Introduction

The Arizona Department of Environmental Quality (ADEQ) is providing this Sampling and Analysis Plan (SAP) template to assist facility owners / operators with meeting analytical monitoring requirements established in ADEQ’s 2019 Multi-Sector General Permit (MSGP). While a SAP must be developed if analytical monitoring is required, the use of this SAP template is not mandatory (permittees may develop their own SAP, but must ensure it includes of the requirements specified in the permit).

Whether you use this template or create your own SAP, please be sure to read and understand the MSGP, including Part 6, to ensure all SAP requirements are included. A copy of the MSGP is available from ADEQ’s website at asdeq.gov.

**Using the SAP Template**

Tips for completing the Template:

* **This Template is designed for use by all facilities covered under ADEQ’s MSGP, however:**
	+ **The Template is NOT tailored to your individual industrial sector. Depending on which industrial sector(s) you fall under (see Appendix C of the MSGP) and where your facility is located, you will need to address specific monitoring requirements outlined in Part 8 of the permit.**
	+ **The Template is NOT intended to capture all requirements set forth in a specific Total Maximum Daily Load (TMDL). If your facility discharges to an impaired water with a TMDL, you will need to reference the applicable TMDL Report for specific requirements. The TMDL is available on ADEQ’s website, or contact ADEQ Watershed Unit for assistance**.
* **Complete a SWPPP and this SAP *before* submitting your Notice of Intent (NOI) for permit coverage.**
* **Each section includes “instructions” and space for your facility’s specific information. You should read the instructions for each section before you complete that section.**
* **The Template was developed in *Microsoft Word* so that you can add tables and additional text. Some sections may require only a brief description while others may require several pages of explanation.**
* **To make it easier to complete, the Template generally uses blue text where the operator is expected to enter information.**

While ADEQ has made every effort to ensure the accuracy of all instructions and guidance contained in the Template, the actual obligations of regulated industrial facilities are determined by the relevant provisions of the MSGP, not by the Template. In the event of a conflict between the Template and any corresponding provision of the MSGP, the MSGP controls. ADEQ welcomes comments on the Template at any time and will consider those comments in any future revision of this document.

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Sampling and Analysis Plan

for:

Insert Facility Name

Insert Facility Address

Insert City, State, Zip Code

**Contact(s):**

Insert SAP Contact First/Last Name

Insert SAP Contact Telephone Number

Insert SAP Contact Email Address

Date:

**\_\_ \_\_/ \_\_ \_\_ /** **\_\_ \_\_ \_\_ \_\_**

Contents

Instructions:

* Right click on Table of Contents and select ‘Update Field’ 🡪’Update page numbers only’ to update page numbers once the SAP template has been completed with the facility’s specific information.

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# 1.0 Purpose and Objectives

This Sampling and Analysis Plan (SAP) has been prepared to meet the requirements of ADEQ’s MSGP 2019. The purpose of the SAP is to ensure sample collection, handling, and testing procedures are established and followed to produce quality data results.

Instructions:

* Fill in the blanks as appropriate.

There are multiple objectives for this plan:

* Establish sampling protocols and methods for stormwater monitoring and sampling, as required under the MSGP;
* Provide sampling locations for <facility name> , which are identified as <outfall name> , <outfall name> , and <outfall name> and are intended to monitor stormwater quality for discharges into <receiving water> and <receiving water> .
* Document sampling and analysis methods and equipment for collecting representative samples of stormwater that maximize resources.
* ***(Delete paragraph if not applicable)*** Provide a framework to compare sampling results from <facility name> to routine analytical monitoring action levels, effluent limitation guideline levels, Arizona Surface Water Quality Standards (SWQS), including any Total Maximum Daily Loads (TMDL) or Waste Load Allocations (WLA)>.

# 2.0 Recordkeeping Requirements

Instructions:

* Review the record keeping requirement applicable to the facility.

Records of monitoring information must include the results of each stormwater monitoring event (Sample Collection Form) and laboratory analyses, including all field calibration and maintenance records. All records will be documented and maintained with the SWPPP in accordance with Part 5.6 of the MSGP.

Monitoring data must be submitted on an electronic Discharge Monitoring Report (eDMR) via a myDEQ account within 30 days of receiving the laboratory analytical data. Copies of the analytical test results will be maintained with the facility records.

If there is no data for a specific wet season, the reporting through myDEQ is as follows:

Winter Wet due June 30th

Summer Wet due November 30th

# 3.0 Sampling Personnel

Instructions:

* Complete Table 1 by listing the personnel responsible for collecting, packing and shipping/delivering samples.

