APPENDIX C

Storm Water BMPs

Table of Contents

BMP: Animal Carcass Removal

Applications

- ☐ Manufacturing
- ■ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ■ Roadways
- ■ Waste Containment

Description:

Removal and proper disposal of animal carcasses can improve storm water quality by reducing pollution or contamination.

Approach:

Animal carcass disposal can have a negative impact upon water quality. If not done properly, carcass disposal can lead to pollution or contamination of storm water. Carcasses should be disposed of within 24 hours. Options for disposal:

- Rendering: This is done by contracting with private rendering companies. Animals that cannot be rendered include sheep, chickens (feathers), and fish (scales). Sheep and chickens can be buried or cremated. Fish can be used as food for dogs, coyotes, or alligators.
- Burial: Contact district health if you intend to bury animal carcasses, but keep in mind that carcasses should be buried at least 6 feet deep and treated with lime and pesticides.
- Cremation. Cremation of any animal carcass within ¼ mile of a municipality could be in violation of the law.

It is not recommended to leave the carcass of any animal within ¼ mile of any inhabited dwellings, public highways, or streams of water for more than 24 hours. Disposal of a carcass shall not be in water or on a publicly used road.

Limitations:

- Location awareness.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☐ Sediment
- ■ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ■ Bacteria & Viruses

Implementation Requirements

BMP: Alternative Discharge of Chlorinated Water

ADCW

Description:

Chlorinated water discharged to surface waters has an adverse impact on local water quality. Swimming pools are a major source of chlorinated water discharged into sanitary and storm sewer systems. An average swimming pool holds 19,000 gallons of chlorinated water. Pools have high concentrations of chlorine, which is toxic to wildlife and fish.

Approach:

- Many pool owners who live in cooler climates drain their swimming pools to reduce maintenance and potential damage from freezing during harsh winters. These individuals should not discharge pool water to the storm sewer system or directly into a water body and should investigate alternative discharge options.
- Pool owners obtain permission from local sanitary sewer operators or municipal treatment plant operators and discharge to the sanitary sewer system.
- Discharge the chlorinated water to land, where it will not drain to local surface waters.
- De-chlorinate the water before draining the pool.

Limitations:

- Enforcement of safe discharge of chlorinated water may be difficult to achieve.

Applications

- ☐ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment
- ☒ Housekeeping Practices

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☐ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☐ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Alternative Products

AP

Examples of alternative products include rechargeable batteries, baking soda, olive oil, vegetable oil, a lemon, a toothbrush, and a rag

Applications

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☐ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment

Description:

Using alternatives to toxic substances drastically reduces their presence in storm water and receiving waters. The most common toxic substances found in the home are cleaners, automotive products, and pesticides. Fertilizers, paints, and fuels are among other common hazardous substances frequently found in ground water because of improper disposal (WEF and ASCE, 1998).

Approach:

- The promotion of safer alternative products should be coupled with other programs designed to reduce the presence of hazardous or toxic materials in homes and storm water runoff such as hazardous materials collection, good housekeeping or material management practices, oil and automotive waste.

- One of the best ways to encourage homeowners to switch to alternatives to potentially harmful products is to educate them.
- *Aerosols*. Pump-type or non-aerosol products should be used.
- *Chemical fertilizers*. Composting yard clippings and food scraps is an option. Manure (in measured amounts) is another alternative to chemical fertilizers.
- *Household cleaners and detergents*. Baking soda is an excellent cleanser with mild abrasive power that can be used in lieu of heavy-duty cleansers. A mixture of 1 quart water and 2 tablespoons of vinegar can be used as a window cleaner. Three parts olive oil mixed with one part white vinegar can be used for a wood cleanser. Borax and lemon juice make an excellent toilet cleaner. Many other non- or less-toxic alternatives to harsh cleansers exist.

Limitations:

- In some cases, alternative products may not be readily available.
- The biggest impediment to instituting widespread use of alternative products is public awareness. Municipal staff must convince people to change old habits or to try new products.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

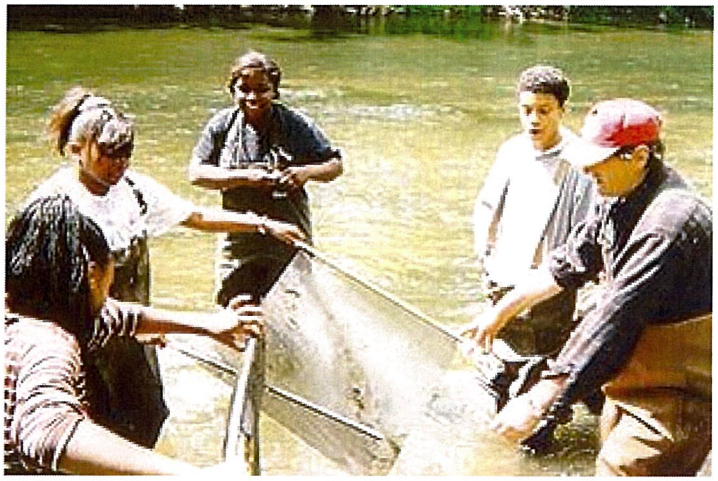
- ☐ Sediment
- ■ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ■ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

Implementation Requirements

- ☒ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☒ Training

BMP: Adopt-A-Stream

AS



Applications

- ☐ Manufacturing
- ■ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ■ Waste Containment
- ■ Housekeeping Practices

Description:

Adopt-A-Stream programs are an excellent public outreach tool for municipalities to involve citizens of all ages and abilities. These programs are volunteer programs in which participants "adopt" a stream, creek, or river to study, clean up, monitor, protect, and restore. Through these activities, the adopting group or organization becomes the primary caretaker of that stretch of stream in the watershed.

Approach:

- Municipalities can begin an Adopt-A-Stream program by obtaining a watershed map and marking potential stream sites on it. The map can then be used to keep track of which stretches are adopted and by whom.
- Identify different types of activities that can be done to improve streams within the city.
- Prepare "how to" packets for each stream improvement activity that can be distributed to interested organizations. For example, a packet for conducting a stream cleanup might include trash bags and gloves, a map designating appropriate trash pickup sites along the stream and private land areas for which special permission might be required, and a list of contact information for trash collectors and recyclers.
- Require documentation to be completed by the participants, such as a registration forms, and cleanup reports.
- The media should be used whenever possible to spread the word about the Adopt-A-Stream program and the activities it sponsors. Advertisements can be placed in newspapers, public service announcements (PSAs) can be broadcast on TV and radio, and an Internet site can be developed with program information.
- Many Adopt-A-Stream programs partner with schools to develop interdisciplinary classroom curricula and activities. Through the program, teachers and students adopt a waterway and perform chemical, physical, and biological testing to determine water quality and perform habitat restoration.

Limitations:

- Commitment. Many people sign up for activities but quickly find they do not have time for follow-up activities. This is one reason youth groups are so well suited for these projects. By integrating a stream program into a curriculum or into a yearly scout project, the group's commitment is ensured.
- Other limitations may include funding availability, weather, equipment maintenance, and liability associated with the dangers of slippery rocks or steep slopes.

Maintenance:

- To maintain water quality, cleanup efforts must be recurring.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ☒ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☒ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ■ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Alternative Turnarounds

AT

Rather than having a fully paved cul-de-sac bulb, site designers can incorporate pervious circles with vegetation that reduce the site's

Description:

Alternative turnarounds are designs for end-of-street vehicle turnaround that replace cul-de-sacs and reduce the amount of impervious cover created in residential neighborhoods. Cul-de-sacs are local access streets with a closed circular end that allows for vehicle turnarounds. Many of these cul-de-sacs can have a radius of more than 40 feet. From a storm water perspective, cul-de-sacs create a huge bulb of impervious cover, increasing the amount of storm water runoff. For this reason, reducing the size of cul-de-sacs through the use of alternative turnarounds or eliminating them altogether can reduce the amount of impervious cover created at a site.

Successful urban forestry requires a conservation plan for individual trees as well as forest areas larger than 10,000 feet². A local forest or tree ordinance is one technique for achieving conservation, and when specific measures to protect and manage these areas are included, urban forests and trees can also help reduce storm water management needs in urban areas.

Approach:

- Numerous alternatives create less impervious cover than the traditional 40-foot cul-de-sac. These alternatives include reducing cul-de-sacs to a 30-foot radius and creating hammerheads, loop roads, and pervious islands in the cul-de-sac center.
- Alternative turnarounds can be applied in the design of residential, commercial, and mixed-use developments.
- Sufficient turnaround area is a significant factor to consider in the design of cul-de-sacs. In particular, the types of vehicles entering into the cul-de-sac should be considered.
- Research shows that some fire trucks are designed for smaller turning radii. In addition, many new larger service vehicles are designed using a tri-axle, and school buses usually do not enter individual cul-de-sacs.

Limitations:

- Local regulations often dictate requirements for turnaround radii, and some of the alternatives may not be allowed by local codes.
- Marketing perceptions may also dictate designs, particularly in residential areas.

Maintenance:

- If islands are constructed as part of a turnaround, these areas will need to be maintained.

Applications

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☐ Commercial Activities
- ☒ Roadways
- ☐ Waste Containment

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☒ Sediment
- ☒ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☒ Floatable Materials
- ☐ Bacteria & Viruses

Implementation Requirements

- ☒ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☐ Training

BMP: Biofilters

BF

Considerations

- ☒ Soils
- ☒ Area Required
- ☒ Slope
- ☒ Water Availability
- ☒ Aesthetics
- ☐ Hydraulic Head
- ☐ Environmental Side Effects

Description:

Biofilters are of two general types: vegetated channel and vegetated filter strip. The vegetated channel is sloped like a standard storm drain channel; the stormwater is treated as it passes through the channel. With filter strips the flow is distributed broadly along the width of the vegetated area.

Application:

- Comparable performance to wet ponds and constructed wetlands.
- Limited to treating a few acres.

Installation/Application Criteria:

- Limited to treating a few acres and availability of water during dry season.
- The surface area must be defined.
- The minimum width for a swale is determined by Mannings Equation.
- Minimum length of a strip is 10 feet.
- The longitudinal slope must not exceed 5%.
- Use a flow spreader and energy dissipator at the entrance of a swale.
- Good soils are important to achieve good vegetation cover.

