

ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM (AZPDES)

This document gives pertinent information concerning the reissuance of the AZPDES permit listed below. This facility is a groundwater treatment system and is considered to be a minor facility under the NPDES program. The discharge limitations contained in this permit will maintain the Water Quality Standards listed in Arizona Administrative Code (A.A.C.) R18-11-101 et. seq. This permit is proposed to be issued for a period of 5 years.

Permittee's Name:	Freescall Semiconductor, Inc.
Permittee's Mailing Address:	1300 N. Alma School Road MD CH290 / AZ50 Chandler, Arizona 85224
Facility Name:	56 th Street and Earll Drive WQARF Site Groundwater Treatment System
Facility Address or Location:	Located along the canal bank on the northeast side of the Salt River Project (SRP) Grand Canal, near 34 th Street and north of State Route Loop 202, Phoenix, Arizona
Contact Person: Phone / E-mail Address:	Jenn McCall (480) 814-4587 / jenn.mccall@nxp.com
AZPDES Permit Number:	AZ0025861
Inventory Number:	106170

I. STATUS OF PERMIT(S)	
AZPDES permit applied for:	Renewal
Date application received:	September 23, 2015
Date application was determined administratively complete:	November 11, 2015
Previous permit number (if different):	N/A
Previous permit expiration date:	March 24, 2016
56 th Street and Earll Drive Water Quality Assurance Revolving Fund (WQARF) Site Groundwater Treatment System (AZ0025861), operated by Freescall Semiconductor, Inc., was placed into service on November 1, 2013.	

The facility is located within the designated 100-year flood plain (Flood Control District of Maricopa County, 2015). Therefore, a 1-foot-high, above-grade retaining wall was constructed around the facility to provide for flood protection.

II. GENERAL FACILITY INFORMATION

Type of Facility:	Groundwater Treatment System
Estimated Discharge Flow:	0.54 to 0.72 mgd
County:	Maricopa
Treatment Processes:	The groundwater treatment system includes two groundwater extraction wells, DM-39 and DM-40, and an underground pipeline system (two 8-inch diameter below-ground force mains) to convey groundwater contaminated with trichloroethylene (TCE) from the two extraction wells to an above-ground groundwater treatment plant. The extraction well water is conveyed through particulate filters for screening and sediment removal. The flow of water is then combined in a pipeline and conveyed for treatment of volatile organic compounds (VOCs) by Granular Activated Carbon (GAC) adsorption. The treated water is then conveyed by an underground pipeline through an SRP flow meter vault structure (with sample port for treated water sampling) to the northeast bank of the Grand Canal. The treated water is discharged into the Grand Canal approximately 250 feet west of the treatment facility. The end of the discharge pipeline is capped with a flap valve that is generally flush with the canal lining. The Grand Canal is concrete lined in this section of Phoenix. The pipe extends slightly beyond the canal bank and discharges into the canal.
Nature of facility discharge:	Treated groundwater
Average flow per discharge:	The applicant indicates the combined average flow for the two extraction wells is 0.58 mgd.
Reuse / irrigation or other disposal method(s):	N/A
Continuous or intermittent discharge:	Intermittent
Discharge pattern summary:	The facility generally discharges 7 days per week from February through December. The treatment system and extraction wells shut down and no discharge occurs to the canal for approximately one month each year, typically in January when the Grand Canal is dried up in order for SRP to conduct annual routine maintenance. There were 549 days of discharge from November 1, 2013 to July 31, 2015 or 322 days of discharge from August 1, 2014 to July 31, 2015.

III. RECEIVING WATER

The State of Arizona has adopted water quality standards to protect the designated uses of its surface waters. Streams have been divided into segments and designated uses assigned to these segments. The water quality standards vary by designated use depending on the level of protection required to maintain that use.

Receiving Water:	SRP Grand Canal, a Phoenix Area Canal, below municipal water treatment plant (WTP) intakes and all other locations.
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River Basin:	Middle Gila
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Outfall Location:	Outfall 001: Township 1 N, Range 3 E, Section 1 Latitude 33° 27' 39" N, Longitude 112° 00' 32.6" W
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The outfall discharges to, or the discharge may reach, a surface water listed in Appendix B of A.A.C. Title 18, Chapter 11, Article 1.