**Table 1 – Sampling Personnel**

|  |  |
| --- | --- |
| **Staff Names** | **Specific Responsibilities** |
| Insert name of SWPPP team member or position/title of person responsible for sampling | Insert explanation of responsibilities related to sampling |
| [Repeat as necessary] | [Repeat as necessary] |

# 4.0 Sampling Requirements

Instructions:

* Check boxes to indicate all monitoring required at facility
* Complete Table 2 (a,b,etc…) with information related to Outfall(s), Permit Value, SWQS or TMDL/ WLA
* Complete Table 3 with information related to monitoring parameters
* Copy and paste the table for each outfall as necessary
* Complete Table 4 with information related to QA/QC samples/blanks
* Complete Table 5 with information related to Additional Monitoring Required by ADEQ

***Check each type of monitoring required*** ***or exceptions taken*** based on industrial sector, activity, receiving water(s), or additional monitoring for ADEQ:

[ ]  Receiving water(s) of one or more outfalls are ephemeral and have reduced monitoring requirements

[ ]  One or more outfall(s) are claimed as being Substantially Similar in nature (documented in SWPPP)

[ ]  Facility is/has been maintained as Inactive/Unstaffed (documented in SWPPP)

[ ]  Routine Analytical Monitoring (RAM) (non-mining)

[ ]  General Analytical Monitoring (mining)

[ ]  Effluent Limitation Guidelines (ELG)

[ ]  Impaired Waters Monitoring without a TMDL

[ ]  Impaired Waters Monitoring with a TMDL

[ ]  Additional Monitoring Required by ADEQ (maintain official correspondence with SWPPP)

[ ]  Additional Monitoring completed by the permittee

**Description of Outfall(s)**

[ ]  A copy of the approved myDEQ Notice of Intent (NOI) Certificate is included and incorporates by reference the specific monitoring requirements determined by industrial sector activity (Routine or General Analytical), (ELG), receiving water(s) (Impaired/TMDL), and additional monitoring required by ADEQ. The attached NOI certificate serves as a summary of monitoring requirements at each outfall (Table 2).

Narrative Description of Outfall ***(Use one table below for each outfall. Copy and paste the table as necessary)***.

[Repeat as necessary]

**Table 2 – Summary of Outfalls**

|  |  |  |  |
| --- | --- | --- | --- |
| **Outfall Name** | **Parameter** | **Permit Value, Action Limit, SWQS, TMDL/ WLA** | **Frequency** |
| Outfall (e.g. OF-1) | Parameter analyzed | Permit Value | Frequency |
| [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] |

**Water Quality Monitoring Parameters**

Complete Table 3 with the sampling requirements for each analyte.

**Table 3 – Sample Requirements**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Analytical Method** | **Target RL** | **Volume of Sample Container** | **Type of Preservative** | **Type of Bottle** | **Holding Time** |
| Parameter analyzed | Method | Target RL | Volume | Preservation | Type of Bottle | Holding Time |
| [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] |

**Quality Assurance/Quality Control Procedures**

Complete in Table 4 when and how any of the following Quality Assurance/Quality Control (QA/QC) samples will be used:

**Table 4 – Quality Control Procedures**

|  |  |  |
| --- | --- | --- |
| **QC Method** | **Frequency** | **Specific Use** |
| Field Blank | Frequency | specific use |
| Trip Blank | Frequency | specific use |
| Split/Duplicate Samples | Frequency | specific use |
| Matrix Spikes | Frequency | specific use |
| Background Samples | Frequency | specific use |
| Temperature Blanks | Frequency | specific use |
| Rinsate Sample | Frequency | specific use |

**Additional Monitoring Parameters Required by ADEQ**

***(Delete paragraph and Table if not applicable)*** In addition to the parameters listed in Table 1, ADEQ has specifically requested monitoring for the following additional analytes (Table 5.1):

**Table 5.1 – Summary of Additional Monitoring Required by ADEQ**

|  |  |  |  |
| --- | --- | --- | --- |
| **Outfall/ Receiving Water** | **Parameter** | **Permit Value, Action Level, SWQS, ELG, TMDL/ WLA** | **Frequency** |
| Outfall (e.g. OF-1) | Parameter analyzed | Permit Value | Frequency |
| [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] |

**Additional Monitoring completed by Permittee**

***(Delete paragraph and Table if not applicable)*** In addition to the parameters listed in Table 1, the permittee additionally completed monitoring for the following analytes (Table 5.2):