Limitations:

- Poor performance has occurred but this appears to be due to poor design.
- May be limited to areas where summer irrigation is feasible.
- Can be difficult to maintain sheet flow in strips.
- Can be difficult to avoid channelization in swales.
- Cannot be placed on steep slope.
- Area required may make infeasible on industrial sites.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ☒ Nutrients
- ☒ Heavy Metals
- ☒ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☒ Floatable Materials
- ☐ Bacteria & Viruses

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

BMP: BMP Inspection and Maintenance

BMPIM

Applications

- ☐ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment

Description:

Inspect and maintain all structural BMP's (both existing and new) on a routine basis to remove pollutants from entering storm drain inlets. This includes the establishment of a schedule for inspections and maintenance.

Approach:

Regular maintenance of all structural BMP's is necessary to ensure their proper functionality.

- Annual inspections.
- Prioritize maintenance to clean, maintain, and repair or replace structures in areas beginning with the highest pollutant loading.
- Clean structural BMP's in high pollutant areas just before the wet season to remove sediments and debris accumulated during the summer and fall.
- Keep accurate logs of what structures were maintained and when they were maintained.
- Record the amount of waste collected.

Limitations:

- Cost
- Availability of trained staff

Targeted Pollutants

- ■ Sediment
- ■ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact

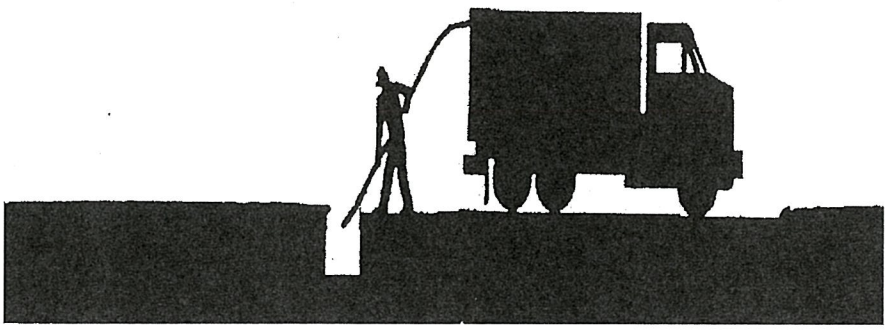
Implementation Requirements

- ■ Capital Costs
- ■ O&M Costs
- ☒ Maintenance
- ☒ Staffing
- ☐ Training
- ☐ Administrative

■ High ☒ Medium ☐ Low

BMP: Catch Basin Cleaning

CBC



PROGRAM ELEMENTS

9 New Development

9 Residential

9 Commercial Activities

9 Industrial Activities

: Municipal Facilities

: Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

DESCRIPTION:

Maintain catch basin and storm water inlets on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, and restore the catch basins= sediment trapping capacity. A catch basin is distinguished from a storm water inlet by having at its base a sediment sump designed to catch and retain sediments below the overflow point. This information sheet focuses on the cleaning of accumulated sediments from catch basins.

APPROACH:

Regular maintenance of catch basins and inlets is necessary to ensure their proper functioning. Clogged catch basins are not only useless but may act as a source of sediments and pollutants. In general, the key to effective catch basins are:

< At least annual inspections.
< Prioritize maintenance to clean catch basins and inlets in areas with the highest pollutant loading.
< Clean catch basins in high pollutant load areas just before the wet season to remove sediments and debris accumulated during the summer.
< Keep accurate logs of the number of catch basins cleaned.
< Record the amount of waste collected.

LIMITATIONS:

There are no major limitations to this best management practice.

MAINTENANCE:

Regular maintenance of public and private catch basins and inlets is necessary to ensure their proper functioning. Clogged catch basins are not only useless but may act as a source of sediments and pollutants. In general, the keys to effective catch basins are:

< Annual/monthly inspection of public and private facilities to ensure structural integrity, a clean sump, and a stenciling of catch basins and inlets.
< Keep logs of the number of catch basins cleaned.
< Record the amount of waste collected.

TARGETED POLLUTANTS

Sediment
: Nutrients
Heavy Metals
9 Toxic Materials
: Oxygen Demanding Substances
: Oil & Grease
Floatable Materials
9 Bacteria & Viruses

■ High Impact

☒ Medium Impact

☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

: Capital Costs
O&M Costs
9 Regulatory
: Training
Staffing
: Administrative

■ High ☒ Medium ☐ Low

BMP: Community Cleanup

CC

Applications

- ☐ Manufacturing
- ■ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ■ Roadways
- ■ Waste Containment
- ■ Housekeeping Practices

Description:

An event in which the community will promote and encourage community members to clean up neighborhoods, city parks, streets, streams, or other properties. This effort involves the removal of litter and bulky waste as well as the removal of green waste, such as yard clippings, trees, branches, leaves, or other types of undesirable vegetation.

Approach:

- Designate an individual or groups of individuals to schedule and organize the cleanup projects, coordinate waste collection and disposal, and assign leaders for supervision of the projects.
- Identify sites that need to be cleaned up in the community, and plan when to have the cleanups.
- Advertise the program and let residents know about cleanup project dates, locations, and what items will be helpful for them to bring to assist in the projects.
- When volunteers are being used for cleanup efforts, municipalities must address the issue of liability. An attorney should be consulted to determine how liability should be handled and draft a waiver for volunteers to sign before participating.

Limitations:

- Organization at the municipal level is a limitation to cleanup efforts. Some municipalities do not have the resources to designate staff to oversee a cleanup program and to supervise cleanup activities.
- Limitations to an effective cleanup program are volunteer interest and commitment.

Maintenance:

- To maintain water quality, cleanup efforts must be recurring; a one-time-only cleanup event might raise awareness in the community, but it will not keep trash out of the river.
- Seasonal or annual cleanup events will help make sure that trash and debris are kept out of public areas as much as possible.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☒ Sediment
- ☐ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☐ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

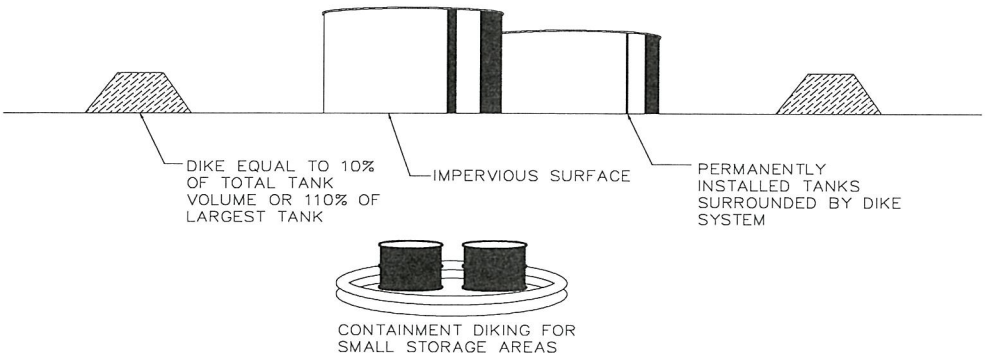
Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Containment Dikes

CD



APPLICATIONS

- ☒ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☐ Housekeeping Practices

DESCRIPTION:

Containment dikes are temporary or permanent earth or concrete berms or retaining walls that are designed to hold spills. Diking, one of the most common types of containment, is an effective method of pollution prevention for above-ground liquid storage tanks and rail car or tank truck loading and unloading areas. Diking can provide one of the best protective measures against the contamination of stormwater because it surrounds the area of concern and holds the spill, keeping spill materials separated from the stormwater outside of the diked area.

APPROACH:

- Containment dikes should be large enough to hold an amount equal to the largest single storage tank at the particular facility plus the volume of rainfall or 10% of total tank volume.
- Materials used to construct the dike should be strong enough to safely hold spilled materials. Materials used usually depend on what is available onsite and the substance to be contained. The material may consist of earth (i.e., soil or clay), concrete, synthetic materials (liners), metal, or other impervious materials.
- Containment dikes may need to be designed with impervious materials to prevent leaking or contamination of stormwater, surface, and ground water supplies.
- Uncontrolled overflows from diked areas containing spilled materials or contaminated stormwater should be prevented to protect nearby surface and ground waters. Therefore, dikes should have either pumping systems or vacuum trucks available to remove the spilled materials.

LIMITATIONS:

- May be too expensive for small facilities.
- Could collect contaminated stormwater, possibly resulting in infiltration of stormwater to ground water.

MAINTENANCE:

Inspections should be conducted during or after significant storms or spills to check for washouts or overflows. In addition, regular checks of containment dikes (i.e., testing to ensure that dikes are capable of holding spills) is recommended.

SOUTH SALT LAKE PUBLIC WORKS

IMPLEMENTATION REQUIREMENTS

- ■ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☒ Training

BMP: Conservation Easement

CE

Applications

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment
- ☐ Housekeeping Practices

Description:

Conservation easements are voluntary agreements that allow an individual or group to set aside private property to limit the type or amount of development on their property. The conservation easement can cover all or a portion of a property and can either be permanent or last for a specified time. The easement is typically described in terms of the resource it is designed to protect (e.g., agricultural, forest, historic, or open space easements) and explains and mandates the restrictions on the uses of the particular property. Easements relieve property owners of the burden of managing these areas by shifting responsibility to a private organization (land trust) or government agency better equipped to handle maintenance and monitoring issues.

Conservation easements are thought to make a contribution to protecting water quality, mostly in an indirect way. Land set aside in a permanent conservation easement is land that will have a prescribed set of uses or activities, generally restricting future development.

The location of the land held in a conservation easement may also determine if it will provide water quality benefits. Property along stream corridors and shorelines can act as a vegetated buffer that may filter out pollutants from storm water runoff.