Designated uses for the receiving water listed above:	Agricultural Irrigation (AgI) Agricultural Livestock watering (AgL)
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Is the receiving water on the 303(d) list?	No, and there are no TMDL issues associated.
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Given the uses stated above, the applicable narrative water quality standards are described in A.A.C. R18-11-108, and the applicable numeric water quality standards are listed in A.A.C. R18-11-109 and in Appendix A thereof. In developing AZPDES permits, the standards for all applicable designated uses are compared and limits that will protect for all applicable designated uses are developed based on the standards.

IV. DESCRIPTION OF DISCHARGE

Because the facility is in operation and discharges have occurred, discharge monitoring data are available. The following is the measured treated groundwater quality reported in the application.

Parameters	Units	Maximum Daily Discharge Concentration
Boron	µg/L	5,310
Arsenic	µg/L	12.7
Chromium, Total	µg/L	11
Zinc	µg/L	<5
Cadmium	µg/L	0.11
Lead	µg/L	0.33
Nitrate/Nitrite	mg/L	4.2
pH	S.U.	7.88

V. STATUS OF COMPLIANCE WITH THE EXISTING AZPDES PERMIT

Date of most recent inspection:	January 13, 2016; no potential violations were noted as a result of this inspection.
DMR files reviewed:	January 2013 through October 2015
Lab reports reviewed:	October 2013 through July 2015
Exceedances:	N/A
NOVs issued:	None
NOVs closed:	N/A
Compliance orders:	None

VI. PROPOSED PERMIT CHANGES

The following table lists the major changes from the previous permit in this draft permit.

Parameter	Existing Permit	Proposed permit	Reason for change
Selenium	Limited	Limits removed	Data submitted indicates no reasonable potential (RP) for an exceedance of a standard.
<u>Table 2.a</u> – Selected Metals and Trace Substances <u>Table 2.b</u> – Selected Volatile Organic Compounds (VOCs)	Discharge characterization	Discharge characterization removed	Parameters on these two tables either have no applicable standard or data submitted indicates no RP for an exceedance of a standard.

Anti-backsliding considerations – “Anti-backsliding” refers to statutory (Section 402(o) of the Clean Water Act) and regulatory (40 CFR 122.44(l)) requirements that prohibit the renewal, reissuance, or modification of an existing NPDES permit that contains discharge limits, permit conditions, or standards that are less stringent than those established in the previous permit. The rules and statutes do identify exceptions to these circumstances where backsliding is acceptable. This permit has been reviewed and drafted with consideration of anti-backsliding concerns.

Limits for selenium have been removed from the permit because evaluation of current data allows the conclusion that no RP for an exceedance of a standard exists.

This is considered allowable backsliding under 303(d)(4). The discharge limitations in the current permit for this parameter were based on state standards, the respective receiving waters are in attainment for this parameter and the revisions are consistent with antidegradation requirements. See Section XII for information regarding antidegradation requirements.

VII. DETERMINATION OF DISCHARGE LIMITATIONS and ASSESSMENT LEVELS

When determining what parameters need monitoring and / or limits included in the draft permit, both

technology-based and water quality-based criteria were compared and the more stringent criteria applied.

Technology-Based Limitations:

There are no promulgated technology-based limits for a treatment system such as the 56th Street and Earll Drive WQARF Site Groundwater Treatment System. However, it has been demonstrated that this technology allows for efficient removal of volatile organic compounds (VOCs), and the discharge can be sampled with low detection limits. Technology-based limits based on best professional judgement (BPJ) were set in the previous permit for the following parameters: chloroform, 1, 2-cis-dichloroethylene (c-DCE), tetrachloroethylene (PCE), toluene, and trichloroethylene (TCE). These parameters will remain limits in the renewal permit based on BPJ. These parameters have been detected in the groundwater. The proposed limits are based on Safe Drinking Water Act Maximum Contaminant Levels (MCLs) which are the clean-up levels routinely required for groundwater remediation projects of this type.

Numeric Water Quality Standards: As outlined in A.A.C. R18-11-109 and Appendix A:

Per 40 CFR 122.44(d)(1)(ii), (iii) and (iv), discharge limits must be included in the permit for parameters with “reasonable potential” (RP), that is, those known to be or expected to be present in the discharge at a level that could potentially cause any applicable numeric water quality standard to be exceeded. RP refers to the possibility, based on the statistical calculations using the data submitted, or consideration of other factors to determine whether the discharge may exceed the Water Quality Standards. The procedures used to determine RP are outlined in the *Technical Support Document for Water Quality-based Toxics Control (TSD)* (EPA/505/2-90-001). In most cases, the highest reported value for a parameter is multiplied by a factor (determined from the variability of the data and number of samples) to determine a “highest estimated value”. This value is then compared to the lowest applicable Water Quality Standard for the receiving water. If the value is greater than the standard, RP exists and a water quality-based effluent limitation (WQBEL) is required in the permit for that parameter. RP may also be determined from BPJ based on knowledge of the treatment facilities and other factors. The basis for the RP determination for each parameter with a WQBEL is shown in the table below.

