Key for Seattle Public Schools only

Water Assessment and Audit

School Name: _____ Date: _____

Conducted By:

_____ _____ _____

_____ _____ _____

_____ _____ _____

Congratulations on completing Step 1 by forming your Green Team!

Step 2: Assess

Complete this Water Assessment and Audit to learn more about the current water conservation and quality practices at your school, and to help your Green Team choose a Lasting Change. Use the *Indoor Water Audit Worksheet* (attached and/or downloadable excel sheet) and the *Water Assessment Guide* to assist you in filling out the following questions. You will need to enter some of your answers into the Key Findings section of your online report card. (*These questions are marked with a star ★.)*

Support

1. Does your school district have a Resource Conservation Manager (RCM)? ☑ Yes ☐ No
   Name go to http://bit.ly/sps-conservation for contact information
   If so, consider setting up an interview. RCMs work at the district level to help schools conserve resources and save money.

2. Do you have water educators or access to technical assistance for water related issues in your community?
   ☑ Yes ☐ No

   If yes, list their name(s), agencies, and contact info:
   Technical Assistance = Nicole Laky, Seattle Schools Phone #: 206-252-0599
   Educators = see page 9 Phone #: _____

3. Some water management facilities can be used visited for field trips. Which can be used in your community? see page 9 for more info

Local stream or watershed	☑ Yes	☐ No	Location: see page 9
Pump station	☑ Yes	☐ No	Location: see page 9
Drinking water treatment plant	☑ Yes	☐ No	Location: see page 9
Wastewater treatment plant	☑ Yes	☐ No	Location: see page 9
Storm water detention pond	☑ Yes	☐ No	Location: see page 9

General

4. ★ In what watershed is your school located? http://www.kingcounty.gov/environment/watersheds.aspx

5. What is the annual precipitation where your school is located? (in inches)
   http://www.seattle.gov/html/weather_averages.htm

6. ★ What is the source of your school's water supply?
   ☑ Municipal water supply ☐ School has own well

7. If your water comes from a municipal supply, what is its source?
   ☐ Well (groundwater) ☑ Lake or river (surface water)

8. ★ Where does wastewater from your school go?
   ☑ Municipal sewer system ☐ On-site septic system and drainage field

9. Is water conservation or water quality part of your school's curriculum?
   ☐ Yes ☐ No
   If yes, please describe_____
   _____

Water Quantity Issues

10. If your drinking water comes from a private well, is it metered so that water use can be monitored?
    ☐ Yes ☐ No

11. Does your school have a rainwater collection system, such as cisterns or rain barrels, for rainwater re-use?
    □ Yes □ No

12. ★ Fill out the table below by answering the following questions: See attachment "A"
    - In what month are you completing this assessment?
    - How much water did your school use this month? (Provide both gallons and ft^3 per month; 1 ft^3 = 7.48 gallons).
    - How much did this water cost per student? ($/student/month)

Month: _____	# of students in school: _____
Amount of Water Used:	_____ ft^3 / student/ month _____ gallons/ student/ month
Cost	_____ $/ student/ month

13. Does your school have a cafeteria? ☐ Yes ☐ No
    If so, does the cafeteria have a water-efficient dishwasher? "water efficient" dishwashers are EnergyStar qualified and will have an EnergyStar label on them (check the side of the machine or near the model number tag). Also check for efficient food steamers and ice machines.
    ☐ Yes ☐ No
    Does it have an efficient pre-rinse spray nozzle (to spray off dishes before they go into the dishwasher)? "efficient pre-rinse spray nozzles" typically have only one hole where water is sprayed in a fan pattern, not several holes like a showerhead. Flow of 1.6 gallons per minute or less is considered efficient. You can measure the flow rate manually by using the instructions below.
    ☐ Yes ☐ No

Water Assessment and Audit

14. Does your school have a swimming pool?

☐ Yes ☑ No

If yes, answer the following:

Does your pool have a cover that is used? ☐ Yes ☐ No

How does pool staff clean the pool's filters? ☐ Back wash ☐ Manually

How often are pool chemical levels checked to insure proper balance?

☐ Daily ☐ Bi-weekly ☐ Weekly ☐ Monthly

15. What types of plantings are on your school grounds? (Answer as best you can; check all that apply.)

☐ grass
☐ sports/play field
☐ shrubs
☐ raised beds or containers
☐ native plant garden
☐ non-native plant garden
☐ vegetable garden
☐ other: _____

16. Are native and/or drought-tolerant plants used for landscaping?

☐ Yes ☐ No

17. Is compost or mulch (shredded bark, wood chips) used on the landscaped areas in order to retain moisture? ☐ Yes ☐ No

18. Are your school grounds irrigated? ☐ Yes ☐ No

If so, are there systems for using drip irrigation, timed watering, or captured rainwater?

☐ Yes ☐ No

19. If your school has athletic fields, how often are they watered?

☐ Daily ☐ Weekly ☐ As needed ☐ Not watered ☐ Seasonally

What time of day are they watered?

