone (MIBK) | No | No applicable Standards. 8 of 8 POTW effluent measurements are <RL. |
| 4-Methylphenol (p-Cresol) | No | No applicable Standards. 5 of 6 POTW effluent measurements <RL. |
| Acetone | No | No applicable Standards. 6 of 8 POTW effluent measurements are <RL. |
| Ammonia | No | The average POTW effluent averages 0.19 mg/L (27 lbs/day). The NPDES Permit allows 87 lbs/day (most stringent limit). The POTW will continue to evaluate SIUs for this pollutant. |
| Arsenic, Total | Yes | EPA Recommended. 18 of 19 influent measurements <RL and 18 of 20 effluent measurements <RL |
| Barium | No | No applicable Standards. Technical basis for previous local limit unknown. |
| Benzyl Alcohol | No | No applicable Standards. |
| Beryllium | No | All POTW effluent measurements <RL. No applicable Standards. Technical basis for previous local limit unknown. |
| bis(2-ethylhexyl)phthalate | No | 17 of 18 POTW effluent measurements <RL. No applicable Standards. |



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| Pollutant | Pollutant of Concern? | Comments |
|---|---|---|
| $BOD_5$ | No | The POTW is in full compliance with all effluent limits. The annual average cBOD design is 62,500 lbs/day (annual average) that is equivalent to 75,000 lbs/day BOD. The maximum monthly cBOD design is 81,315 lbs/day that is equivalent to a BOD design of 97,578 lbs/day. The source of this information is from the Greeley and Hansen design document, Section 2 titled "Original Basis of Design". The conversion factor of 1.2 was used to convert cBOD to BOD (from EPA Permit Writer's Guidance and others). Using 62,500 lbs/day * 1.2 = 75,000 lbs/day. The average influent loading is 50,240 lbs/day or 67% of the design based upon annual average data or 51% of the maximum monthly design data. The design data was not available as a daily maximum. Maximum monthly loading is thought to most closely represent the loading that a daily maximum local limit would be based upon. The City had established a surcharge limit in previous Ordinance and will evaluate surcharging in the future. |
| Boron | No | Maximum effluent concentration is 0.32 mg/L or 43% of the most stringent applicable Standard. |
| Bromodichloromethane | No | No applicable Standard. Generally, a byproduct of chlorination. The City has not identified this as a pollutant discharged by SIUs. |
| Cadmium, Total | Yes | EPA Recommended. 17 of 19 influent measurements <RL and 20 of 20 effluent measurements <RL. |
| Chlorodibromomethane | No | No applicable Standard. A byproduct of chlorination. The City has not identified this as a pollutant discharged by SIUs. |
| Chloroform | No | A byproduct of chlorination. No IU identified as being a source. Maximum influent concentration is 0.03 mg/L or 50% of the fume toxicity value. Average influent is 0.011 mg/L or 18% of the fume toxicity value. The City has not identified this as a pollutant discharged by SIUs. |
| Chloromethane | No | No applicable Standard. All effluent measurements <RL. |
| Chromium(VI), Dissolved | No | All effluent measurements <RL. No identified IU sources. Technical basis for previous local limit not known. |
| Chromium, Total | Yes | EPA Recommended. 15 of 19 influent measurements <RL and 20 of 20 effluent measurements <RL. |
| Copper, Total | Yes | EPA Recommended. 19 POTW influent measurements were >RL. 18 of 20 POTW effluent measurements were <RL. POTW influent Copper concentrations are typically driven by raw water source water that causes Copper to leach from pipes. The City will continue to regulate this pollutant. |

| Pollutant | Pollutant of Concern? | Comments |
|---|---|---|
| Cyanide | No | 17 of 19 influent measurements are <RL. No industrial user has been identified as using or discharging Cyanide. 13 of 20 effluent measurements are <RL. Commonly formed in the wastewater treatment process. |
| Fluoride | No | Effluent averages 58% of the applicable Standard. Source is drinking water. |
| Iron | No | Effluent averages 4% of the applicable Standard. |
| Lead, Total | Yes | EPA Recommended. 16 of 19 POTW influent measurements <RL and 20 of 20 POTW effluent measurements <RL. |
| Mercury, Total | Yes | EPA Recommended. 11 of 19 POTW influent measurements <RL and 17 of 17 effluent measurements <RL. Anticipate State will be requiring more sensitive test methods and EPA will promulgate Dental Categorical Standards. |
| Molybdenum, Total | No | Landfills sludge. POTW effluent is <1% of the Chronic WQS. |
| Nickel, Total | Yes | EPA Recommended. 17 of 19 POTW influent measurements <RL and 19 of 20 POTW effluent measurements <RL. |
| Nitrate+Nitrite | No | No applicable Standard. Not identified by State as a pollutant of concern. |
| N-Nitroso-dimethylamine | No | No applicable Standard. The City has not identified this as a pollutant discharged by SIUs. |
| N-Nitrosodi-N-propylamine | No | No applicable Standards. The City has not identified this as a pollutant discharged by SIUs. |
| Oil and Grease, Animal or vegetable | No | City has moved previous local limit of 250 mg/L to the Specific Prohibitions. POTW effluent average 1.1 mg/L. The City uses its FOG Program to control Oil and Grease where needed. |
| Oil and Grease, Mineral or Petroleum | No | City has moved previous local limit of 100 mg/L to the Specific Prohibitions. The City has not identified Petroleum Oil and Grease as a problem in the POTW influent or effluent (visual). The City uses its sand/oil separator program to control Petroleum based Oil and Grease where needed. |
| Organophosphorus or carbamate compounds | No | City has not identified any specific pollutants falling into these categories that are of concern. No applicable Standards. Technical basis for previous local limit unknown. |
| Phenol | No | Maximum POTW effluent is 0.012 mg/L. No applicable Standard. Technical basis for previous local limit unknown. |
| Phosphorus | Yes | Wasteload allocation in NPDES permit is 30 lbs per day (0.2 mg/L) as a long term average. POTW effluent averages 0.16 mg/L per day. The City had established a surcharge limit in previous Ordinance and will evaluate surcharging in the future. |
| Phosphorus - Ortho | No | No applicable Standard. |