The proposed permit limits were established using a methodology developed by EPA. Long Term Averages (LTA) were calculated for each designated use and the lowest LTA was used to calculate the average monthly limit (AML) and maximum daily limit (MDL) necessary to protect all uses. This methodology takes into account criteria, discharge variability, and the number of observations taken to determine compliance with the limit and is described in Chapter 5 of the TSD. Limits based on A&W criteria were developed using the “two-value steady state wasteload allocation” described on page 99 of the TSD. When the limit is based on human health criteria, the monthly average was set at the level of the applicable standard and a daily maximum limit was determined as specified in Section 5.4.4 of the TSD.

Mixing Zone: The limits for all parameters in the draft permit, except for boron, were determined without the use of a mixing zone. Arizona state water quality rules require that water quality standards be achieved without mixing zones unless the permittee applies for and is approved for a mixing zone. A mixing zone for boron was granted and established during the previous permit term. The boron mixing zone is being reestablished for the renewal permit term and the permit limits for this parameter will be applied at the edge of the mixing zone.

Whole Effluent Toxicity (WET): ADEQ no longer requires WET testing if the receiving water has no aquatic and wildlife designated uses. Although the narrative standard prohibiting the discharge of toxic pollutants applies to all discharges, the test species are not appropriate for these receiving waters and no alternative tests are readily available. Therefore, WET testing is not required in this permit, and Part III for WET testing is shown as “not applicable.”

Permit Limitations and Monitoring Requirements:

The table that follows summarizes the parameters that are limited in the permit and the rationale for that decision. Also included are the parameters that require monitoring without any limitations or that have not been included in the permit at all and the basis for those decisions. The corresponding monitoring requirements are shown for each parameter. In general, the regulatory basis for monitoring requirements is per 40 CFR §122.44(i) *Monitoring requirements*, and 40 CFR §122.48(b), *Required monitoring*; all of which have been adopted by reference in A.A.C. R18-9-A905, *AZPDES Program Standards*.

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement / Rationale (1)
Flow	---	---	---	---	---	Discharge flow is to be monitored on a continual basis using a flow meter.
Antimony	No applicable standard	0.25 µg/L	2	N/A	N/A	Monitoring not required.
Arsenic	200 µg/L/ AgL	12.7 µg/L	5	53.3 µg/L	No RP	Monitoring not required.
Barium	No applicable standard	32 µg/L	2	N/A	N/A	Monitoring not required.
Beryllium	No applicable standard	<0.2 µg/L	2	N/A	N/A	Monitoring not required.
Boron	1,000 µg/L/ AgI	5,310 µg/L	25	11,151 µg/L	RP Exists	Monitoring required 1x/month and a WQBEL remains in the permit. Samples shall be taken within the mixing zone approximately 1,400 feet downstream of the discharge point in the receiving water (Grand Canal) (2).
Cadmium	50 µg/L/ AgI and AgL	0.11 µg/L	5	0.46 µg/L	No RP	Monitoring not required.
Chlorine, Total Residual (TRC)	No applicable standard	No data	0	N/A	N/A	Monitoring not required.
Chromium III	No applicable standard	No data	0	N/A	N/A	Monitoring not required.
Chromium VI	No applicable standard	11 µg/L	2	N/A	N/A	Monitoring not required.
Chromium, total	1,000 µg/L/ AgI and AgL	11 µg/L	2	81.4 µg/L	No RP	Monitoring not required.
Copper	500 µg/L/ AgL	<10 µg/L	5	21 µg/L	No RP	Monitoring not required.
Cyanide	200 µg/L/ AgL	<50 µg/L	1	N/A	No RP (Based on BPJ)	Monitoring not required.
<i>E. coli</i>	No applicable standard	No data	0	N/A	N/A	Monitoring not required.
Hydrogen sulfide	No applicable standard	No data	0	N/A	N/A	Monitoring not required.
Iron	No applicable standard	<10 µg/L	2	N/A	N/A	Monitoring not required.
Lead	100 µg/L/ AgL	0.33 µg/L	5	1.39 µg/L	No RP	Monitoring not required.
Mercury	10 µg/L/ AgL	<0.2 µg/L	5	0.42 µg/L	No RP	Monitoring not required.