Approach:

- Conservation easements are typically done to preserve agricultural lands and natural areas that are facing development pressure on the suburban-rural fringe.
- By agreeing to give up or restrict the development rights for a parcel of land, a landowner can guarantee that their property will remain in a prescribed state for perpetuity while receiving tax benefits.
- For maximum efficiency, spilled materials should be removed immediately, to allow space for future spills.
- States also use conservation easements and land purchase programs to protect significant environmental features and tracts of open space.

Limitations:

- No hard evidence that conservation easements actually do protect water quality.
- Another is that conservation easements are often not an option in more urbanized areas, where the size, quality, and cost of land can restrict the use of easements.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☐ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

BMP: Contractor Education

CED

DESCRIPTION:

One of the most important factors determining whether or not erosion and sediment controls will be properly installed and maintained on a construction site is the knowledge and experience of the contractor. Many communities require certification for key on-site employees who are responsible for implementing the ESC plan. Several states have contractor certification programs. Where certification programs are not being offered it is important to at least have some informal training. Making contractors aware of potential problems will go a long way toward reducing construction site pollution.

APPROACH:

- Contractor education will help to ensure that the plans are properly implemented and that best management practices are properly installed and maintained.
- Contractor education can be accomplished through municipally sponsored training courses, or more informally, municipalities can hold mandatory pre-construction or pre-wintering meetings and conduct regular and final inspection visits to transfer information to contractors .

LIMITATIONS:

- Contractor education programs require a substantial amount of effort on the part of the municipality or regulatory agency.
- They need to develop curricula for training courses, dedicate staff to teach courses, and maintain a report review and site inspection staff to ensure that both contractors and inspectors are fulfilling their obligations and complying with the ESC program.

PROGRAM ELEMENTS

: New Development
: Residential
: Commercial Activities
: Industrial Activities
: Municipal Facilities
: Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
Nutrients
9 Heavy Metals
Toxic Materials
Oxygen Demanding Substances
Oil & Grease
Floatable Materials
9 Bacteria & Viruses

■ High Impact

☒ Medium Impact

☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

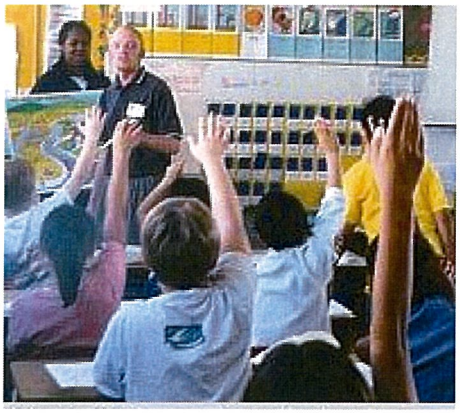
: Capital Costs
: O&M Costs
9 Regulatory
: Training
: Staffing

9 Administrative

■ High ☒ Medium ☐ Low

BMP: Classroom Education On Storm Water

CESW



APPLICATIONS

- ☐ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

DESCRIPTION:

Classroom education is an integral part of any storm water pollution outreach program. Providing storm water education through schools exposes the message not only to students but to their parents as well. Topics can include Water conservation, proper lawn and garden care, and proper disposal of hazardous household wastes.

APPROACH:

- Building a strong relationship with the school district is the most important step in getting storm water education into the schools.
- When developing an outreach message for children, choose the age ranges to target.
- Many additional classroom materials are available for use free of cost. Educational materials available for downloading from the Internet at www.csu.org/water/watereducation/watereducation.html.
- Should make students aware of the potential impacts of hazardous household materials on water quality and inform residents of ways to properly store, handle, and dispose of the chemicals
- Water usage in the home can easily be reduced by 15 to 20 percent—without major discomfort—by implementing a program to conserve water in the home.
- Lawn and garden activities can result in contamination of storm water through pesticide, soil, and fertilizer runoff. Proper landscape management, however, can effectively reduce water use and contaminant runoff and enhance the aesthetics of a property.

LIMITATIONS:

- One of the limitations of classroom education is being able to incorporate storm water issues into the school curricula. With so many subjects to teach, environmental issues might be viewed as less important.

MAINTENANCE:

- Programs and educational materials can be re-used, but they must be presented on a continual basis.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ■ Sediment
- ■ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ■ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Community Hotlines

CH

Applications

- ■ Manufacturing
- ■ Material Handling
- ■ Vehicle Maintenance
- ■ Construction
- ■ Commercial Activities
- ☒ Roadways
- ☒ Waste Containment
- ■ Housekeeping Practices

Description:

Because regulators and authorities cannot monitor all water bodies at once, they sometimes rely on the public to keep them informed of water polluters. Community hotlines provide a means for concerned citizens and agencies to contact the appropriate authority when they see water quality problems.

Approach:

- Once a city has determined that they need a hotline, they should choose between a telephone or an e-mail hotline.
- A party or agency responsible for maintaining the hotline and responding to incoming complaints must first be identified. The responsible party could be a division of local government, a water quality board, a public utility, or an environmental agency.
- All distributed materials should include pollution hotline numbers and information.
- Curbs should have pumping systems, instead of drainage systems, for collecting spilled materials.
- Generally, an investigation team promptly responds to a hotline call and, in most cases, visits the problem site.
- If a responsible party can be identified, the team informs the party of the problem, offers alternatives for future disposal, and instructs the party to resolve the problem.

Limitations:

- The community's ability to pay for it.
- The ability of the community to keep the hotline staffed.

Maintenance:

- The most important part is the responsiveness of the hotline. If a citizen reports an illegal dumping but no action is taken by the appropriate authority, that citizen could lose faith in the hotline and might not call back with future information.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☒ Sediment
- ☒ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☒ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ☒ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Covering

CO

APPLICATIONS

- ☒ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment

DESCRIPTION:

Covering is the partial or total physical enclosure of materials, equipment, process operations, or activities. Covering certain areas or activities prevents stormwater from coming into contact with potential pollutants and reduces material loss from wind blowing. Tarpaulins, plastic sheeting, roofs, buildings, and other enclosures are examples of covering that are effective in preventing stormwater contamination. Covering can be temporary or permanent.

APPROACH:

- Covering is appropriate for outdoor material storage piles (e.g., stockpiles of dry materials, gravel, sand, compost, sawdust, wood chips, and de-icing salt) as well as areas where liquids and solids in containers are stored or transferred.
- While it may be too expensive to cover all industrial activities, cover all high-risk areas first (e.g., chemical preparation areas, vehicle maintenance areas, and areas where salts are stored), then according to budget cover the rest of the materials.
- Evaluate the strength and longevity of the covering, as well as its compatibility with the material or activity being enclosed.
- When designing an enclosure, consider access to materials, their handling, and transfer.
- Materials that pose environmental and safety dangers require special ventilation and temperature considerations.
- Covering alone may not protect the materials. When designing, consider placing materials on an elevated, impermeable surface or build curbing around the outside of the materials to prevent problems from runon of uncontaminated stormwater from adjacent areas.
- Anchor all coverings with stakes, tie-down ropes, large rocks, tires or other easily available heavy objects.

LIMITATIONS:

- Requires frequent inspection.
- May pose health or safety problems if enclosure is built over certain activities.

MAINTENANCE:

- Frequently inspect coverings for rips, holes and general wear.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

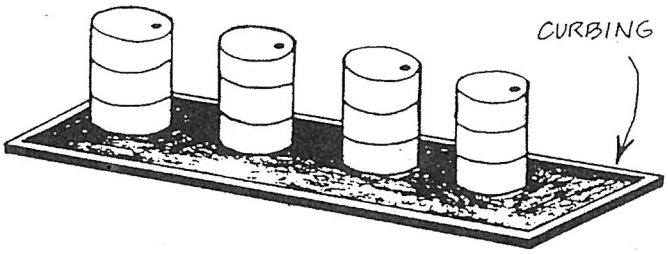
- ■ Sediment
- ☒ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☒ Floatable Materials
- ☒ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ■ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☐ Training

BMP: Curbing

CU



APPLICATIONS

- ☒ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment

DESCRIPTION:

Curbing is a barrier that surrounds an area of concern, much like containment diking (See Containment Diking BMP). Curbing prevents spills, leaks, etc. from being released to the environment by routing runoff to treatment or control areas. The terms curbing and diking are sometimes used interchangeably.

APPROACH:

- Curbing can be used at all industrial facilities. It is particularly useful in areas where liquid materials are transferred and as a stormwater runoff control.
- As with diking, common materials for curbing include earth, concrete, synthetic materials, metal, or other impenetrable materials. Asphalt is also a common material used in curbing.
- For maximum efficiency, spilled materials should be removed immediately, to allow space for future spills.
- Curbs should have pumping systems, instead of drainage systems, for collecting spilled materials.
- Curb systems should be maintained through curb repair (patching and replacement).
- To minimize the amount of spilled material tracked outside of the area by personnel, grade within the curbing to direct the spilled materials to a down-slope side of the curbing, thus keeping the spilled materials away from personnel and equipment. Grading will also facilitate clean-up.

LIMITATIONS:

- Curbing is not effective for holding large spills.
- May require more maintenance than diking.

MAINTENANCE:

- Inspection should be conducted before and after storm events.
- When certain spills occur, cleanup should start immediately, thus preventing overflows and contamination of stormwater runoff.
- Inspection should also be made to clear clogging debris, prevent dilution by rainwater, and to again prevent overflow of any materials.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

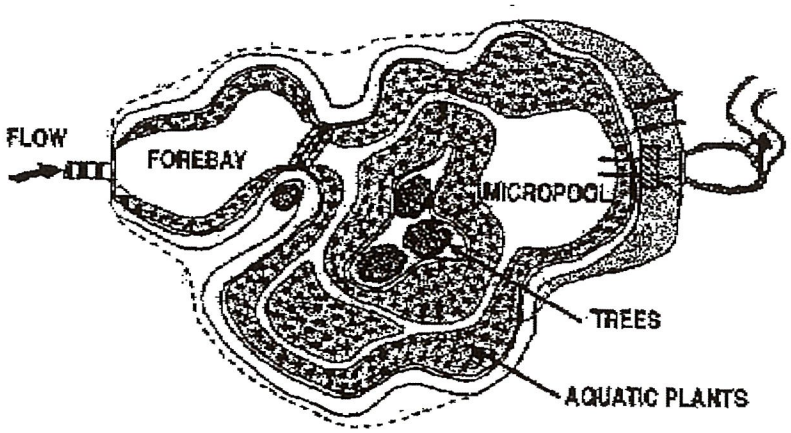
- ☒ Sediment
- ☐ Nutrients
- ☒ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☒ Floatable Materials
- ☐ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

BMP: Constructed Wetlands

CW



DESCRIPTION:

Constructed wetlands have a significant percentage of the facility covered by wetland vegetation.