| Pollutant | Pollutant of Concern? | Comments |
|---|---|---|
| Selenium, Total | Yes | EPA Recommended. 16 of 19 POTW influent measurements <RL and 18 of 19 POTW effluent measurements <RL. |
| Silver, Total | Yes | EPA Recommended. 17 of 19 POTW influent measurements <RL and 20 of 20 POTW effluent measurements <RL. |
| TDS | No | POTW has adopted a reporting requirement and source identification requirement for Class I SIUs and other designated IUs discharging >1200 mg/L. POTW effluent averages 887 mg/L or 47% of the annual average Standard. |
| TKN | No | No applicable Standard. See Ammonia. |
| Total Inorganic Nitrogen | No | No applicable Standard. See Ammonia. |
| Total Suspended Solids (TSS) | No | The POTW is in full compliance with all effluent limits. The annual average TSS design is 68,805 lbs/day (annual average) and the maximum monthly TSS design is 89,445 lbs/day. The current influent loading averages 46,198 lbs/day or 67% of the design based upon annual average data. The maximum daily influent loading is estimated at 83,734 lbs/day or 94% of the maximum monthly design data if all conventional data is evaluated at the 80$^{th}$ percentile value (580 mg/L). If newer data is used, the Maximum daily loading is 60,635 lbs/day or 68% of the monthly maximum. The design data was not available as a daily maximum and as is typical with POTW influents, TSS influent data is widely variable. The City has not violated its NPDES permit for TSS. The City had established a surcharge limit in previous Ordinance and will evaluate surcharging in the future. |
| Zinc, Total | Yes | EPA Recommended. POTW effluent measurements (n=20) showed an average of 0.058 mg/L. This is 15% of the most stringent Standard (0.388 mg/L – Chronic Aquatic Life). |

## I. Wastewater Treatment Plant Data Summaries for Local Limits

| | | |
|---|---|---|
| POTW Flow for Local Limits (mgd) | 17.3 | POTW design flow is 25 mgd |
| Average SIU Flow | 2.202 | 23 Permitted SIUs |
| Permitted SIU Flow for Local Limits (mgd): | 3.422 | |
| Flow for Permitted Non-SIU Industrial Users (mgd) | 0.02 | This allows the POTW to apply local limits to non-SIUs |
| Total SIU + Other Non-SIU Flows for Local Limits: | 3.442 | Used in conversion of MAIL to mg/L |
| Combined plus Domestic + Commercial Flow (mgd): | 14.46 | Calculated by subtracting out the average SIU flow and return flows. |
| Trucked and Hauled Wastewater Flow (mgd): | 0 | One waste hauler is permitted as a SIU. |
| I&I / Stormwater / Other: | 0 | |
| Sludge Flow to Disposal (mgd): | N/A | Sludge is Landfilled |
| Acute (mgd): | 0 | |
| Chronic (mgd): | 0 | |
| Agriculture Flow (mgd): | 0 | |
| Irrigation Flow (mgd): | 0 | |
| Hardness for Metals Calculations (mg/L): | 400 | State WLA |

The POTW flow for local limits reflects the actual POTW wastewater flow and includes reuse flows and the average flow for Significant Industrial Users (SIUs). The City has not currently identified any non-SIUs where the City intends to permit and apply local limits.

Applicable Standards for the Local Limits Evaluation

| North Las Vegas<br><br>Applicable Standards<br><br>Pollutant | POTW Design<br><br>lbs/day | NAC 445A.1236<br><br>Acute WQS<br><br>mg/L | NAC 445A.1236<br><br>Chronic WQS<br><br>mg/L | 445A.1236<br><br>Irrigation<br><br>mg/L | 445A.1236<br><br>Livestock<br><br>mg/L | 445A.199<br><br>State Existing Quality<br><br>mg/L |
|---|---|---|---|---|---|---|
| | | | | | | |
| Arsenic | | 0.34 | 0.15 | 0.1 | 0.05 | |
| Cadmium | | 0.0087 | 0.0008 | 0.01 | | |
| Chromium (Total) | | 5.7633 | 0.2682 | 0.10 | 1 | |
| Copper | | 0.0517 | 0.0306 | 0.2 | 0.5 | |
| Lead | | 0.4768 | 0.0186 | 5.0 | 0.1 | |
| Mercury | | 0.0014 | 0.00 | | 0.01 | |
| Nickel | | 1.5159 | 0.1685 | 0.2000 | | |
| Selenium | | 0.02 | 0.05 | 0.02 | 0.05 | |
| Silver | | 0.0411 | | | | |
| Zinc | | 0.3878 | 0.3878 | 2.0000 | 25 | |
| Phosphorus | 1900 | | | | | 0.2 |

POTW Influent Loading to the WRF

| North Las Vegas<br><br>Pollutant | Average POTW Influent mg/L | Comment and Notes | RL Handling | Average POTW Flow mgd | POTW Influent lbs/day |
|---|---|---|---|---|---|
| | | | | | |
| Arsenic | 0.0025 | n=19, 18<RL | ½ RL | 17.3 | 0.361 |
| Cadmium | 0.0006 | n=19, 17<RL | ½ RL | 17.3 | 0.087 |
| Chromium (Total) | 0.003 | n=19, 15<RL | ½ RL | 17.3 | 0.433 |
| Copper | 0.151 | n=19, 0<RL | N/A | 17.3 | 21.800 |
| Lead | 0.0017 | n=19, 16<RL | ½ RL | 17.3 | 0.245 |
| Mercury | 0.000068 | n=19, 11<RL | ½ RL | 17.3 | 0.009817 |
| Nickel | 0.006 | n=19, 17<RL | ½ RL | 17.3 | 0.866 |
| Selenium | 0.0025 | n=19, 16<RL | ½ RL | 17.3 | 0.361 |
| Silver | 0.0023 | n=19, 17<RL | ½ RL | 17.3 | 0.332 |
| Zinc | 0.24 | n=19, 1<RL | ½ RL | 17.3 | 34.648 |
| Phosphorus | 8.6 | n=956, 0<RL | N/A | 17.3 | 1241.6 |

