YOUR NAME HERE

Harvested Rainwater Standard Operating Procedures		
SOP#	Version #	Author:
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Harvested Rainwater Standard Operating Procedures

PURPOSE:

This section should document the purpose of the Standard Operating Procedure (SOP). It could be a few simple sentences. Note: All sections below will include *italicized* examples for you to consider when writing your SOP.

Our school would like to use our garden produce in our cafeteria. The purpose of this SOP is to achieve compliance with the Arizona Department of Health Services (ADHS) School Garden Program that requires an SOP in order to use our school garden produce, which uses harvested rainwater for irrigation purposes, in the cafeteria.

INTRODUCTION:

In order for our school garden to use the produce from our school garden in the cafeteria, the ADHS School Garden Program requires an SOP when we use harvested rainwater for irrigation purposes. This SOP will provide step by step procedures on how our school harvests rainwater for irrigation.

DEFINITIONS and ABBREVIATIONS:

ADHS: Arizona Department of Health Services

Cistern: A closed container that catches and holds rainwater and is sometimes stored underground.

First Flush: Method used to divert the initial flow of rainwater, which can contain excess debris and contaminants.

Good Rainwater Harvesting Guidelines: Guidelines that have been put forth by subject matter experts and/or organizations, including those listed in the References portion of this document. These guidelines include acceptable roof design and construction; roof construction material safety; construction and location of the cistern; first flush parameters; prevention of mosquito breeding; design and installation of clean outs; and spigot locations.

Mosquito Dunks: A licensed product used to kill mosquito larvae.

Rain Barrel: A barrel placed so as to catch rain water.

Safe Drinking Water Act: An act used to regulate biological and chemical contaminates in water to ensure water is safe to drink.

Sanitized: The third step in the cleaning process, after cleaning with hot water and soap and rinsing with hot water, that includes either a bleach solution of 50-100 ppm or quaternary ammonia solution of 200 ppm (or per manufacture specifications).

US EPA Recreational Water Quality Standards: United States Environmental Protection Agency Recreational Water Quality Standards that provide limits on pathogen levels in water used to irrigate produce.

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Well-designed Rainwater Harvesting System: A system that follows the guidelines put forth by subject matter experts and/or organizations, including those listed in the References portion of this document. A well designed system must be designed, constructed, and installed in a manner that prevents organic matter, microorganisms and chemical contaminants from entering the water system by using preventative measures that include, at minimum, screens; filters; a first flush system; a cistern that meets NSF/ANSI Standard 61 requirements; the exclusion of chemicals, paints or coatings on the interior of the system; verifying that the roof is made of approved materials; designed with a cleanout pipe; and painting the exterior of the cistern to prevent sunlight and algae growth.

POLICY:

Our policy will be to document the following for harvesting rainwater:

Location:

- *Cistern will be placed upslope and in a well-drained area that is not subject to flooding;*
- *All on-site utilities will be located before digging;*
- *Cistern will not be connected to the sewer system; and*
- *Cistern will be placed on a solid foundation.*

Material, Construction and Treatment:

1. *Roof material and size:*
   - *Roof is made of concrete tile;*
   - *Roof is over 2,000 square feet;*
   - *Roof has not been treated with any chemicals, paints, or coatings;*
   - *Gutters are made with non- toxic construction materials, paints, copper, or coatings; and*
   - *Roof is smooth and does not have asphalt or shingles.*
2. *Cistern Construction:*
   - *Cistern will be designed to meet the NSF/ANSI Standard 61 and sealed with a material meeting food-grade or water potability standards;*
   - *Cistern will have a metal filter to minimize the entry of organic matter and microorganisms from entering it;*
   - *All inlets and outlets will be screened to prevent mosquito breeding;*
   - *Our first flush device will divert a minimum of 20 gallons;*
   - *The hose spigot is located 4-6 inches above the ground;*
   - *Our overflow pipe will be equipped with a screen and designed to carry excess water to our flower garden;*
   - *Our cleanout pipe, measuring 2 inches in diameter, will be equipped with a ball value to allow opening and closing and is connected to the overflow pipe to allow easy draining;*
   - *Our cistern will be painted opaque to prevent sunlight and algae growth; and*
   - *Our cistern will be labeled "do not drink the water".*