APPLICATION:

< Need to achieve high level of particulate and some dissolved contaminant removal.
< Ideal for large, regional tributary areas.
< Multiple benefits of passive recreation and wildlife.

INSTALLATION/APPLICATION CRITERIA:

< Suitable soils for wetland vegetation are required.
< Surface area equal to at least 1% and preferably 2% of the tributary watershed.
< Include a forebay for extra storage and to trap incoming sediment.
< Involve qualified wetland ecologist to design and install wetland vegetation.
< Establishing wetland vegetation may be difficult.

LIMITATIONS:

< Concern for mosquitoes.
< Cannot be placed on steep unstable slopes.
< Need base flow to maintain water level.
< Not feasible in densely developed areas.
< Nutrient release may occur during winter.
< Overgrowth can lead to reduced hydraulic capacity.
< Regulatory agencies may limit water quality to constructed wetlands.

MAINTENANCE:

< Remove foreign debris and sediment build-up.
< Areas of bank erosion should be repaired.
< Remove nuisance species.
< Control mosquitoes.

CONSIDERATIONS

: Soils
: Area Required
: Slope
: Water Availability
: Aesthetics
9 Hydraulic Head
: Environmental Side Effects

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
Nutrients
Heavy Metals
Toxic Materials
Oxygen Demanding Substances
Oil & Grease
Floatable Materials
: Bacteria & Viruses

■	High Impact
☒	Medium Impact
☐	Low or Unknown Impact

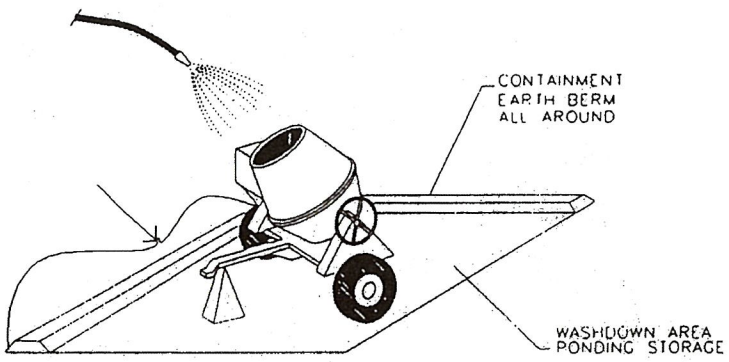
IMPLEMENTATION REQUIREMENTS

Capital Costs
: O&M Costs
: Maintenance
9 Training

■	High	☒	Medium	☐	Low

BMP: Concrete Waste Management

CWM



Locate 50' From Nearest Drainage Area.

Objectives

- ☐ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Description:

Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

Applications:

This technique is applicable to all types of sites.

Installation/Application Criteria:

- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete or cement on-site.
- Perform washout of concrete trucks off-site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water within a bermed or level area. (See Earth Berm Barrier information sheet.)
- Train employees and subcontractors in proper concrete waste management.

Limitations:

- Off-site washout of concrete wastes may not always be possible.

Maintenance:

- Inspect subcontractors to ensure that concrete wastes are being properly managed.
- If using a temporary pit, dispose hardened concrete on a regular basis.

Targeted Pollutants

- ☐ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☒ Other Waste

■ High Impact

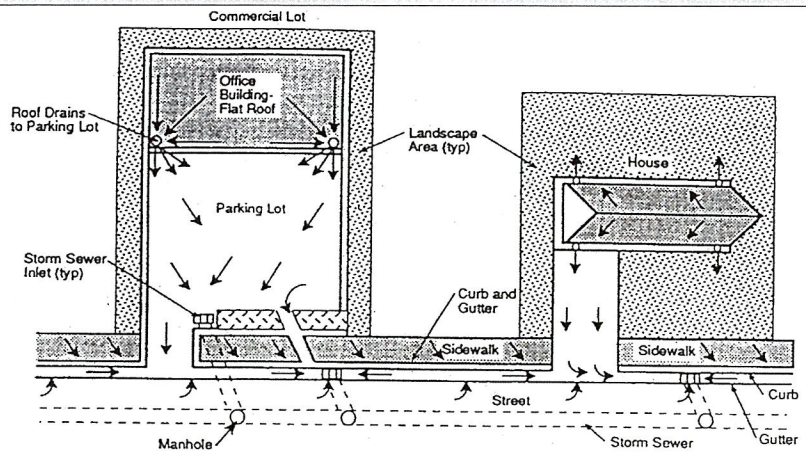
☒ Medium Impact
☐ Low or Unknown Impact

Implementation Requirements

- ☐ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☒ Training

BMP: Minimizing DCIAs

DCIA



DESCRIPTION:

Minimizing directly connected impervious areas (DCIAs) is a structural BMP strategy that requires a basic change in drainage design philosophy. The basic principle is to direct stormwater runoff to landscaped areas, grass buffer strips, and vegetated swales to slow down the rate of runoff, reduce runoff volumes, attenuate peak flows, and encourage filtering and infiltration of stormwater.

APPLICATIONS:

It can be made an integral part of drainage planning for any development.

INSTALLATION/APPLICATION CRITERIA:

< Use on sites with general terrain slopes flatter than 3-4%.
< Design the site drainage flowpath to maximize flow over vegetated areas before leaving a site.
< Minimize ground slopes to limit erosion and slow down water flow.
< Select vegetation that will not only survive, but also enhance water quality.

LIMITATIONS:

< Potential increase in site open space requirements over the traditional development systems.
< Introduction of a nonconventional development design strategy.
< Infiltration of water near building foundations and parking lots is a concern.
< Will likely result in increased maintenance along the swales.

MAINTENANCE:

< Maintain grass and other vegetation.
< Pick up debris.
< Conduct ongoing inspections for potential erosion problems and changes in drainage patterns.
< Remove sediment buildup and replace damaged grass cover.

CONSIDERATIONS

9 Soils
9 Area Required
: Slope
9 Water Availability
: Aesthetics
9 Hydraulic Head
9 Environmental Side Effects

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
9 Nutrients
: Heavy Metals
9 Toxic Materials
9 Oxygen Demanding Substances
: Oil & Grease
: Floatable Materials
9 Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

: Capital Costs
: O&M Costs
: Maintenance
9 Training

■ High ☒ Medium ☐ Low

BMP: De-Icing Chemical Use and Storage

DCUS

Applications

- ☐ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ☒ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

Description:

A sizeable amount of de-icing chemicals are used each winter on roads, parking lots, and sidewalks in Utah. Sodium chloride (salt) is the main chemical used. Proper use and storage of salt will reduce the chance of high chloride concentration in runoff that may damage the environment.

Approach:

- Proper storage practices can control sodium chloride pollution in runoff from stockpiles.
- For de-icing use, preventing over-application of salt will reduce quantities of chloride reaching surface or ground water.
- All salt piles should be covered with polyethylene if not stored in a shed. All sand/salt piles should be moved too empty salt sheds or covered during the spring and summer.
- Any runoff from stockpiles should be contained.
- To prevent over-application of salt one must properly calibrate the equipment and monitor the need for de-icing material.
- Another method to prevent the over-application of salt is to limit salt application on low traffic areas and straight level areas, critical areas will, however, need higher levels of service.

Limitations:

- All deicers hold the potential for damaging grass and plant biota should their concentration within the soil becomes unusually high. In amounts recommended for sidewalk and driveway deicing, there is minimal chance of damage to trees, grass, and shrubs. This is especially true if the chemical is used sparingly -- only to undercut snow and ice -- and the slush is not plowed or shoveled into grassy or planted areas.
- Another concern of many businesses and homeowners is the visible deicer residue that may be tracked into a building. This residue occurs because these deicers are solids in their natural state. However, since the residue is water soluble, it cleans up readily using plain water or ordinary household cleaner.
- Salt should not be used to melt every bit of snow and ice. Use only enough to break the ice/pavement bond, then remove the remaining slush by plowing or shoveling.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

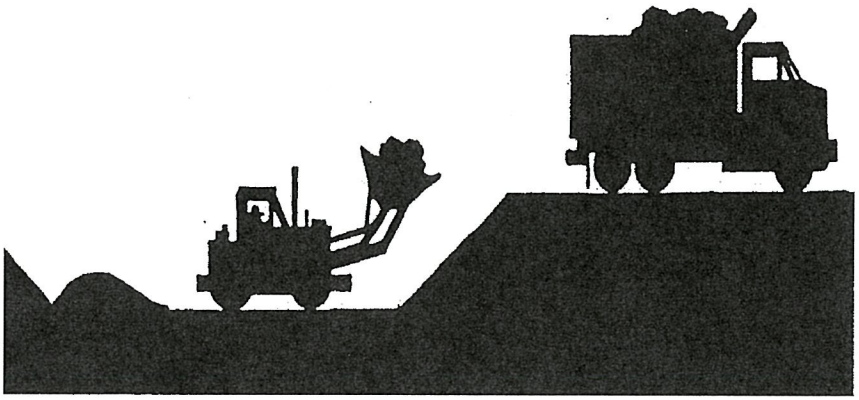
- ☐ Sediment
- ☒ Nutrients
- ☒ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☒ Floatable Materials
- ☐ Bacteria & Viruses

Implementation Requirements

- ☒ Capital Costs
- ■ O&M Costs
- ☒ Maintenance
- ☐ Training

BMP: Detention/Infiltration Device Maintenance

DIDM



Description:

Proper maintenance and siltation removal is required on both a routine and corrective basis to promote effective stormwater pollutant removal efficiencies for wet/dry detention pond and infiltrative devices.