POTW Effluent Loading to the WRF

| North Las Vegas<br>Pollutant | Average POTW Effluent mg/L | Comment and Notes | RL Handling | Average POTW Flow mgd | POTW Effluent lbs/day |
|---|---|---|---|---|---|
| | | | | | |
| Arsenic | 0.0020 | n=20, 18<RL | ½ RL | 16.5 | 0.275 |
| Cadmium | 0.00060 | n=20, 20<RL | ½ RL | 16.5 | 0.083 |
| Chromium (Total) | 0.0026 | n=20, 20<RL | ½ RL | 16.5 | 0.358 |
| Copper | 0.0232 | n=20, 18<RL | ½ RL | 16.5 | 3.194 |
| Lead | 0.00260 | n=20, 20<RL | ½ RL | 16.5 | 0.358 |
| Mercury | 0.0001 | n=17, 17<RL | ½ RL | 16.5 | 0.013779 |
| Nickel | 0.0056 | n=20, 19<RL | ½ RL | 16.5 | 0.771 |
| Selenium | 0.00240 | n=19, 18<RL | ½ RL | 16.5 | 0.330 |
| Silver | 0.00260 | n=20, 20<RL | ½ RL | 16.5 | 0.358 |
| Zinc | 0.058 | n=20, 1<RL | ½ RL | 16.5 | 7.986 |
| Phosphorus | 0.16 | n=956, 315<RL | ½ RL | 16.5 | 22.0 |

POTW Domestic+Commercial Loading to the WRF

| Pollutant | Domestic+ Commercial Contribution to POTW mg/L | Comment and Notes | RL Handling | Domestic plus Commercial Average Flow mgd | Calculated Domestic+Commercial Contribution lbs/Day |
|---|---|---|---|---|---|
| Arsenic | 0.0091 | n=15, 14<RL | ½ RL | 14.46 | 1.098 |
| Cadmium | 0.0012 | n=15, 14<RL | ½ RL | 14.46 | 0.145 |
| Chromium | 0.0025 | n=15, 14<RL | ½ RL | 14.46 | 0.302 |
| Copper | 0.0993 | n=15, 0<RL | N/A | 14.46 | 11.982 |
| Lead | 0.0045 | n=15, 15<RL | ½ RL | 14.46 | 0.543 |
| Mercury | 0.000083 | n=15, 11<RL | ½ RL | 14.46 | 0.010 |
| Nickel | 0.0035 | n=15, 11<RL | ½ RL | 14.46 | 0.422 |
| Selenium | 0.0145 | n=15, 13<RL | ½ RL | 14.46 | 1.750 |
| Silver | 0.0038 | n=15, 15<MDL | ½ RL | 14.46 | 0.459 |
| Zinc | 0.218 | n=15, 0<MDL | N/A | 14.46 | 26.306 |
| Phosphorus | 4.93 | n=15 | N/A | 14.46 | 594.9 |

POTW Sludge Metals Concentration

| Sewage Sludge<br><br>Pollutant | Maximum POTW Sludge to Disposal mg/kg Dry Weight |
|---|---|
| | |
| Arsenic | 0.954 |
| Cadmium | 0.27 |
| Chromium | 2.8 |
| Copper | 130 |
| Lead | 1.6 |
| Mercury | 0.27 |
| Nickel | 2.3 |
| Selenium | 2.8 |
| Silver | 0.38 |
| Zinc | 140 |

Note: The POTW landfills sludge. The actual data provided for informational purposes only. Sludge meets TCLP and Paint-filter tests. No applicable sludge standards.

Removal Efficiency Calculations

| North Las Vegas<br><br>Removal Efficiency Calculations<br><br>POLLUTANT | MRE Mean Removal Efficiency %[a] | LIT Literature Removal Efficiency % | Source of Literature Removal Efficiency Data[b] | Enter the Name of the Removal Efficiency to be Used: MRE, or LIT | Final POTW Removal % |
|---|---|---|---|---|---|
| | | | | | |
| Arsenic[b] | 20.0 | 53 | EPA-8th Decile | LIT | 53 |
| Cadmium[b] | 0 | 91 | EPA-8th Decile | LIT | 91 |
| Chromium (Total)[b] | 13.3 | 91 | EPA-8th Decile | LIT | 91 |
| Copper[b] | 84.6 | 95 | EPA-8th Decile | LIT | 95 |
| Lead[b] | -52.9 | 76 | EPA-8th Decile | LIT | 76 |
| Mercury[b] | -47.1 | 94 | CWACS (n=28) | LIT | 94 |
| Nickel[b] | 6.7 | 62 | EPA-8th Decile | LIT | 62 |
| Selenium[b] | 4.0 | 67 | EPA-8th Decile | LIT | 67 |
| Silver[b] | -13.0 | 88 | EPA-8th Decile | LIT | 88 |
| Zinc | 75.8 | | | MRE | 75.8 |
| Phosphorus | 98.1 | | | MRE | 98.1 |

(a) Removal Efficiency calculations based upon influent and effluent concentration.

(b) Default removal efficiencies were used for Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium and Silver values due to be being reported <RL in all or most POTW influent and/or effluent measurements. Mercury default data was used because data generated by POTWs using Method 1631E show consistent removal of 90-95%. The City used a 94% removal efficiency for Mercury literature data from CWACS (n=28). In the case of the other pollutants, the 8th decile data from the EPA guidance for tertiary treatment was used.