3. *Treatment*
    - *According to the definition for a well-designed rainwater harvesting system, our system is well-designed; therefore, we will not be testing for contaminants. In addition, we will only be using harvested rainwater for direct soil irrigation on our crops.*

Hygienic Practices and Associated Documentation:

- *Our cistern will be cleaned at least annually and the dates and initials of the person who cleaned it will be written in the cleaning log;*
- *When cleaning, the cistern will be emptied and then washed with a non-toxic cleaner*
- *We will remove excessive leaves from the roof and gutters;*
- *We will clean filters regularly; and*
- *We will not use harvested rainwater for hand washing or drinking purposes.*

Compliance:

- *We will verify that our local and state laws do not require a permit for harvesting rainwater;*
- *All logs will be available to the ADHS School Garden Sanitarian during inspections (see Safety and Quality Control for a list of logs); and*
- *All records and logs will be maintained for at least two years.*

Educational Purposes:

- *We will log the quantity of rainwater harvested on a weekly basis.*

SCOPE and RESPONSIBILITIES:

The School Garden Manager will ensure compliance with this policy by creating and maintaining logs. These logs will be made available to the ADHS School Garden Sanitarian during inspections.

SAFETY and QUALITY CONTROL:

The School Garden Manager will create and maintain logs for at least 2 years that document:

- *Dates of each rainfall event;*
- *Each date the first flush device is emptied of rainwater (immediately after each rainfall event);*
- *Dates of regular roof maintenance to prevent organic/inorganic contamination and water pooling on roof;*
- *Each date filters are cleaned, repaired, or replaced;*
- *Each date cistern is cleaned and sanitized (with initials of the person who cleaned it); and*
- *Date of each annual inspection.*

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MATERIALS, REAGENTS, and EQUIPMENT:

The following items are required in order to comply with this SOP:

- *Designated tools strictly to be used for rainwater harvesting purposes only;*
- *Tools needed to remove leaves from roof (ladder, spray hose, etc.); and*
- *Extra filters.*

SPECIAL NOTES:

This section is for anything you want to note that has not already been addressed.

PROCEDURE:

A cistern will be installed that meets the parameters of the design noted in this document. Water will be applied via drip irrigation four times a week on a timer system. We will conduct monthly maintenance on the roof to ensure there are no obstructions and we will clean, repair, or replace any filters during these monthly maintenance inspections.

CORRECTIVE ACTIONS:

If the system has broken down, then we will stop drip irrigation until the system is repaired and/or we tested the water to ensure it met the US EPA Recreational Water Quality Standards. If an overflow is found in our system that could potentially flood our garden, then we will dig an overflow trench to direct water away from the area. If we do not have fine screening, then we will use Mosquito Dunks to minimize the mosquito population until the fine screening material is available.

REFERENCES:

Community Food Bank of Southern Arizona Rainwater Harvesting Guidelines:
http://communityfoodbank.com/programs-services/alphabetical-list/farm-to-child/

EPA Rainwater Harvesting Policies:
http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_harvesting.pdf

Safe Drinking Water Act:
http://water.epa.gov/lawsregs/rulesregs/sdwa/index.cfm

The Texas Manual on Rainwater Harvesting:
http://www.ecy.wa.gov/programs/wr/hq/pdf/texas_rw_harvestmanual_3rdedition.pdf

US EPA Recreational Water Quality Standards:
http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/index.cfm

U.S. Food and Drug Administration. Fact Sheets on Subparts of the FSMA Proposed Rule for Produce Safety:
http://www.fda.gov/downloads/Food/GuidanceRegulation/FSMA/UCM360242.pdf

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APPENDIX:

This Section can be used for items such as:

- Log templates
- Copy of application
- Any additional documents created

Annual School Review by: _____ Date Reviewed: _____

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