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement / Rationale (1)
Nickel	No applicable standard	2.9 µg/L	2	N/A	N/A	Monitoring not required.
Selenium	20 µg/L/ Agl	6.2 µg/L	22	14 µg/L	No RP	Monitoring not required.
Silver	No applicable standard	0.15 µg/L	2	N/A	N/A	Monitoring not required.
Thallium	No applicable standard	0.13 µg/L	2	N/A	N/A	Monitoring not required.
Zinc	10,000 µg/L/ Agl	<5 µg/L	2	18.5 µg/L	No RP	Monitoring not required.
Nutrients (Total Nitrogen and Total Phosphorus)	No applicable standards	No data	0	N/A	N/A	Monitoring not required.
Oil & Grease	No applicable standard	No data	0	N/A	N/A	Monitoring not required.
Chloroform	No applicable standard	1.4 µg/L	19	N/A	RP Exists (Based on BPJ)	Monitoring required 1x/month and a TBEL remains in the permit.
1,2-cis-Dichloroethylene (c-1,2-DCE)	No applicable standard	<1 µg/L	19	N/A	RP Exists (Based on BPJ)	Monitoring required 1x/month and a TBEL remains in the permit.
Tetrachloroethylene (PCE)	No applicable standard	<1 µg/L	19	N/A	RP Exists (Based on BPJ)	Monitoring required 1x/month and a TBEL remains in the permit.
Toluene	No applicable standard	<1 µg/L	19	N/A	RP Exists (Based on BPJ)	Monitoring required 1x/month and a TBEL remains in the permit.
Trichloroethylene (TCE)	No applicable standard	<1 µg/L	19	N/A	RP Exists (Based on BPJ)	Monitoring required 1x/month and a TBEL remains in the permit.
pH	Minimum: 6.5 S.U. / AgL Maximum: 9.0 S.U. / AgL A.A.C. R18-11-109(B)	7.88 S.U.	19	N/A	WQBEL or TBEL always applicable	pH to be monitored using a discrete sample of the discharge and a WQBEL is set in the permit. 40 CFR Part 136 specifies that grab samples must be collected for pH.
Whole Effluent Toxicity (WET)	No applicable standard	No Data	0	N/A	N/A	Monitoring not required.

Footnotes:

- (1) The monitoring frequencies are as specified in the permit.
- (2) Receiving water (Grand Canal) samples for boron shall be taken from the approximate midpoint of the 32nd Street Bridge over the Grand Canal, approximately 1,400 feet downstream of the discharge point within the mixing zone.

VIII. NARRATIVE WATER QUALITY STANDARDS
All narrative limitations in A.A.C. R18-11-108 that are applicable to the receiving water are included in Part I, Sections B and C of the draft permit.

IX. MONITORING AND REPORTING REQUIREMENTS (Part II of Permit)
Section 308 of the Clean Water Act and 40 CFR Part 122.44(i) require that monitoring be included in permits to determine compliance with discharge limitations. Additionally, monitoring may be required to gather data for future discharge limitations or to monitor discharge impacts on receiving water quality.

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility’s performance. Monitoring frequencies for some parameters may be reduced in second term permits if all monitoring requirements have been met and the limits or ALs for those parameters have not been exceeded during the first permit term.

Discrete (i.e., grab) samples are specified in the permit for all parameters. The quality of the discharge is not expected to be highly variable.

Monitoring locations are specified in the permit (Part I.A and Part I.D) in order to ensure that representative samples of the discharge are consistently obtained. Surface water (Grand Canal) monitoring for boron shall be conducted within the mixing zone as specified under Special Conditions (Part IV.A) of the proposed permit.

The requirements in the permit pertaining to Part II, Monitoring and Reporting, are included to ensure that the monitoring data submitted under this permit is accurate in accordance with 40 CFR 122.41(e). The permittee has the responsibility to determine that all data collected for purposes of this permit meet the requirements specified in this permit and is collected, analyzed, and properly reported to ADEQ.

The permit (Part II.A.2) requires the permittee to keep a Quality Assurance (QA) manual at the facility, describing sample collection and analysis processes; the required elements of the QA manual are outlined.

Reporting requirements for monitoring results are detailed in Part II, Sections B.1 and 2 of the permit, including completion and submittal of Discharge Monitoring Reports (DMRs) and AZPDES Flow Record forms. The permittee is responsible for conducting all required monitoring and reporting the results to ADEQ on DMRs or as otherwise specified in the permit.