Allowable Headworks Loading Calculations

| North Las Vegas<br><br>AHL Calculations<br><br>Pollutant | POTW Design<br><br>lbs/day | Acute WQS<br><br>lbs/day | Chronic WQS<br><br>lbs/day | Livestock<br><br>lbs/day | Irrigation<br><br>lbs/day | 445A.199 State Existing Quality<br><br>lbs/day | Most Stringent<br>AHL for Common Stds<br>lbs/day | Name of<br>Most Stringent AHL |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| Arsenic | | 104.4368 | 46.0751 | 15.3584 | 30.7167 | | 15.3584 | Livestock |
| Cadmium | | 13.9556 | 1.2833 | | 16.0409 | | 1.2833 | State Chronic WQS |
| Chromium (Total) | | 9244.8775 | 430.2181 | 1604.0944 | 160.4094 | | 160.4094 | Irrigation |
| Copper | | 149.2770 | 88.3535 | 1443.6850 | 577.4740 | | 88.3535 | State Chronic WQS |
| Lead | | 286.8121 | 11.1886 | 60.1535 | 3007.6771 | | 11.1886 | State Chronic WQS |
| Mercury | | 3.3686 | 1.8527 | 24.0614 | | | 1.8527 | State Chronic WQS |
| Nickel | | 575.9163 | 64.0160 | | 75.9834 | | 64.0160 | State Chronic WQS |
| Selenium | | 8.7496 | 21.8740 | 21.8740 | 8.7496 | | 8.7496 | State Chronic WQS |
| Silver | | 49.4462 | | | | | 49.4462 | State Acute WQS |
| Zinc | | 231.6666 | 231.6666 | 14934.6724 | 1194.7738 | | 231.6666 | State Chronic WQS |
| Phosphorus | 1900 | | | | | 1552 | 1552 | State Existing Quality |

Maximum Allowable Industrial Loading (MAIL) Calculation

| Pollutant | MAHL lbs/day | Controlling Criteria or Standard for MAHL | Safety Factor %[a] | MAHL minus Safety Factor lbs/day | Subtract out Domestic+Commercial Loadings lbs/day | MAIL Maximum Available Industrial Loading lbs/day |
|---|---|---|---|---|---|---|
| | | | | | | |
| Arsenic | 15.3584 | Livestock | 10 | 13.8225 | 12.7244 | 12.7244 |
| Cadmium | 1.2833 | State Chronic WQS | 10 | 1.1549 | 1.0101 | 1.0101 |
| Chromium (Total) | 160.4094 | Irrigation | 10 | 144.3685 | 144.0668 | 144.0668 |
| Copper | 88.3535 | State Chronic WQS | 10 | 79.5182 | 67.5358 | 67.5358 |
| Lead | 11.1886 | State Chronic WQS | 10 | 10.0697 | 9.5267 | 9.5267 |
| Mercury | 1.8527 | State Chronic WQS | 10 | 1.6675 | 1.6574 | 1.6574 |
| Nickel | 64.0160 | State Chronic WQS | 10 | 57.6144 | 57.1921 | 57.1921 |
| Selenium | 8.7496 | State Chronic WQS | 10 | 7.8746 | 6.1249 | 6.1249 |
| Silver | 49.4462 | State Acute WQS | 10 | 44.5016 | 44.0430 | 44.0430 |
| Zinc | 231.667 | State Chronic WQS | 10 | 208.500 | 182.194 | 182.194 |
| Phosphorus | 1552 | State Existing Quality | 5 | 1474 | 879 | 879 |

(a) A safety factor of 5% was used for Phosphorus due to the large number of monitoring results and the City's belief that the data is accurate.

Local Limits Calculations

| Pollutant | Final MAIL lbs/day | MAHL lbs/day | Local Limits to be Adopted as (U)niform or (M)ass | Calculated SIU Limits | Units |
|---|---|---|---|---|---|
| Arsenic | 12.7244 | 15.3584 | U | 0.44 | mg/L |
| Cadmium | 1.0101 | 1.2833 | U | 0.035 | mg/L |
| Chromium | 144.0668 | 160.4094 | U | 5.02 | mg/L |
| Copper | 67.5358 | 88.3535 | U | 2.35 | mg/L |
| Lead | 9.5267 | 11.1886 | U | 0.33 | mg/L |
| Mercury | 1.6574 | 1.8527 | U | 0.058 | mg/L |
| Nickel | 57.1921 | 64.0160 | U | 1.99 | mg/L |
| Selenium | 6.1249 | 8.7496 | U | 0.21 | mg/L |
| Silver | 44.0430 | 49.4462 | U | 1.53 | mg/L |
| Zinc | 182.194 | 231.667 | U | 6.3 | mg/L |
| Phosphorus | 879 | 1552 | M | 879 | lbs/day |



ED_002461_00010594-00023

## J. Summary Pollutant Data (POTW Influent, Effluent, Domestic+Commercial)

The pollutants in the following table are as mg/L and total unless otherwise specified. Pollutant data is from samples August 2014-July 2015. Data for conventional pollutants (DMR monitoring) represents and includes older data collected from January 1, 2013 to August 2015. Newer data is used except where noted.