☐ Morning (6:00 am – 10:00 am)
☐ Late Afternoon (2:00 pm – 5:00 pm)
☐ Early to Mid Afternoon (10:00 am – 2:00 pm)
☐ Evening (5:00 pm – 9:00 pm)

20. How often are lawns (non-athletic) watered?

☐ Daily ☐ Weekly ☐ Twice a week ☐ As needed ☐ Not watered

What time of day are they watered?

☐ Morning (6:00 am – 10:00 am)
☐ Late Afternoon (2:00 pm – 5:00 pm)
☐ Early to Mid Afternoon (10:00 am – 2:00 pm)
☐ Evening (5:00 pm – 9:00 pm)

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Water Quality Issues

21. Is your drinking water tested for chemical contaminants and bacteria?
    If so, please provide date of most recent testing.

    ☑ Yes ☐ No Testing Date _____

    Seattle Public Utilities Water Quality Testing:
    http://www.seattle.gov/util/myservices/water/water_quality/waterqualityannualreport/waterqualityresults/
    Seattle Public Schools Drinking Water Testing:
    http://www.seattleschools.org/modules/cms/pages.phtml?sessionid=&pageid=225566

22. Are there storm drains on or near your school campus? ☐ Yes ☐ No
    If so, do they have signage and/or filters to reduce pollution entering them?

    ☐ Yes ☐ No

23. Are chemical pesticides, herbicides and/or fertilizers used on your school grounds? See Seattle Public Schools Policy H12.00 and Procedure H12.01: Integrated Pest Management

    ☐ Yes ☐ No

24. Do any clubs or organizations within your school organize car washes? ☐ Yes ☐ No
    If so, are they ensuring best practices to manage runoff?

    ☐ Yes ☐ No

25. Are there any other distributed (or non-point) sources of water pollution coming from your school?
    (Consider non-point sources such as oil, pet waste, chemicals, or nutrients such as fertilizer).

    If yes, please describe_____
    _____
    _____
    _____

Indoor Water Audit Worksheet

Your Green Team can decide to use this worksheet and complete calculations by hand, or use the downloadable worksheet, where programmed formulas will complete calculations (You can find this worksheet on our website at: http://wagreenschools.org/36/Water+Quality+&+Conservation.html). Or choose to use both.

This audit is designed to calculate how water is used in restrooms at your school. In order to complete the audit, your Green Team will need to obtain the following information:

- How many gallons of water do the school's toilets use per flush? *(Written on the toilet, or you can estimate.)*
- How many gallons of water do the school's urinals use per flush? *(Written on the urinal, or you can estimate.)*
- What is the flow rate of the faucets in the restrooms? *(Please report in gallons per minute. There are directions below on how to measure the flow rate.)*
- How many students and staff are there at your school? How many males and females in each group?

Total Students	_____	Total Teachers/Staff	_____
Females	_____	Females	_____
Males	_____	Males	_____

Toilet Use

Research on water use in buildings indicates the following average use patterns: Females use the toilet 3 times per day, and males use urinals 2 times per day and the toilet 1 time. You may use these averages to calculate water use patterns for your school.

	Example	Our School
# of females in school	250 females	
# of males in school	200 males	
# of flushes per day (females) *use assumptions from above*	3 flushes/day	
# of flushes per day (males) *use assumptions from above*	1 flush/day	
# of gallons per flush *collect this info at your school*	3 gallons/flush	
# of days in school per year *average is 180 days*	180 days/year	
Total number of gallons flushed per year *calculate this (# of male flushes + # of female flushes)(gallons per flush) (days of school)*	513,000 gallons/year	

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Urinal Use

	Example	Our School
# of males in school	200 males	
# of urinal flushes per day *use assumptions from above*	2 flushes	
# of gallons per flush *collect this info (urinals use 0, 0.5, 1 or 2 gallons per flush)*	1 gallon/flush	
# of days per school year	180 days/year	
# of gallons flushed per year *calculate this (# male flushes)(gallons per flush)(days of school)*	72,000 gallons/year	

Faucet Use

Research indicates that people wash their hands an average of 3 times per day. Typical time running the faucet is approximately 6 seconds, or 0.1 minutes.

	Example	Our School
# of people in school	450 people	
faucet flow rate (gallons/minute) *measure this, see instructions below*	2 gallons/minute	
# of gallons per use *measure to obtain an average or use assumptions from above*	0.2 gallons/use	
# of uses per year *calculate this (# of people in school)(3 uses per day)(180 days)*	243,000 uses/year	
total gallons used in hand washing per year *calculate this (# of uses per year)(gallons per use)*	48,600 gallons/year	

Instructions to measure faucet flow rate

There are two options for measuring the flow rate of your school faucets: 1. Use a flow rate bag (which you can get from WA Green Schools (link)) or 2. Use a large container (pitcher or bucket), measuring cup, and stopwatch. For either option, go to a bathroom to estimate the gallons per minute (GPM) of water that flows from a faucet when it is used. You will need at least three people to make this measurement.