Approach:

< Remove silt after sufficient accumulation.
< Periodically clean accumulated sediment and silt out of pre-treatment inlets.
< Infiltration device silt removal should occur when the infiltration rate drops below 2 inch per hour.
< Removal of accumulated paper, trash, and debris should occur every six months or as needed to prevent clogging of control devices.
< Vegetation growth should not be allowed to exceed 18 inches in height.
< Mow the slopes periodically and check for clogging, erosion and tree growth on the embankment.
< Corrective maintenance may require more frequent attention (as required).
< Create a public education campaign to explain the function of wet/dry detention pond/infiltration devices and their operation requirements for proper effectiveness.
< Encourage the public to report wet/dry detention pond/infilitration devices needing maintenance.

Limitations:

< Wet detention pond dredging can produce slurried waste that often exceeds the requirements of many landfills.
< Frequent sediment removal is labor and cost intensive.

Program Elements

9 New Development
9 Residential
9 Commercial Activities
9 Industrial Activities
: Municipal Facilities
9 Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

Sediment
: Nutrients
Heavy Metals
9 Toxic Materials
: Oxygen Demanding Substances
9 Oil & Grease
9 Floatable Materials
Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

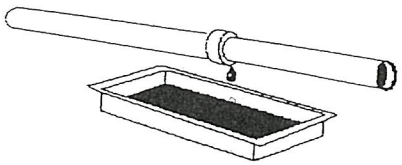
Implementation Requirements

: Capital Costs
O&M Costs
9 Regulatory
9 Training
: Staffing
9 Administrative

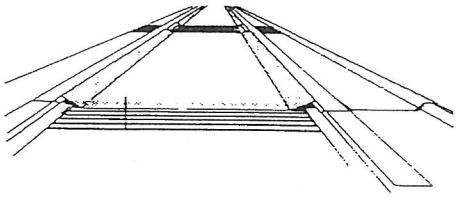
■ High ☒ Medium ☐ Low

BMP: Drip Pans

DP



Use Drip Pans for Leaking Equipment



Use Drip Pans in Loading and Unloading Areas

APPLICATIONS

- ☒ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment

DESCRIPTION:

Drip pans are small depressions or pans used to contain very small volumes of leaks, drips, and spills that occur at a facility. Drip pans can be depressions in concrete, asphalt, or other impenetrable material. They can be made of metal, plastic, or any material that does not react with the dripped chemicals. Drip pans can be temporary or permanent.

Drip pans are used to catch drips from valves, pipes, etc. so that the materials or chemicals can be cleaned up easily or recycled before they contaminate stormwater. Although leaks and drips should be repaired and eliminated as part of a preventative maintenance program, drip pans can provide a temporary solution where repair or replacement must be delayed. In addition, drip pans can be an added safeguard when they are positioned beneath areas where leaks and drips may occur.

APPROACH:

- When using drip pans, consider the location of the drip pan, weather conditions, the type of material used for the drip pan, and how it will be cleaned.
- The location of the drip pan is important. Because drip pans must be inspected and cleaned frequently, they must be easy to reach and remove. However, take special care to avoid placing drip pans where they can be easily overturned or be a safety hazard.
- Secure pans by installing or anchoring them. Drip pans may be placed on platforms, behind wind blocks or tied down.
- Employees must pay attention to the pans and empty them when they are nearly full.
- Frequent inspection of the drip pans is necessary due to the possibility of leaks in the pan itself or in piping or valves that may occur randomly or irregular slow drips that may increase in volume.

LIMITATIONS:

- Contain small volumes only.
- Must be inspected and cleaned frequently.
- Must be secured during poor weather conditions.
- Contents may be disposed of improperly unless facility personnel are trained in proper disposal methods.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ☐ Sediment
- ☐ Nutrients
- ☒ Heavy Metals
- ■ Toxic Materials
- ☒ Oxygen Demanding Substances
- ■ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ☐ Capital Costs
- ☐ O&M Costs
- ■ Maintenance
- ☒ Training

BMP: Dry Weather Screening

DWS

Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☐ Housekeeping Practices

Description:

Inspection of drainage-ways during dry-weather at least ten days after a storm. Report and documentation of active flowing drainage-ways. General assessment of water quality. Actively flowing drainage-ways are then followed upstream to identify the source.

Approach:

- Organize a group of people to inspect drainage-ways during dry-weather at least ten days after a storm.
- Provide a map of the land layout and the storm drainage system in order to efficiently locate checkpoints and mark areas where water is flowing.
- In areas where water is flowing, a general assessment of the water quality can be made with respect to discoloration, pollutants, and odor.
- Document and report the status of all checkpoints to the authorized municipality.
- The municipality then makes efforts to follow up and identify the source of the water. Sources should then be marked on a system map.
- Illicit discharges should be disconnected and removed from the system.

Limitations:

- Permission may be required to access private properties.
- Inaccurate map data may result in confusion.
- Water coming from springs, land drains and surfacing ground water can be difficult to trace.

Maintenance:

- Identified non-storm water sources should be monitored on a regular basis to ensure no contamination enters the storm water system.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☐ Sediment
- ■ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ■ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

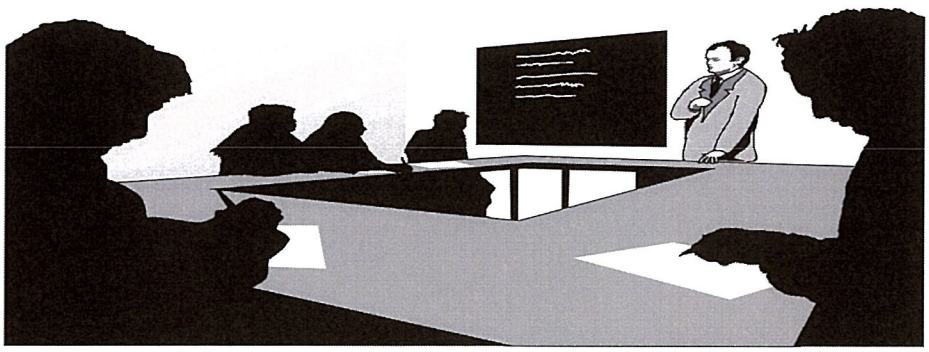
Implementation Requirements

- ■ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Employee Training

ET



DESCRIPTION:

Employee training, like equipment maintenance, is a method by which to implement BMPs. Employee training should be used in conjunction with all other BMPs as part of the facility=s SWPPP.

The specific employee training aspects of each of the source controls are highlighted in the individual information sheets. The focus of this information sheet is more general, and includes the overall objectives and approach for assuring employee training in stormwater pollution prevention. Accordingly, the organization of this information sheet differs somewhat from the other information sheets in this chapter.

OBJECTIVES:

Employee training should be based on four objectives:

< Promote a clear identification and understanding of the problem, including activities with the potential to pollute stormwater;
< Identify solutions (BMPs);
< Promote employee ownership of the problems and the solutions; and
< Integrate employee feedback into training and BMP implementation.

APPROACH:

< Integrate training regarding stormwater quality management with existing training programs that may be required for other regulations.
< Employee training is a vital component of many of the individual source control BMPs included in this manual.

PROGRAM ELEMENTS

: New Development
: Residential
: Commercial Activities
: Industrial Activities
: Municipal Facilities
: Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
Nutrients
Heavy Metals
Toxic Materials
Oxygen Demanding Substances
Oil & Grease
Floatable Materials
Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

: Capital Costs
: O&M Costs
9 Regulatory
Training
: Staffing
: Administrative

■ High ☒ Medium ☐ Low

April 12, 2010

INTENT

The purpose of this guidance is to provide Best Management Practices (BMPs) for use during emergency and non-emergency fire fighting activities that have the potential to create non-storm water runoff. These BMPs seek to implement the requirements of the City of South Salt Lake Storm Water System Code Title 13 Chapter 8 "Illicit Discharges and connections". These BMPs, when followed, will minimize discharges to the City of South Salt Lake Storm Water System associated with fire prevention, firefighting, fire training, emergency scene spills or discharges and fire facility maintenance activities.

PROCEDURE

Non-Emergency Firefighting Runoff Control

1. Discharges Associated With Fire Training Activities

Training activities which simulate emergency responses must be performed in a manner that reduces or prevents discharges to the storm drain system to the maximum extent practicable. In addition, when the elimination of discharges into the storm drain system is unavoidable (i.e. equipment failures), measures will be implemented to minimize impacts to water quality:

- Live and simulated fire training should be conducted, where feasible, in facilities where runoff controls protecting the storm drain system have been engineered and built into the facility.
- If training is conducted at other types of locations, survey the area prior to the training exercise to ensure that debris will not enter storm drains during the drill.
- Use fog streams or straight streams for short durations when practicable.
- Prevent discharge of foam or other additives to storm drains. If training activities involve the use of foam, block off all potentially affected storm drain inlets and divert flows to the

sewer contact Storm Water Department if necessary at 801-483-6045

- If spraying water over a landscaped area or greenbelt, spray in an arch so that the velocities are dissipated and erosion is minimized.

2. Discharges Associated with Activities Conducted at Fire Facilities

A. Fire Apparatus, Equipment, and Hose Washing and Cleaning

- Conduct fire apparatus, equipment, and hose washing where detergents are used indoors wherever feasible.
- If the use of indoor facilities is unfeasible, use designated wash areas (preferably covered and bermed) to contain and/or divert wash water with detergents to the sewer either through the use of "wet-vac" or through a plumbed sanitary sewer connection; or direct wash water into landscaped areas (i.e., swales or infiltration basins).

B. Fire Apparatus and Equipment Maintenance and Repair

The following BMPs should be considered in order to prevent or reduce the discharge of pollutants to the storm drain system from fire apparatus and equipment maintenance and repair:

- Conduct fire apparatus and equipment maintenance indoors wherever feasible.
- If use of indoor areas is unfeasible, conduct fire apparatus and equipment maintenance in areas where precautions have been taken to prevent spills from entering storm drains.
- Use absorbent materials on small spills and use drip pans under fire apparatuses during repair when practicable.
- Remove absorbent materials promptly if these have been applied, and dispose of properly.