| INFLUENT - Pollutant | Average | Maximum | Minimum | Count | # <MDL |
|---|---|---|---|---|---|
| Flow (mgd) | 17.3 | 20.1 | 15.6 | 959 | 0 |
| 2,3,7,8-TCCD | 1.019E-9 | 1.4E-09 | 7.67E-10 | 10 | 10 |
| 2-Butanone (MEK) | 0.0037 | 0.0055 | 0.0027 | 3 | 0 |
| 3&4-Methylphenol | 0.052 | 0.067 | 0.038 | 5 | 0 |
| 4-methyl-2-pentanone (MIBK) | 0.0053 | 0.0053 | 0.0053 | 1 | 0 |
| 4-Methylphenol (p-Cresol) | 0.047 | 0.067 | 0.034 | 7 | 0 |
| Acetone | 0.14 | 0.28 | 0.044 | 3 | 0 |
| Ammonia from additional POTW monitoring | 26 | 43 | 17 | 21 | 0 |
| Ammonia from POTW DMR Monitoring | 24 | 54 | 11 | 959 | 0 |
| Antimony | 0.00125 | 0.00125 | 0.00125 | 13 | 13 |
| Arsenic, Total | 0.0025 | 0.0029 | 0.002 | 19 | 18 |
| Barium | 0.14 | 0.16 | 0.12 | 6 | 0 |
| Benzyl Alcohol | 0.019 | 0.02 | 0.018 | 2 | 0 |
| Beryllium | 0.0005 | 0.001 | 0.0005 | 19 | 19 |
| bis(2-ethylhexyl) phthalate | 0.014 | 0.068 | 0.005 | 18 | 13 |
| BOD5 from additional POTW monitoring. | 311 | 490 | 190 | 21 | 0 |
| BOD5 from POTW DMR Monitoring – This data used. | 348 | 740 | 120 | 955 | 0 |
| Boron | 0.3 | 0.3 | 0.2 | 11 | 0 |
| Bromodichloromethane | 0.0066 | 0.025 | 0.0025 | 19 | 15 |
| Cadmium, Total | 0.0006 | 0.0016 | 0.0005 | 19 | 17 |
| Chlorodibromomethane | 0.0032 | 0.0033 | 0.0031 | 2 | 0 |
| Chloroform | 0.011 | 0.03 | 0.0025 | 19 | 9 |
| Chloromethane | 0.0057 | 0.0057 | 0.0057 | 1 | 0 |
| Chromium (VI) | 0.00033 | 0.00033 | 0.00033 | 1 | 0 |
| Chromium, Total | 0.003 | 0.005 | 0.002 | 19 | 15 |

| INFLUENT - Pollutant | Average | Maximum | Minimum | Count | # <MDL |
|---|---|---|---|---|---|
| Copper, Total | 0.151 | 0.21 | 0.089 | 19 | 0 |
| Cyanide | 0.011 | 0.025 | 0.002 | 19 | 17 |
| Fluoride | 0.54 | 0.94 | 0.05 | 9 | 4 |
| Iron | 1.13 | 2.4 | 0.47 | 11 | 0 |
| Lead, Total | 0.0017 | 0.005 | 0.001 | 19 | 16 |
| Mercury, Total | 0.000068 | 0.00014 | 0.00005 | 19 | 11 |
| Molybdenum, Total | 0.007 | 0.011 | 0.005 | 10 | 9 |
| Nickel, Total | 0.006 | 0.014 | 0.005 | 19 | 17 |
| Nitrate+Nitrite | | | | | 0 |
| N-Nitroso-dimethylamine | 0.002003 | 0.005 | 4.7E-09 | 15 | 7 |
| N-Nitroso-N-propylamine | 0.010001 | 0.025 | 0.000000001 | 15 | 13 |
| Oil and Grease | 40 | 65 | 23 | 6 | 0 |
| Phenol | 0.012 | 0.016 | 0.01 | 7 | 3 |
| Phosphorus from additional POTW monitoring | 7.3 | 13 | 4 | 21 | 0 |
| Phosphorus from POTW DMR Monitoring (this data was used) | 8.6 | 24.0 | 0.3 | 959 | 0 |
| Phosphorus - Ortho | | | | | 0 |
| Selenium, Total | 0.0025 | 0.0028 | 0.0016 | 19 | 16 |
| Silver, Total | 0.0023 | 0.0025 | 0.0009 | 19 | 17 |
| TDS | 883 | 970 | 840 | 6 | 0 |
| Thallium | 0.0005 | 0.0005 | 0.0005 | 13 | 13 |
| TKN from additional POTW monitoring | 42 | 49 | 32 | 15 | 0 |
| TKN from POTW DMR Monitoring | 47 | 140 | 26.0 | 959 | 0 |
| Total Inorganic Nitrogen | | | | | 0 |
| Total Phenolics | 0.051 | 0.065 | 0.043 | 6 | 0 |
| TSS from additional POTW monitoring. | 320 | 420 | 210 | 21 | 0 |
| TSS from POTW DMR Monitoring – This data used and the 80th percentile value from this data was used for maximums (580 mg/L). | 495 | 1700 | 57 | 959 | 0 |
| Uranium | 0.0025 | 0.0025 | 0.0025 | 11 | 11 |
| Zinc, Total | 0.24 | 0.34 | 0.005 | 19 | 1 |

The pollutants in the following table are as mg/L and total unless otherwise specified. Pollutant data is from samples August 2014-July 2015. Data for conventional pollutants (DMR monitoring) represents and includes older data collected from January 1, 2013 to August 2015. Newer data is used except where noted.