1. Using flow rate bag
   - One person places the plastic bag under the faucet and holds it tightly.
   - A second person turns on the faucet while a third person times the water running for 5 seconds, and says “STOP” at the end of 5 seconds.
   - The person holding the bag pulls it out from under the faucet.
   - Read the gallons per minute (GPM) number on the bag. Record this number for Trial 1.
   - Repeat the above steps for Trials 2 and 3.
   - Calculate the average faucet flow rate from your data.
2. Large container, measuring cup, and stopwatch
   - Let the water flow into the container and keep time as above.
   - Measure the water in the container with the measuring cup.
   - Convert your units to gallons per minute. (1 cup = 0.0625 gallons; 1min = 60 sec)
   - Example Calculation: Your team measured 4 cups in 5 seconds (4 cups = 0.25 gal; 15 sec = 0.083 min).
     - 0.25 gal / 0.083 min = ~ **3gal/min**

Water Audit Questions

Water Assessment and Audit

1. What percentage of total restroom water use does each type make up?
   Toilet _____
   Urinal _____
   Faucet _____

2. Compare the amount of water your school used in the month you completed your assessment and audit (see question #12) and the total amount used in restrooms in one month. What percentage of your school's water use is accounted for in this audit? (*Remember that a school year is only 9 months).*

3. Where else is water being used on campus that could contribute to your total water bill?

4. ★ What do your assessment and audit findings suggest about what would be an effective Lasting Change?

Washington Green Schools would like to thank the following sources for their inspiration and ideas for this Water Assessment and Audit:

Homewaters Project/ Islandwood www.islandwood.org
http://www.eeweek.org/water_wise/water_audit

Congratulations—Your Team has completed Step 2: Assess!

Step 3: Address: Make a Lasting Change

Based on your findings in the assessment and audit, choose a Water Lasting Change(s) that will address an area your school could improve upon, and that results in a long lasting environmental change. *Note: This must be a new action, not something you are already doing.*

Water Lasting Change Examples

- ☐ Start an education program to encourage students and staff to conserve water. Have students and staff members write down personal water saving goals and share them with the large community. Implement your program and measure results.
- ☐ Complete a storm drain stenciling/marking project at your school and neighboring storm drains and implement a campaign to educate the school community about how to protect stormwater.
- ☐ Post permanent notices in all bathrooms about bathroom water conservation practices. Have a monthly "Leak Patrol" check for water leaks and report them to maintenance staff for repair.
- ☐ Implement (design, build, and maintain) a rain garden to reduce runoff from your campus.
- ☐ Introduce native plant landscaping, a drought-tolerant garden, or other type of demonstration area, including informational signs on the environmental benefits.
- ☐ Alter the schools irrigation schedule based on rainfall patterns or initiate the use of sensors to manager watering schedules.
- ☐ Convince your school district to install faucet aerators and/or low-flow toilets, faucets, and urinals.
- ☐ Define your own! What area(s) of water use did your Green Team discover that could be improved? What changes will you make to result in a *significant* long lasting environmental change at your school? Please describe the unique Lasting Change you are implementing:

Remember that if you are making any changes to the school facility or grounds you will need to submit a Seattle Public Schools Self Help Application for review and approval BEFORE beginning your project.

Water Assessment and Audit

Attachments can be found on the Seattle Public Schools website at http://bit.ly/sps-conservation. Click on "Green Team".

Additional Information:

Wastewater Education Resources, King County
http://www.kingcounty.gov/environment/wtd/Education/Resources.aspx

Water Conservation Education, Saving Water Partnership
http://www.savingwater.org/StudentsTeachers/index.htm

Water System Overview, Seattle Public Utilities
http://www.seattle.gov/util/MyServices/Water/AbouttheWaterSystem/WaterSystemOverview/index.htm

Seattle Parks Environmental Learning Centers
Dynamic Education Programs for K-12 Classes and Groups (including Watershed Education)
http://www.seattle.gov/parks/environment/learning.htm

Tours:
http://www.kingcounty.gov/environment/wtd/Education.aspx

- Cedar River Watershed Education Center
  - Near Rattlesnake Lake in the Cascade foothills about 35 miles southeast of downtown Seattle, adjacent to the lake and hiking trails.
    http://www.seattle.gov/util/EnvironmentConservation/OurWatersheds/CedarRiverWatershed/CedarRiverEducationCenter/index.htm

- Brightwater Education & Community Center
  - In Woodinville about 22 miles north of downtown Seattle, with 70 acres of landscaped space and 43 acres of restored salmon habitat and wetlands.
    http://www.kingcounty.gov/environment/brightwater-center.aspx

- West Point Wastewater Treatment Plant
  - In Seattle's Discovery Park. Tours will not be available until after construction is completed in 2016.
    http://www.kingcounty.gov/environment/wtd/Education/WestPoint.aspx

- South Plant Wastewater Treatment
  - In Renton about 12 miles south of downtown Seattle. It is near the CitySoil Farm, Stewardship Partners and Rain Garden Demonstration Project, Waterworks Gardens (where ponds and marshes filter stormwater), Black River Riparian Forest & Wetland, and King Conservation District wetland nursery.
    http://www.kingcounty.gov/environment/wtd/Education/SouthPlant.aspx

This document is available on the Seattle Public Schools website at http://bit.ly/sps-conservation