C. Outdoor Facility Maintenance

The following BMPs should be considered in order to prevent or reduce the discharge of pollutants to the storm drain

system during facility maintenance:

- Use dry cleaning methods, such as sweeping, to clean outside areas such as driveways, patios, and walkways. Place sweepings and debris in receptacles for solid waste disposal.
- Do not use detergents to wash outside pavement areas if these areas discharge off-site, into storm drains, or sub-surface seepage bed. Small amounts of detergent laden wash water can be directed on to landscaping or into swales.
- Maintain landscaped areas as required, and prevent the Discharge of litter, wastes, or other pollutants into storm drains.
- Monitor and maintain landscape irrigation systems to minimize runoff.
- Maintain and repair buildings and other facilities in order to prevent the release of water, soils, or wastes into storm drains.

D. Solid Waste, Recycling, and Hazardous Materials Storage

The following BMPs should be considered in order to prevent or reduce the discharge of pollutants to storm drains from solid waste, recycling, or hazardous materials:

- Store hazardous materials in their original containers and provide indoor storage or, for outdoor storage locations, provide a covered, secure shelter.
- Provide secondary containment (i.e. a metal or plastic pan with a raised edge) for hazardous waste storage.
- Ensure dumpsters have covers and contain no liquid wastes.
- Other trash receptacles (e.g., cans, recycling containers, etc.) should be stored indoors or, if located outdoors, long term storage containers should have lids or covered shelters to prevent contact with rainfall and reduce leakage. This does not apply to temporary, curb-side collection of trash and recycling.

Emergency Fire Fighting Runoff Control

An "emergency" exists from alarm notification until, in the opinion of the incident commander, the emergency has concluded and emergency equipment is returned to the station. Discharges occurring during emergency fire fighting activities (i.e. flows necessary for the protection of

life and property) do not require BMPs and are not prohibited under the City of South Salt Lake Storm Water System Code Title 13 Chapter 80 "Illicit Discharges and connections". However, when and where possible and practicable, and when not interfering with health and safety, implementation of all applicable BMPs should be considered.

1. Discharges Associated with Emergency Fire Fighting Activities

   To the extent allowed by the circumstances at the scene and without compromising the health and safety of personnel or the public, emergency fire fighting activities should be performed in a manner that avoids or minimizes discharges to the storm drain system.

2. Discharges Associated with Hazardous Materials Spills

   The City of South Salt Lake Fire Department is a designated regional response agency with responsibilities as outlined in the NFPA 472 Standard for Professional Competence of Responders to Hazardous Material Incidence. The City of South Salt Lake Fire Department and safety personnel are trained to respond to hazardous material spills according to response protocols established by these coordination and response protocols.

Post-Emergency Fire Fighting Runoff Control

The post-emergency rehabilitation and maintenance of response

equipment must be performed in a manner that complies with City Code 13.80.

IMPLEMENTATION STRATEGY

Education, Training, and Outreach

1. **Storm water NPDES Training** - Fire department personnel should

   receive annual education and training to increase awareness and

   understanding of storm water pollution issues, non-storm water

   disposal requirements, BMPs, and their compliance obligations.

2. **Best Management Practices (BMPs) Update** - The City of South Salt Lake Storm Water Department will continue to work cooperatively with the City of South Salt Lake Fire Department to identify, update, and provide guidance on the implementation BMPs, as appropriate, to reduce contaminants in discharges related to fire department agency activities to the maximum extent practicable.

BMP: Grading Practices

GP

Soils exposed from land grading activities are very vulnerable to erosion

Applications

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment
- ☐ Housekeeping Practices

Description:

Control soil erosion by minimizing the exposure of bare soil to erosive forces. This is done by

1) limiting the amount of land disturbed at one time in preparation for construction
2) limiting the amount of time between the disturbance of soil and protection or stabilization of disturbed soils, and
3) using grading practices to protect exposed soils susceptible to storm water runoff.

Related practices include construction sequencing, preservation of existing vegetation, erosion control practices and sediment control practices.

Approach:

- Limit the area of disturbance to those areas requiring grading. This preserves existing vegetation and reduces the vulnerability of soil to erosion.
- Based on erosion potential and sediment control measures on the site, establish what areas are to be graded at one time.
- An undisturbed buffer zone containing vegetation at the lowest elevation of a construction site can reduce the transport of sediment off site.
- Initiate soil protection measures during the course of work to minimize the length of time soil is exposed to erosive forces.
- Conduct work in stages so that construction or soil stabilization occurs promptly after disturbance of soil.
- Establish a schedule governing the stabilization of disturbed slopes, both in terms of passage of time since commencement and completion of disturbance and in terms of planting season.
- Leaving the surface of the disturbed soil graded in a roughened condition (not smooth) can reduce the quantity and velocity of storm water runoff.
- Prevent storm water runoff from running onto steep slopes from above,
- Avoid long, steep cut or fill slopes that allow runoff water of sufficient quantity or velocity to cut into and erode the slope.

Limitations:

- The specific approach to grading on a particular site depends on the conditions of the site and surrounding land; engineering judgment is required to design the approach best suited for each site.

Maintenance:

- Practices may need to vary from the approved plan if erosion problems appear when storm water runoff occurs.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

BMP: Green Waste

GW

Applications

- ☐ Manufacturing
- ■ Material Handling
- ■ Vehicle Maintenance
- ☒ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

Description:

This program consists of planning and implementing a program to collect and process green waste for re-use in the community. It should include a plan of who will collect the waste, education on what kinds of waste are acceptable, a schedule for green waste collection times, and plans for the green waste processing location and procedure.

Approach:

- Decide what types of green waste can be re-used in the community.
- Identify a location where green waste can be taken and processed.
- Acquire the equipment necessary to process the green waste.
- Decide who will collect the green waste and when it will be collected
- Develop an advertisement plan to make sure that members of the community know that the service exists.
- Create an education plan to teach the community what kinds of green waste can be processed and re-used.
- Plan a method to fund the green waste program.

Limitations:

- Property must be available to provide a place to store and process the green waste.

Maintenance:

- Equipment used to collect and process green waste must be maintained.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ☒ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☐ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Hydromulching

HM

OBJECTIVES

- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas
- ☒ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

DESCRIPTION:

A combination of wood fiber mulch, processed grass, or hay or straw mulch and a tacking agent. It is made into a slurry, then applied to bare slopes or other bare areas to provide temporary stabilization.

APPLICATIONS:

- Small roadside slopes.
- Large, relatively flat areas.

INSTALLATION/APPLICATION CRITERIA:

- Legume seeds should be pellet inoculated with the appropriate bacteria.
- The seed should not remain in the hydromulcher tank for more than 30 minutes.
- Wood fiber may be dyed to aid in uniform application.
- Slurry should be uniformly applied until an adequate coverage is achieved.
- The applicator should not be directed at one location for a long period of time; erosion will occur.

LIMITATIONS:

- Will lose effectiveness after 1 year.
- Can use only on physically stable slopes (at natural angle of repose, or less).

MAINTENANCE:

- Periodically inspect for damage caused by wind, water, or human disturbance.
- Promply repair damaged areas.

TARGETED POLLUTANTS

- ☒ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ■ Floatable Materials
- ☐ Other Waste

IMPLEMENTATION REQUIREMENTS

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

BMP: Housekeeping Practices

HP

DESCRIPTION:

Promote efficient and safe housekeeping practices (storage, use, and cleanup) when handling potentially harmful materials such as fertilizers, pesticides, cleaning solutions, paint products, automotive products, and swimming pool chemicals.

APPROACH:

< Pattern a new program after the many established programs from municipalities around the country. Integrate this best management practice as much as possible with existing programs at your municipality.

< This BMP has two key audiences: municipal employees and the general public.

< For the general public, municipalities should establish a public education program that provides information on such items as storm water pollution and beneficial effects of proper disposal on water quality; reading product labels; safer alternative products; safe storage, handling, and disposal of hazardous products; list of local agencies; and emergency phone numbers. The programs listed below have provided this information through brochures or booklets that are available at a variety of locations including municipal offices, household hazardous waste collection events or facilities, and public information fairs.

Municipal facilities should develop controls on the application of pesticides, herbicides, and fertilizers in public right-of-ways and at municipal facilities. Controls may include:

< List of approved pesticides and selected uses.
< Product and application information for users.
< Equipment use and maintenance procedures.
< Record keeping and public notice procedures.

LIMITATIONS:

There are no major limitations to this best management practice.

PROGRAM ELEMENTS

☐ New Development
☒ Residential
☐ Commercial Activities
☐ Industrial Activities
☒ Municipal Facilities
☐ Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
Nutrients
9 Heavy Metals
Toxic Materials
Oxygen Demanding Substances
Oil & Grease
9 Floatable Materials
9 Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

9 Capital Costs
: O&M Costs
9 Regulatory
Training
: Staffing
9 Administrative

■ High ☒ Medium ☐ Low

BMP: Hazardous Waste Management

HWM

Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment

Description:

Prevent or reduce the discharge of pollutants to stormwater from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

Application:

Many of the chemicals used on-site can be hazardous materials which become hazardous waste upon disposal. These wastes may include:

- Paints and solvents, petroleum products such as oils, fuels and greases, herbicides and pesticides, acids for cleaning masonry, and concrete curing compounds.

In addition, sites with existing structures may contain wastes which must be disposed of in accordance with federal, state and local regulations, including:

- Sandblasting grit mixed with lead, cadmium or chromium based paints, asbestos, and PCBs.

Installation/Application Criteria:

The following steps will help reduce stormwater pollution from hazardous wastes:

- Use all of the product before disposing of the container.
- Do not remove the original product label, it contains important safety and disposal information.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with Federal and State regulations.

Limitations:

Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.