| EFFLUENT - Pollutant | Average | Maximum | Minimum | Count | # <MDL |
|---|---|---|---|---|---|
| Flow (mgd) | 16.50 | 20.80 | 13.80 | 959 | 0 |
| 2,3,7,8-TCCD | 0.71E-9 | 9.74E-10 | 4.67E-10 | 10 | 10 |
| 2-Butanone (MEK) | 0.0084 | 0.046 | 0.0025 | 8 | 6 |
| 3&4-Methylphenol | 0.0146 | 0.045 | 0.00465 | 6 | 5 |
| 4-methyl-2-pentanone (MIBK) | 0.0025 | 0.0025 | 0.0025 | 8 | 8 |
| 4-Methylphenol (p-Cresol) | 0.0146 | 0.045 | 0.00465 | 6 | 5 |
| Acetone | 0.0419 | 0.2 | 0.0025 | 8 | 6 |
| Ammonia from additional POTW monitoring | 0.1842 | 0.53 | 0.07 | 22 | 0 |
| Ammonia from POTW DMR Monitoring (used this data) | 0.19 | 1.80 | 0.02 | 958 | 3 |
| Antimony | 0.0013 | 0.00125 | 0.00125 | 13 | 13 |
| Arsenic, Total | 0.0020 | 0.0025 | 0.0007 | 20 | 18 |
| Barium | 0.0757 | 0.093 | 0.066 | 7 | 0 |
| Benzyl Alcohol | | | | | 0 |
| Beryllium | 0.0005 | 0.001 | 0.0005 | 20 | 20 |
| bis(2-ethylhexyl)phthalate | 0.0096 | 0.0665 | 0.00465 | 18 | 17 |
| BOD5 from additional POTW monitoring | 1.8 | 3 | 1 | 22 | 22 |
| BOD5 from POTW DMR Monitoring | 3.09 | 14.00 | 2.00 | 955 | 903 |
| Boron | 0.2691 | 0.32 | 0.24 | 11 | 0 |
| Bromodichloromethane | 0.0084 | 0.014 | 0.0025 | 20 | 5 |
| Cadmium, Total | 0.0006 | 0.001 | 0.0005 | 20 | 20 |
| Chlorodibromomethane | 0.0027 | 0.0032 | 0.0025 | 4 | 2 |
| Chloroform | 0.0369 | 0.34 | 0.003 | 20 | 0 |
| Chloromethane | 0.0025 | 0.0025 | 0.0025 | 8 | 8 |
| Chromium, Total | 0.0026 | 0.005 | 0.0025 | 20 | 20 |
| Copper, Total | 0.0232 | 0.025 | 0.006 | 20 | 18 |
| Cyanide | 0.0077 | 0.025 | 0.0025 | 20 | 13 |
| Fluoride | 0.5767 | 0.9 | 0.1 | 9 | 3 |
| Iron | 0.0442 | 0.08 | 0.028 | 11 | 0 |
| Lead, Total | 0.0026 | 0.005 | 0.00125 | 20 | 20 |
| Mercury, Total | 0.0001 | 0.00005 | 0.00005 | 17 | 17 |

| EFFLUENT - Pollutant | Average | Maximum | Minimum | Count | # <MDL |
|---|---|---|---|---|---|
| Molybdenum, Total | 0.0065 | 0.01 | 0.005 | 10 | 10 |
| Nickel | 0.0056 | 0.011 | 0.005 | 20 | 19 |
| Nitrate+Nitrite from additional POTW monitoring | 4.8923 | 6 | 3.8 | 13 | 0 |
| Nitrate+Nitrite from POTW DMR Monitoring | 4.93 | 6.3 | 3.5 | 138 | 0 |
| N-Nitrosodimethylamine | 0.0098 | 0.0265 | 9.4E-09 | 16 | 8 |
| N-Nitroso-N-propylamine | 0.0031 | 0.025 | 0.000001 | 16 | 11 |
| Oil and Grease | 1.1286 | 1.7 | 0.7 | 7 | 0 |
| Phenol | 0.0120 | 0.012 | 0.012 | 1 | 0 |
| Phosphorus from additional POTW monitoring | 0.1559 | 0.78 | 0.05 | 22 | 5 |
| Phosphorus from POTW DMR Monitoring | 0.16 | 5.0 | 0.1 | 959 | 315 |
| Phosphorus - Ortho, Dissolved from additional POTW monitoring | 0.1313 | 0.38 | 0.05 | 15 | 4 |
| Phosphorus - Ortho, Dissolved from POTW DMR Monitoring | 0.15 | 5.9 | 0.1 | 958 | 344 |
| Selenium, Total | 0.0024 | 0.0025 | 0.0014 | 19 | 18 |
| Silver, Total | 0.0026 | 0.005 | 0.0025 | 20 | 20 |
| TDS from additional POTW monitoring | 886.5000 | 980 | 810 | 20 | 0 |
| TDS from POTW DMR Monitoring | 901 | 1100 | 440 | 140 | 0 |
| Thallium | 0.0005 | 0.0005 | 0.0005 | 13 | 13 |
| TKN | 0.9692 | 1.6 | 0.52 | 13 | 0 |
| TKN from POTW DMR Monitoring | 0.99 | 1.9 | 0.35 | 137 | 0 |
| Total Inorganic Nitrogen | 5.0846 | 6.2 | 4.3 | 13 | 0 |
| Total Inorganic Nitrogen from POTW DMR Monitoring | 5.10 | 6.4 | 4.0 | 138 | 0 |
| Total Phenolics (see Phenol) | | | | | |
| TSS from additional POTW monitoring | 0.9773 | 2 | 0.5 | 22 | 9 |
| TSS from POTW DMR Monitoring | 0.67 | 5.0 | 0.5 | 958 | 763 |
| Uranium | 0.0025 | 0.0025 | 0.0025 | 11 | 11 |
| Zinc, Total | 0.0580 | 0.088 | 0.005 | 20 | 1 |

The pollutants in the following table are as mg/L and total unless otherwise specified. Pollutant data is from samples November 2014 to September 2015.