**Table 5.2 – Summary of Additional Monitoring completed by Permittee**

|  |  |  |  |
| --- | --- | --- | --- |
| **Outfall/ Receiving Water** | **Parameter** | **Permit Value, Action Level, SWQS, ELG, TMDL/ WLA** | **Frequency** |
| Outfall (e.g. OF-1) | Parameter analyzed | Permit Value | Frequency |
| [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] | [Repeat as necessary] |

# 5.0 Analytical Methods and Laboratories

**Instructions:**

* Information and procedures related to determining Hardness
* Procedure for comparing monitoring results to WLA in TMDL

Other than parameters required to be sampled at the time of sample collection (e.g. field parameters), ***all samples shall be analyzed by a laboratory that is licensed by the Arizona Department of Health Service (ADHS) Office of Laboratory Licensure and Certification.*** Identification of the analytical methods and related limits of detection (if applicable) for each parameter is required. ***The samples shall be analyzed using analytical methods with a limit of quantitation (LOQ) that is at or below the routine analytical concentrations, ELGs or other criteria specified in this permit.*** If all methods have LOQs higher than the specific criteria, the samples shall be analyzed using the analytical method with the lowest LOQ.

***All laboratory analyses shall be conducted according to test procedures specified in 40 CFR 136, unless other test procedures have been specified in this general permit.*** This requirement does not apply to parameters that require analysis at the time of sample collection as long as the testing methods used are approved by ADHS. The permittee may conduct field analysis of turbidity if the permittee has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to properly perform the field analysis.

**NOTE:** *Reporting limits and sample results should be reported to the number of significant figures available or required on the e-DMR generated by myDEQ.*

**Hardness**

The values (action level and SWQS) of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the ***receiving water*** or have the laboratory analyze the hardness of the ***stormwater sample*** in accordance with Part 6.2.1. The harness value would then be inserted into a formula provided for the specific metal and designated use in A.A.C. R18-11, Appendix A, Tables 2 through Table 9.

***Surface water data collected by a third party for hardness*** (provided the data is credible, scientifically defensible and is representative of current site conditions) is acceptable to use, and should be thoroughly documented in the SWPPP. The permittee shall retain all reports and monitoring data in accordance with Part 7.4 of the permit.

A hardness calculator (Microsoft Excel Spreadsheet) is available to calculate the value (action level or SWQS) to use depending on the specific metal and designated use of the receiving water: <http://www.azdeq.gov/node/525>. To use the spreadsheet, input the hardness value into the field named “Enter Hardness Value (mg/L).” The values (action level or SWQS) will automatically calculate based on the entered hardness value. The e-DMR entered through myDEQ will also calculate the action level or SWQS when the hardness is entered into the e-DMR for a specific metals.

***To determine the Designated Use of the receiving water(s)***:

1. Access eMaps here: <http://gisweb.azdeq.gov/arcgis/emaps/?topic=assessed>
2. Under Water Quality, Select Streams – Designated Use layer to make it visible
3. Click on the layer to select it (turns **bold**)
4. Click on Identify tool along the top, and
5. Click on the water body line feature to see its attributes
6. Values will either be ‘Null’ (No) or ‘Y’ for Yes. This is the Designated Use of that specific receiving water.

Reported results must be suitable for comparison to Arizona SWQS established in Arizona Administrative Code (A.A.C.) R18-11 Article 1.

**Total Maximum Daily Load**

***(Delete paragraph if not applicable)*** If applicable to <facility name> , once the analytical results have been received, they will be compared to the applicable WLAs in the approved TMDL. Include a copy of each TMDL applicable to facility’s stormwater discharges. Approved (and draft) TMDLs can be found here: <http://www.azdeq.gov/node/664>.

# 6.0 Laboratory Information

**Instructions:**

* Complete the Table with information for the laboratory that will be used by the facility to analyze samples

**Table 6 - Laboratory Information**

|  |  |
| --- | --- |
| Name of Laboratory | **POC:** Name |
| Phone Number | Email Address |
| Street Address  |
| City, State, Zip |

# 7.0 Sampling Procedures

**Instructions:**

Include procedures for the sample collection process: from sample collection to getting the samples to the lab

**Event Planning and Preparation**

Enter Description

Some required sampling materials include ***(check those that apply, add items as necessary)***:

|  |  |
| --- | --- |
| [ ]  Sample Collection Form(s) for each outfalls | [ ]  Sample containers for each outfall |
| [ ]  Cooler(s) | [ ]  A temperature blank for each cooler |
| [ ]  Chain-of-Custody (COC) forms and seals | [ ]  Field preservation supplies (ice, lab-supplied chemicals). |
| [ ]  Enter Description | [ ]  Enter Description |

**Access**

Access to the stormwater sampling location(s) is Enter Description (e.g. accessible, restricted, 4x4 vehicle, requires a key, etc.).