Maintenance:

- Inspect hazardous waste receptacles and areas regularly.
- Arrange for regular hazardous waste collection.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

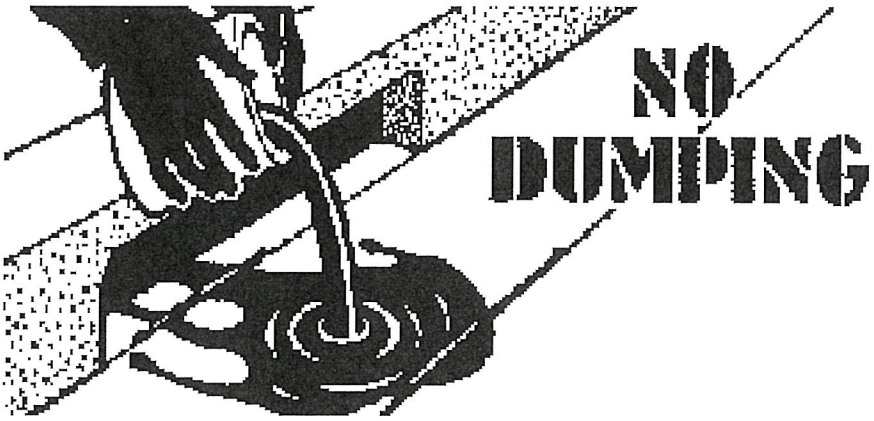
- ☐ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

Implementation Requirements

- ☐ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☒ Training

BMP: Illegal Dumping Controls

IDC



DESCRIPTION:

Implement measures to detect, correct, and enforce against illegal dumping of pollutants on streets, into the storm drain system, and into creeks. Substances illegally dumped on streets, into the storm drain system, and into creeks includes paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. All of these wastes can cause storm water and receiving water quality problems as well as clog the storm drain system.

APPROACH:

One of the keys to success is increasing the general public=s awareness of the problem and to at least identify the incident, if not correct it. There are a number of ways of accomplishing this:

< Train municipal staff from all departments to recognize and report incidents.
< Deputize municipal staff who may come into contact with illegal dumping with the authority to write illegal dumping tickets for offenders caught in the act.
< Educate the public.
< Provide the public with a mechanism for reporting such as a hot line.

Establish system for tracking incidents which will identify:

< Illegal dumping Ahot spots@,
< Types and quantities (in some cases) of wastes,
< Patterns in time of occurrence (time of day/night, month, or year),
< Mode of dumping (abandoned containers, Amidnight dumping@ from moving vehicles, direct dumping of materials, accident/spills), and
< Responsible parties.

A tracking system also helps manage the program by indicating trends, and identifying who, what, when, and where efforts should be concentrated.

LIMITATIONS

The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal.

PROGRAM ELEMENTS

9 New Development
9 Residential
9 Commercial Activities
9 Industrial Activities
9 Municipal Facilities
: Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

: Sediment
9 Nutrients
: Heavy Metals
Toxic Materials
Oxygen Demanding Substances
Oil & Grease
Floatable Materials
: Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

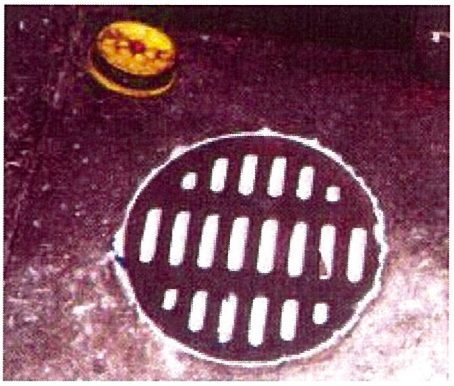
IMPLEMENTATION REQUIREMENTS

9 Capital Costs
: O&M Costs
9 Regulatory
Training
: Staffing
9 Administrative

■ High ☒ Medium ☐ Low

BMP: Identifying Illicit Connections

IIC



Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☐ Housekeeping Practices

Description:

Involves the identification and elimination of illegal or inappropriate connections of industrial and business wastewater sources to the storm drain system. It attempts to prevent contamination of ground and surface water supplies by regulation, inspection, and removal of these connections. The large amount of storm and sanitary sewer pipes in a community creates a complex and often confusing system of utilities, so it is not unusual for improper connections to occur.

Approach:

- Discharges from industry and business may come from a variety of sources including process wastewater, wash waters, and sanitary wastewater. The following methods are often used for identifying improper industrial discharges to the storm drain system
- *Visual Inspection*. A physical examination of piping connections or analysis by closed circuit camera is used to identify possible illicit connection sites.
- *Piping Schematic Review*. Architectural plans and plumbing details are examined for potential sites where improper connections have occurred.
- *Smoke Testing*. Smoke testing is used to locate connections by injecting a non-toxic vapor (smoke) into the system and following its path of travel.
- *Dye Testing*. Colored dye is added to the drain water in suspect piping. Dyed water appearing in the storm drain system indicates an illegal connection, possibly between the sanitary sewer system and the storm drain.
- Instituting building and plumbing codes to prevent connections of potentially hazardous pollutants to storm drains.
- *Flow Monitoring*. Monitoring increases in storm sewer flows during dry periods can also lead investigators to sources of infiltration due to improper connections.
- *Inspection using video equipment*
- Instituting building and plumbing codes to prevent connections of potentially hazardous pollutants to storm drains.

Limitations:

- A local ordinance is necessary to provide investigators with access to private property in order to perform field tests (Ferguson et al. 1997).
- Rain fall can hamper efforts to monitor flows and visual inspections.

Maintenance:

- Identifying illicit discharges requires teams of at least two people (volunteers can be used), plus administrative personnel, depending on the complexity of the storm sewer system.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☐ Sediment
- ■ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ■ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

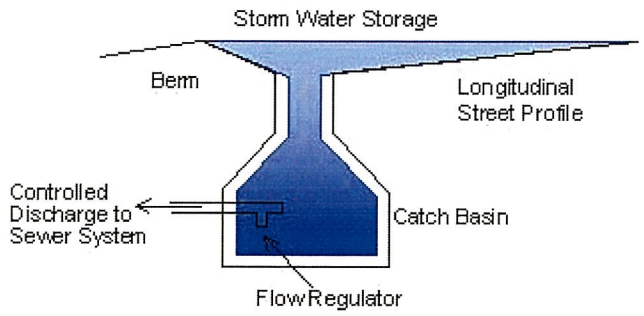
Implementation Requirements

- ■ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: In-Line Storage

ILS



Note: Not to scale and great vertical exaggeration

Catch basins can be equipped with flow restrictors to temporarily detain storm water in the conveyance system

APPLICATIONS

- ☒ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

DESCRIPTION:

In-line storage refers to a number of practices designed to use the storage within the storm drain system to detain flows. While these practices can reduce storm peak flows, they are unable to improve water quality or protect downstream channels. Devices can slow the rate of flow by backing up flow, as in the case of a dam or weir, or through the use of vortex valves, devices that reduce flow rates by creating a helical flow path in the structure.

APPROACH:

- In-line storage practices serve the same purpose as traditional detention basins
- These practices can act as a surrogate for aboveground storage when little space is available for aboveground storage facilities.

LIMITATIONS:

- In-line storage practices only control flow, and thus are not able to improve the water quality of storm water runoff.
- If improperly designed, these practices may cause upstream flooding.
- Flow regulators cannot be applied to all storm drain systems. In older cities, the storm drainpipes may not be oversized, and detaining storm water within them would cause upstream flooding.

MAINTENANCE:

- Flow regulators require very little maintenance, because they are designed to be "self - cleaning," much like the storm drain system.
- For some designs, such as check dams, regulations will require only moderate construction in order to modify the structure's design.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ☒ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: BMP Inspection and Maintenance

IM

Applications

- ☐ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment

Description:

Inspect and maintain all structural BMP's (both existing and new) on a routine basis to remove pollutants from entering storm drain inlets. This includes the establishment of a schedule for inspections and maintenance.

Approach:

Regular maintenance of all structural BMP's is necessary to ensure their proper functionality.

- Annual inspections.
- Prioritize maintenance to clean, maintain, and repair or replace structures in areas beginning with the highest pollutant loading.
- Clean structural BMP's in high pollutant areas just before the wet season to remove sediments and debris accumulated during the summer and fall.
- Keep accurate logs of what structures were maintained and when they were maintained.
- Record the amount of waste collected.

Limitations:

- Cost
- Availability of trained staff

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ■ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

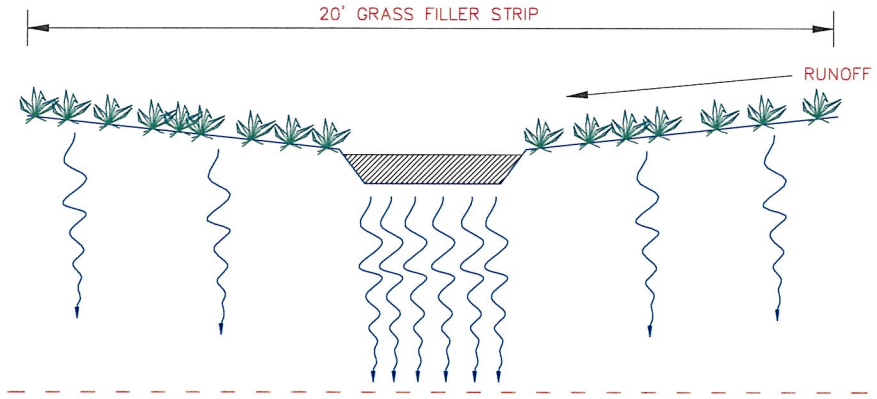
Implementation Requirements

- ■ Capital Costs
- ■ O&M Costs
- ☒ Maintenance
- ☒ Staffing
- ☐ Training
- ☐ Administrative

■ High ☒ Medium ☐ Low

BMP: Infiltration

IN



Considerations

: Soils

: Area Required

: Slope

9 Water Availability

9 Aesthetics

9 Hydraulic Head

: Environmental Side Effects

Description:

A family of systems in which the majority of the runoff from small storms is infiltrated into the ground rather than discharged to a surface water body. Infiltration systems include: ponds, vaults, trenches, dry wells, porous pavement, and concrete grids.

Application:

Suitable site soils and geologic conditions; low potential for long-term erosion in the watershed.