| Domestic+Commercial - Pollutant | Average | Maximum | Minimum | Count | # <MDL | RLs by Lab |
|---|---|---|---|---|---|---|
| Ammonia | 27 | 29 | 26 | 7 | 0 | |
| Arsenic, Total | 0.0091 | 0.015 | 0.0022 | 15 | 14 | |
| Barium | 0.1329 | 0.16 | 0.12 | 7 | 0 | |
| Beryllium | 0.0005 | 0.0005 | 0.0005 | 7 | 7 | |
| Bis (2-ethylhexyl) phthalate | 0.0342 | 0.07 | 0.0047 | 7 | 3 | |
| BOD5 | 273 | 570 | 190 | 15 | 0 | |
| Bromodichloromethane | 0.0056 | 0.014 | 0.0025 | 7 | 4 | |
| Cadmium, Total | 0.0012 | 0.0023 | 0.0005 | 15 | 14 | |
| Chloroform | 0.0165 | 0.027 | 0.0029 | 6 | 0 | |
| Chromium, Total | 0.0025 | 0.0026 | 0.0025 | 15 | 14 | |
| Copper, Total | 0.0993 | 0.17 | 0.07 | 15 | 0 | |
| Cyanide | 0.0183 | 0.025 | 0.0004 | 7 | 5 | |
| Diethylphthalate | 0.0116 | 0.066 | 0.0025 | 7 | 6 | |
| Lead, Total | 0.0045 | 0.00725 | 0.00125 | 15 | 15 | |
| Mercury, Total | 0.000083 | 0.0001 | 0.00005 | 15 | 11 | |
| Nickel, Total | 0.0035 | 0.009 | 0.0025 | 15 | 11 | |
| Oil and Grease | 37.1429 | 51 | 25 | 7 | 0 | |
| Phenol | 0.0103 | 0.012 | 0.01 | 7 | 5 | |
| Phenols, Total | 0.0443 | 0.054 | 0.024 | 7 | 0 | |
| Phosphorus | 4.9333 | 6 | 3.9 | 15 | 0 | |
| Selenium, Total | 0.0145 | 0.025 | 0.002 | 15 | 13 | |
| Silver, Total | 0.0038 | 0.005 | 0.0025 | 15 | 15 | |
| TDS | 807.1 | 890 | 760 | 7 | 0 | |
| TSS | 151 | 236 | 98 | 15 | 0 | |
| Zinc, Total | 0.2180 | 0.41 | 0.15 | 15 | 0 | |
| 2-Butanone (MEK) | 0.0034 | 0.0054 | 0.0025 | 7 | 4 | |
| Acetone | 0.0612 | 0.4 | 0.0025 | 7 | 5 | |
| Chlorodibromomethane | 0.0026 | 0.0031 | 0.0025 | 7 | 5 | |
| 3&4 Methylphenol | 0.0588 | 0.1 | 0.0025 | 7 | 1 | |
| 4-Methylphenol | 0.0699 | 0.1 | 0.04 | 7 | 0 | |

## K. Analytical and Sampling Methods

1. Analytical Methods and Sample Preservation

All wastewater samples were collected, preserved and analyzed using methods approved pursuant to 40 CFR Part 136 and 40 CFR Part 403, Appendix E and were of such quality as to be legally defensible. The City uses a mix of in-house and external support for analytical work performed under its pretreatment program.

2. Sample Types

POTW influent and effluent samples were collected as required by the NPDES Permit. If sampling for oil and grease, cyanide, pH, sulfides, phenols or volatile organic compounds, the City would use grab samples.

3. Example Liquid Matrix Sampling Criteria

| Pollutant | Sample Type | Sample Hold Time | Sample Preservation |
|---|---|---|---|
| Arsenic | 24 hr Composite | 6 Months | $HNO_3$ to pH <2 |
| Biochemical Oxygen Demand (BOD5) | 24 hr Composite | 48 Hours | Cool to 6°C |
| Cadmium | 24 hr Composite | 6 Months | $HNO_3$ to pH <2 |
| Chromium (total) | 24 hr Composite | 6 Months | $HNO_3$ to pH <2 |
| Copper | 24 hr Composite | 6 Months | $HNO_3$ to pH <2 |
| Cyanide | Grab (for Pretreatment Required Sampling) | 14 Days | Cool to 6°C, 1:1 NaOH to pH >12 |
| Lead | 24 hr Composite | 6 Months | $HNO_3$ to pH <2 |
| Mercury | Grab | 28 Days<br>90 Days | $HNO_3$ to pH <2<br>5 mL/L 12N HCl or 5 mL/L BrCl |
| Molybdenum | 24 hr Composite | 6 Months | $HNO_3$ to pH <2 |
| Nickel | 24 hr Composite | 6 Months | $HNO_3$ to pH <2 |
| Phosphorus | Grab | 28 days | Cool to 6°C, 1:1 $H_2SO_4$ to pH <2 |
| Selenium | 24 hr Composite | 6 Months | Cool to 6°C, 1:1 $HNO_3$ to pH <2 |
| Silver | 24 hr Composite | 6 Months | $HNO_3$ to pH <2 |
| Total Suspended Solids (TSS) | 24 hr Composite | 7 Days | Cool to 6°C |
| Zinc | 24 hr Composite | 6 Months | $HNO_3$ to pH <2 |

4. Chain of Custody (COC)

All samples included a COC for sample identification (sample location) and tracking. COC information and records are maintained at the Water Reclamation Facility and the City. Quality Assurance/Quality Control for sampling is provided with each sample report by the contract laboratory.

## L. Recordkeeping

All records that are the basis for the local limits developed shall be maintained for at least three years beyond when the local limits are no longer implemented and enforced. The records will be kept at the Water Reclamation Facility as a hardcopy and/or in electronic (.pdf) format.



ED_002461_00010594-00030

# ATTACHMENT 1

# EXAMPLE CALCULATION AND FORMULAS

# Process and Formulas used in Calculating Allowable Headworks Loadings (from 2004 EPA Guidance) – Copper Example

1. Applicable Allowable Headworks Loadings (AHLs)

   Water Quality: $(8.345*(WQS*(Q_{recH2O} + Q_{POTW})-(Q_{recH2O} * C_{stream})))/(1-(R_{POTW}/100))$

WQS: Applicable Water Quality Standard (mg/L): Acute or Chronic as appropriate (see Page 17)
$Q_{recH2O}$: Receiving Water Low Flow (mgd): Acute or Chronic as appropriate. 0 mgd.
$Q_{POTW}$: POTW flow for local limits (mgd)
$C_{stream}$: Upstream Receiving Water Concentration (mg/L) if specified by State: N/A
$R_{POTW}$: Removal Efficiency for POTW (%). Typically, the Mean Removal Efficiency is used.