**Calibration and Maintenance of Monitoring Equipment and Instrumentation**

All monitoring instruments and equipment (including the field instruments for measuring pH and turbidity) shall be calibrated and maintained in accordance with the manufacturer's recommendations. Calibration procedures are as follows: Enter Description

Calibration of the instruments will occur (enter a specific time prior to sample collection) Enter Description.

The preferred manufacturer(s) and instrument(s) for the collection of field parameters (pH, temperature, turbidity, and specific conductance) is/are:

* Enter Description
* [Repeat as necessary]

**Monitoring Equipment and Instrumentation**

List equipment and instrumentation and describe the procedures for collecting data from them.

* Enter Description
* [Repeat as necessary]

**Sample Collection and Handling Procedures**

All required monitoring will be performed on a storm event that results in a discharge from the outfall ("measurable storm event") and collected within the first 30 minutes of the first flush runoff flow. This storm event must follow the preceding measurable storm event by at least 72 hours (3 calendar days). The 72-hour (3 day) storm interval does not apply if <facility name> is able to document that less than a 72-hour interval is representative for local storm events during the sampling period.

Any missed monitoring events will be documented in the SWPPP by (e.g. entering in a table with an explanation, documented in a particular section) Enter Description.

**Field Documentation**

The following information will be recorded in a field notebook, on a sampling form (template Sample Collection form included, one form for each outfall’s sampling event), or Enter Description during collection of samples:

|  |  |
| --- | --- |
| * Names of personnel participating in event
 | * Sample location and description (outfall or other)
 |
| * Description of weather conditions
 | * Date and time of sample collection
 |
| * Estimated duration (in hours) of the rainfall event
 | * Type of sample (grab, discrete, manual, auto sampler)
 |
| * Estimated rainfall total (in inches) for that rainfall event and source
 | * Observations of sampling procedures and conditions at the time of sampling
 |
| * Date of the previous measurable storm event
 | * Field observations and description of problems encountered or changes made from the plan
 |
| * Field instrument calibration information
 | * Sample identification name
 |
| * Field parameter measurements (see partial list below)
 | * Field observations relevant to sample integrity
 |
| * Estimated rainfall/storm duration
 | * Rainfall measurement in inches
 |
| * (optional) Stream flow
 | * QC samples and sample names if taken for the event
 |
| * Field filtration methods used
 | * Enter Description
 |

***(Delete paragraph and table if not applicable)*** The following field parameters will be measured and recorded at the time of sample collection ***(Check all that apply, Add/Delete field parameters/data as required)***:

|  |  |  |
| --- | --- | --- |
| [ ]  Sample Temperature | [ ]  Electrical Conductivity | [ ]  pH |

**Event First Flush or Flow-weighted Composite Samples**

The MSGP requires collecting a minimum of one grab sample from a discharge resulting from a measurable storm event that produces a sufficient volume to allow collection of a sample. Samples must be collected within the first 30 minutes of a measurable storm event. If it is not possible to collect within the first 30 minutes of a measurable storm event, the sample must be collected as soon as practicable after the first 30 minutes and within 24 hours of the measurable storm event. If the sample could not be collected within the first 30 minutes, include an explanation why it was not possible in the SWPPP.

New to the latest MSGP, is the ability to collected flow-weighted samples for stormwater. Flow-weighted composite samples for a stormwater discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots (sample portions) taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes. For flow-weighted samples, only one analysis of the composite of aliquots is required. Flow-weighted sampling protocol is adapted from 40 CFR 122.21 (individual permit application requirements for industrial stormwater permits). Note – analysis of the following parameters must be from discrete (not composite) samples: pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, and fecal coliform.

**Sample Container Labeling**

Each sample should be assigned a unique identifier by the sampling team. The unique identifier may consist of the sample location name (e.g. Outfall #1 or Outfall #2) followed by a date suffix such as YYMMDD. The unique identifier will be recorded on the COC form and the sample container. Provide the unique identifier ***format*** here: Enter Description.

Each container in the sample must be labeled with the unique identifier as well as the following minimum information:

|  |  |  |
| --- | --- | --- |
| * Sampler initials
 | * Sample collection date
 | * Sample collection time
 |

The laboratory will provide labels to be placed on each of the sample containers. The laboratory ***may*** affix the labels in advance. **Self-adhesive labels will be secured to each sample container. *Samples should be immediately placed on ice for transport to the designated lab.***

**Sample Container Preservation**

Procedures necessary to properly preserve samples will be provided by the laboratory contracted to perform sample analysis. Include the procedures here: Enter Description.