Requirements for retention of monitoring records are detailed in Part II.D of the permit.

XI. SPECIAL CONDITIONS (Part IV in Permit)
Mixing Zone for Boron
A mixing zone for boron was granted during the previous permit term. The applicant has applied to renew the mixing zone for the renewal permit term. The permittee submitted a mixing zone application for boron with supporting documentation as per A.A.C. R18-11-114.B. Pursuant to A.A.C. R18-11-114.A, ADEQ has reviewed the application and re-approved the mixing zone for monitoring boron in the receiving water (Grand Canal). Monthly surface water samples for boron shall be taken from the approximate midpoint of the 32nd Street Bridge over the Grand Canal, approximately 1,400 feet downstream of the discharge point (at the downstream edge of the mixing zone).

Permit Reopener

This permit may be modified based on newly available information; to add conditions or limits to address demonstrated discharge toxicity; to implement any EPA-approved new Arizona water quality standard; or to re-evaluate reasonable potential (RP), if assessment levels in this permit are exceeded [A.A.C. R18-9-B906 and 40 CFR Part 122.62 (a) and (b)].

XII. ANTIDegradation

Antidegradation rules have been established under A.A.C. R18-11-107 to ensure that existing surface water quality is maintained and protected. The discharge from the 56th Street and Earll Drive WQARF Site Groundwater Treatment System will be to a canal which is subject to Tier 1 antidegradation protection. Discharge quality limitations and monitoring requirements have been established under the proposed permit to ensure that the discharge will meet the applicable water quality standards. As long as the permittee maintains consistent compliance with these provisions, the designated uses of the receiving water will be presumed protected, and the facility will be deemed to meet currently applicable antidegradation requirements under A.A.C. R18-11-107.

XIII. STANDARD CONDITIONS

Conditions applicable to all NPDES permits in accordance with 40 CFR, Part 122 are attached as an appendix to this permit.

XIV. ADMINISTRATIVE INFORMATION

Public Notice (A.A.C. R18-9-A907)

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft AZPDES permit or other significant action with respect to an AZPDES permit or application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit. This permit will be public noticed in a local newspaper after a pre-notice review by the applicant and other affected agencies.

Public Comment Period (A.A.C. R18-9-A908)

Rules require that permits be public noticed in a newspaper of general circulation within the area affected by the facility or activity and provide a minimum of 30 calendar days for interested parties to respond in writing to ADEQ. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

Public Hearing (A.A.C. R18-9-A908(B))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

EPA Review (A.A.C. R18-9-A908(C))

A copy of this draft permit and any revisions made to this draft as a result of public comments received will be sent to EPA Region 9 for review. If EPA objects to a provision of the draft, ADEQ will not issue the permit until the objection is resolved.

XV. ADDITIONAL INFORMATION

Additional information relating to this proposed permit may be obtained from:

Arizona Department of Environmental Quality
Water Quality Division – AZPDES Individual Permits Unit
Attn: Ramona Chomor
1110 West Washington Street – Mail Code 5415B-3
Phoenix, Arizona 85007

Or by contacting Ramona Chomor at (602) 771 – 4515 or by e-mail at rc7@azdeq.gov.

XVI. INFORMATION SOURCES

While developing discharge limitations, monitoring requirements, and special conditions for the draft permit, the following information sources were used:

1. AZPDES Permit Application Forms 1, 2C, and the Mixing Zone Application were received September 23, 2015, along with supporting data, facility diagram, and maps submitted by the applicant with the application forms.
2. ADEQ files on Freescale Semiconductor, Inc. – 56th Street and Earll Drive WQARF Site Groundwater Treatment System.
3. ADEQ Geographic Information System (GIS) Web site.
4. Arizona Administrative Code (AAC) Title 18, Chapter 11, Article 1, *Water Quality Standards for Surface Waters*, adopted January 31, 2009.
5. A.A.C. Title 18, Chapter 9, Article 9. *Arizona Pollutant Discharge Elimination System* rules.
6. Code of Federal Regulations (CFR) Title 40:
Part 122, *EPA Administered Permit Programs: The National Pollutant Discharge Elimination System*.
Part 124, *Procedures for Decision Making*.
7. EPA Technical Support Document for Water Quality-based Toxics Control dated March 1991.
8. U.S. EPA NPDES Permit Writers' Manual, September 2010.