Water Quality (Acute) = (8.345 * 0.0517 mg/L * 17.3 mgd)))/(1-95/100)
= 149.277 lbs/day

Water Quality Chronic = (8.345 * 0.0306 mg/L * 17.3 mgd)))/(1-95/100)
= 88.3535 lbs/day

Livestock WQS = (8.345 * 0.5 mg/L*17.3 mgd)))/(1-95/100)
= 1443.685 lbs/day

Irrigation WQS = (8.345 * 0.2 mg/L*17.3 mgd)))/(1-95/100)
= 577.474 lbs/day

2. Determine MAHL (most stringent AHL) = 88.3535 lbs/day, chronic WQS.

3. Determine the Maximum Allowable Industrial Loading (MAIL)

   MAIL = MAHL * 1-SF/100 - Domestic+Commercial Loading

   MAIL = (88.3535 lbs/day * 0.9 – 11.982 lbs/day) = 67.536 lbs/day

4. Calculate the Uniform Concentration Local Limit (mg/L)

   (MAIL/(SIU + Permitted non-SIU Flow (mgd) * 8.345))

   67.536 lbs/day / (3.442 mgd * 8.345) = 2.35 mg/L

# Attachment 2
# Inhibition Values

In the event that inhibition would occur in the future, the following EPA inhibition thresholds (see Appendix G of the 2004 Local Limits Guidance) or other peer-reviewed inhibition thresholds listed below may be used in setting permit specific limits or a local limit. Where a specific pollutant is identified and the concentration that is causing inhibition is determined, that site specific pollutant data would be used for a permit specific limit or a local limit.

| Pollutant | Reported Range of Activated Sludge Inhibition Threshold Levels, mg/L |
|---|---|
| Ammonia | 480 |
| Arsenic | 0.1 |
| Cadmium | 1 - 10 |
| Chromium (VI) | 1 |
| Chromium (III) | 10 - 50 |
| Chromium (Total) | 1 - 100 |
| Copper | 1 |
| Cyanide | 0.1 - 5 |
| | 5 |
| Iodine | 10 |
| Lead | 1.0 - 5.0 |
| | 10 - 100 |
| Mercury | 0.1 - 1 |
| | 2.5 as Hg (II) |
| Nickel | 1.0 - 2.5 |
| | 5 |
| Sulfide | 25 -30 |
| Zinc | 0.3 - 5 |
| | 5 - 10 |
| Anthracene | 500 |
| Benzene | 100 - 500 |
| | 125 - 500 |
| 2-Chlorophenol | 5 |
| | 20 - 200 |
| 1,2 Dichlorobenzene | 5 |
| 1,3 Dichlorobenzene | 5 |
| 1,4 Dichlorobenzene | 5 |
| 2,4-Dichlorophenol | 64 |
| 2,4 Dimethylphenol | 40 - 200 |
| 2,4 Dinitrotoluene | 5 |
| 1,2-Diphenylhydrazine | 5 |
| Ethylbenzene | 200 |
| Hexachlorobenzene | 5 |
| Naphthalene | 500 |

| Pollutant | Reported Range of Activated Sludge Inhibition Threshold Levels, mg/L |
|---|---|
| | 500 |
| | 500 |
| Nitrobenzene | 30 - 500 |
| | 500 |
| | 500 |
| Pentachlorophenol | 0.95 |
| | 50 |
| | 75 - 150 |
| Phenanthrene | 500 |
| | 500 |
| Phenol | 50 - 200 |
| | 200 |
| | 200 |
| Toluene | 200 |
| 2,4,6 Trichlorophenol | 50 - 100 |
| Surfactants | 100 - 500 |

| Pollutant | Reported Range of Nitrification Inhibition Threshold Levels, mg/L |
|---|---|
| Arsenic | 1.5 |
| Cadmium | 5.2 |
| Chloride | 180 |
| Chromium (VI) | 1 - 10 [as $(CrO_4)^{2-}$] |
| Chromium (T) | 0.25 - 1.9 |
| | 1 - 100 |
| | (trickling filter) |
| Copper | 0.05 - 0.48 |
| Cyanide | 0.34 - 0.5 |
| Lead | 0.5 |
| Nickel | 0.25 - 0.5 |
| | 5 |
| Zinc | 0.08 - 0.5 |
| Chloroform | 10 |
| 2,4-Dichlorophenol | 64 |
| 2,4-Dinitrophenol | 150 |
| Phenol | 4 |
| | 4 - 10 |

| Pollutant | Reported Range of Anaerobic Digestion Inhibition Threshold Levels, mg/L |
|---|---|
| Ammonia | 1500 - 8000 |
| Arsenic | 1.6 |
| Cadmium | 20 |
| Chromium (III) | 130 |
| Chromium (VI) | 110 |
| Copper | 40 |
| Cyanide | 4 - 100 |
| | 1 - 4 |
| Lead | 340 |
| Nickel | 10 |
| | 136 |
| Silver | 13 - 65** |
| Sulfate | 500 - 1000 |
| Sulfide | 50 - 100 |
| Zinc | 400 |
| Acrylonitrile | 5 |
| | 5 |
| Carbon Tetrachloride | 2.9 - 159.4 |
| | 10 - 20 |
| | 2.0 |
| Chlorobenzene | 0.96 - 3 |
| | 0.96 |
| Chloroform | 1 |
| | 5 - 16 |
| | 10 - 16 |
| 1,2-Dichlorobenzene | 0.23 - 3.8 |
| | 0.23 |
| 1,4-Dichlorobenzene | 1.4 - 5.3 |
| | 1.4 |
| Methyl chloride | 3.3 - 536.4 |
| | 100 |
| Pentachlorophenol | 0.2 |
| | 0.2 - 1.8 |
| Tetrachloroethylene | 20 |
| Trichloroethylene | 1 - 20 |
| | 20 |
| | 20 |
| Trichlorofluoromethane | - |

* Total pollutant inhibition levels, unless otherwise indicated.
** Dissolved metal inhibition levels.

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