***NOTE:*** *There are techniques that can be used if a longer hold time is necessary than the 24 hours unpreserved samples permit. An option would be to acquire laboratory-supplied bottles with preservatives to use in the field. For total metals, samples can be placed directly in sample bottles with preservatives (HNO3) and hold time is increased to 6 months. Dissolved metals must be field filtered before being placed in bottles containing preservatives in order to increase hold time to 6 months. Extending hold times can be helpful when you cannot deliver the samples to the laboratory within 24 hours. In addition to preservatives, samples are placed on ice and maintained at a temperature of four degrees Celsius.*

**Sample Preparation and Transport**

Specific procedures and instruction for proper sample cooler packing and transport are critical in maintaining sample integrity. The following section contains guidelines for sample packaging and transport.

The following procedures will be used when preparing the sample cooler(s) for shipment or delivery to the laboratory:

|  |  |
| --- | --- |
| * All labels remaining on the exterior of the cooler will be removed
 | * Sample bottles will be packaged per manufacturer and lab instructions to prevent breakage during shipment;
 |
| * A temperature blank will be placed in the cooler (if provided or available)
 | * All ice will be bagged in zip-locked plastic bags (confirm with specific lab)
 |

When placing the samples in the cooler, ensure that the COC form is in a sealed watertight bag taped to the inside of the lid. Sample coolers will be transported to the certified laboratory Enter Description (e.g. by the sampler or via courier).

**Relinquishment**

The assigned Stormwater Team Member Enter Description will sign over the COC form to the receiving entity (e.g. laboratory personnel or courier) Enter Description, and the COC form will be signed and dated with the time of relinquishment.

Once the cooler(s) is/are delivered to the laboratory, the cooler’s contents will be checked against information on the COC form. The condition, temperature, and appropriate preservation of samples will be checked and documented on the COC form by the lab. Any discrepancies between the COC and the sample conditions at the time of delivery to the laboratory will be communicated to the Stormwater Team Manager for proper resolution and documented in laboratory records.

**Receipt and Review of Lab Results**

The lab’s results report will generally be delivered to the Facility’s assigned POC who will either disseminate or evaluate the results report. Following evaluation of the results report, refer to the SWPPP for the appropriate response or follow-up action.

|  |
| --- |
| **Facility Sample Information** |
| Facility Name: | Name of Facility | AZPDES Auth. No. | Insert Authorization No. |
| Outfall Name: Name | "Substantially Similar Discharge Point"? | [ ]  Yes [ ]  No (identify substantially identical outfalls): |
| Person(s)/Title(s) collecting sample: Name/Title |
| Person(s)/Title(s) assisting with sample: Name/Title |
| Date & Time Discharge Began: Enter date and time | Date & Time Sample Collected: Enter date and time  | If sample not taken within first 30 minutes, explain why: explanation |
| Unique Sample Identifier (Matches Identifier on COC)  | Sample Identifier |
| Substitute Sample? | [ ]  No [ ]  Yes (identify quarter/year when sample was originally scheduled to be collected): |
| Nature of Discharge: [ ]  Rainfall [ ]  Snowmelt |
| Rainfall Amount: No of inches\_ | Previous Storm Ended > 72 hours Before Start of This Storm? | [ ]  Yes [ ]  No\* (explain): |
| **Field Sampling Data** |
| Type of Sample | [ ]  Grab [ ]  Discrete [ ]  Manual [ ]  Auto sampler (Date/Time Collected) [ ]  Flow-weighted continuous [ ]  Flow-weighted combination **For flow-weighted, answer questions below**Duration of Storm: Insert details Number of SubSamples: Insert details Time between samples: Insert details |
| Field Parameter Measurements | pH: pH  | Temperature: temperature | Conductivity: conductivity | Turbidity: turbidity | Flow Rate: rate |
| Field Filtration Methods | Insert details |
| QC Samples  | Insert details |
| Field Instrument Calibration Data | Insert details |
| Indicators of Stormwater Pollution Observed? | [ ]  No [ ]  Yes (Describe): Insert details |
| **Observations of sampling procedures and conditions at the time of sampling:** Insert details |
| \* The 72-hour interval can be waived when the previous storm did not yield a measurable discharge or if you are able to document (attach applicable documentation) that less than a 72-hour interval is representative of local storm events during the sampling period. |
| **Description of problems encountered or deviations made from the Sampling and Analysis Plan:** Insert details |
| **Certification Statement (Refer to MSGP Appendix B, Paragraph 9, for Signatory Requirements)** |
| “I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.” |
| A. Name:  | name | B. Title:  | title |
| C. Signature: |  | D. Date Signed: | Insert details |