Installation/Application Criteria:

< Volume sized to capture a particular fraction of annual runoff.
< Pretreatment is necessary in fine soils.
< Emergency overflow or bypass for larger storms is needed.
< Observation wells are required in trenches.
< Infiltration surface must be protected during construction.
< Pond sides need vegetation to prevent erosion.
< During construction frequent inspection for clogging is necessary.
< Line sides of trench with permeable filter fabric
< Trench should be filled with clean washed stone or gravel. (1.5-3.0 in.)
< A six inch sand filter layer; cloth lines the bottom of trench.

Limitations:

< Loss of infiltrative capacity and high maintenance cost in fine soils.
< Low removal of dissolved pollutants in very coarse soils.
< Not suitable on fill sites or steep slopes.
< The risk of ground water contamination in very coarse soils, may require ground water monitoring.

Maintenance:

< Remove sediment at a frequency appropriate to avoid excessive concentrations of pollutants and loss of infiltrative capacity.
< Frequent cleaning of porous pavements is required.
< Maintenance is difficult and costly for underground trenches.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

Sediment
: Nutrients
Heavy Metals
Toxic Materials
Oxygen Demanding Substances
Oil & Grease
: Floatable Materials
Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

Implementation Requirements

Capital Costs
: O&M Costs
: Maintenance
9 Training

■ High ☒ Medium ☐ Low

BMP: Illegal Solids Dumping Control

ISDC

Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☒ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

Description:

By locating and correcting illegal dumping practices through education and enforcement measures, the many risks to public safety and water quality associated with illegal disposal actions can be prevented. Illegal dumping control is important to preventing contaminated runoff from entering wells and surface water, as well as averting flooding due to blockages of drainage channels for runoff.

Approach:

- Illegal dumping can occur in both urban and rural settings and can happen in all geographic regions.
- Illegal dumping control programs focus on community involvement and targeted enforcement to eliminate or reduce illegal dumping practices.
- Control programs use a combination of public education, citizen participation, site maintenance, and authorized enforcement measures to address illegal waste disposal.
- Issues that need to be examined when creating a program include the following: The locations of persistent illegal dumping activity
  Types of waste dumped and the profile of dumpers
- Possible driving forces behind illegal dumping such as excessive user fees, restrictive curbside trash pickup, or ineffective recycling programs, Previous education and cleanup efforts, Current control programs and local laws or ordinances addressing the problem, Sources of funding and additional resources that may be required.

Limitations:

- Illegal dumping is often spurred by cost and convenience considerations, and a number of factors encourage this practice
- A lack of understanding regarding applicable laws or the inadequacy of existing laws may also contribute to the problem.

Maintenance:

- Efforts need to be continual.

Targeted Pollutants

- ☐ Sediment
- ☒ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☒ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ■ Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

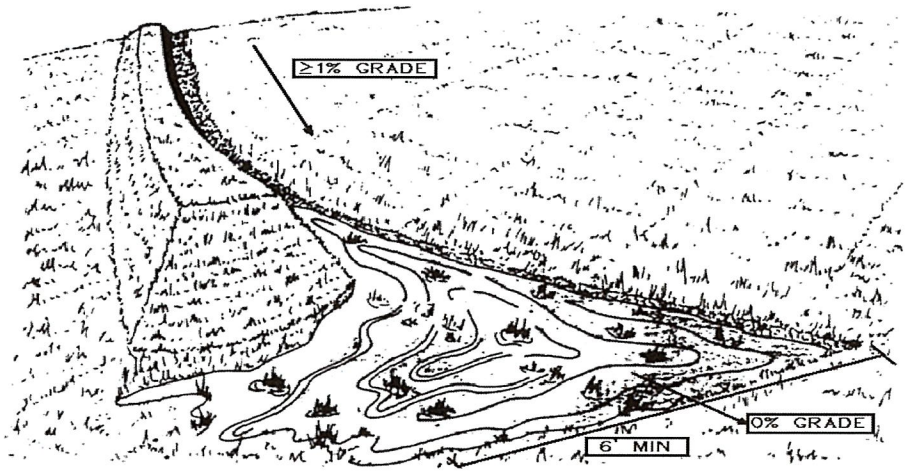
Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High	☒ Medium	☐ Low

BMP: Level Spreaders

LS



DESCRIPTION:

Level spreaders are devices used at stormwater outlets to spread out collected stormwater flows into sheetflow (runoff that flows over ground surface in a thin, even layer). Typically, a level spreader consists of a depression in the soil surface that spreads the flow onto a flat area across a gentle slope. Level spreaders then release the stormwater flow onto level areas stabilized by vegetation to reduce speed and increase infiltration.

APPLICATION:

Level spreaders are most often used as an outlet for temporary or permanent stormwater conveyances or dikes. Runoff that contains high sediment loads should be treated in a sediment trapping device prior to release into a level spreader.

INSTALLATION/APPLICATION CRITERIA:

< The length of the spreader depends upon the amount of water that flows through the conveyance.
< Larger volumes of water need more space to even out.
< Level spreaders are generally used with filter strips (see Filter Strips BMP).
< The depressions are seeded with vegetation (see Permanent & Temporary Seeding BMP).
< Level spreaders should be constructed on natural soils and not on fill material.
< The entrance to the spreader should be level so that the flow can spread out evenly.
< Level Spreader should have a grade of 0%; minimum width should be 6' and minimum depth should be 6" minimum.

LIMITATIONS:

< Can easily develop Ashort circuiting@ (concentration of flows into small streams instead of sheetflow over the spreader) because of erosion or other disturbance.
< Cannot handle large quantities of sediment-laden stormwater.

MAINTENANCE:

< The spreader should be inspected after every storm event to check for damage.
< If ponding or erosion channels develop, the spreader should be regraded.
< Dense vegetation should be maintained and damaged areas reseeded as needed.

CONSIDERATIONS

: Soils

: Area Required

: Slope

9 Water Availability

: Aesthetics

9 Hydraulic Head

: Environmental Side Effects

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
: Nutrients
9 Heavy Metals
9 Toxic Materials
: Oxygen Demanding Substances
9 Oil & Grease
9 Floatable Materials
9 Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

: Capital Costs
: O&M Costs
: Maintenance

■ High ☒ Medium ☐ Low

BMP: Long Term Operation and Maintenance

LTOM

Description:

Establishment and implementation of a schedule for long term operation and maintenance procedures for the existing storm drain system. The primary focus of this BMP is on structural BMPs installed by contractors, and developments that are left to be maintained by residents and businesses.

Approach:

- Review existing policy on who is responsible to maintain privately installed BMPs.
- Modify development agreements as necessary.
- Review existing maintenance schedule and/or efforts.
- Review the requirements necessary to maintain the existing storm drain system.
- Conduct periodic inspections of existing facilities. To determine if they are being maintained.
- Create a schedule for long term operation and maintenance of the storm drain system.
- Implement the maintenance schedule.
- Follow up.
- Possibly offer incentives for properly maintained BMPs or charge fees to maintain privately held facilities.

Limitations:

- Cost
- Availability of trained staff
- Difficulties in getting Home Owners Associations to do long term maintenance.

Applications

- ☐ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ☒ Nutrients
- ■ Heavy Metals
- ☐ Toxic Materials
- ☒ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ■ Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ■ O&M Costs
- ☒ Maintenance
- ☒ Staffing
- ☐ Training
- ☐ Administrative

■ High	☒ Medium	☐ Low

BMP: Land Use Planning/Management

LUPM

PROGRAM ELEMENTS

: New Development

9 Residential

9 Commercial Activities

9 Industrial Activities

9 Municipal Facilities

9 Illegal Discharges

DESCRIPTION:

This BMP represents an important opportunity to reduce pollutants in stormwater runoff by using a comprehensive planning process to integrate water quality concerns into the development and redevelopment process. It is applicable to all types of land use and represents one of the most effective pollution prevention practices.

APPROACH:

The land use planning process need not be complex. A basic schematic model involves:

< Phase I - Goals: Determine clear-cut water quality goals.
< Phase 2 - Study: Identify planning area, gather pertinent data, and write a description of the planning area and its associated problems.
< Phase 3 - Analysis and Synthesis: Determine and prioritize the water quality needs as they relate to land use.
< Phase 4 - Recommendations: Future courses of action are developed to address the identified problems and needs determined previously.
< Phase 5 - Adoption: The recommendations are presented to a political body for acceptance and implementation.
< Phase 6 - Implementation: Recommendations adopted by the political body are implemented by the locality.

LIMITATIONS:

< Land use planning/management frequently addresses sensitive public issues. Restrictions on certain land uses for the purpose of mitigating stormwater pollution may be politically unacceptable.
< The use of land use controls and planning for water quality improvements may be limited by the lack of staff to enforce various aspects of local zoning and building codes.
< The planning process addresses many public needs and legal requirements which often are in conflict with one another. It is difficult but extremely important to integrate and balance these sometimes competing programs.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
: Nutrients
Heavy Metals
Toxic Materials
9 Oxygen Demanding Substances
9 Oil & Grease
: Floatable Materials
9 Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

9 Capital Costs
9 O&M Costs
Regulatory
9 Training
: Staffing
9 Administrative

■ High ☒ Medium ☐ Low

BMP: Manure Composting Program

MCP

Applications

- ☐ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment

Description:

This program consists of educating local farmers of the effects untreated waste can have on water resources and the benefits of composting. It should include education on the various methods of composting including: active windrow (with turning), passive composting piles, passively aerated windrow (supplying air through perforated pipes embedded in the windrow), active aerated windrow (forced air), bins, rectangular agitated beds, silos, rotating drums, containers, anaerobic digestion, and vermin-compost (using earthworms). It could also include a program for sharing equipment or providing services for turning composting piles.

Approach:

- Manure collected in dairy operations contains 75-95 percent water and needs dewatering or addition of bulking material for proper composting.
- The composted material is odorless, fine-textured, and low-moisture and can be bagged and sold for use in gardens, or nurseries or used as fertilizer on cropland with little odor or fly breeding potential. Composting improves the handling characteristics of any organic residue by reducing its volume and weight
- The composting material should be turned whenever the temperature rises above 145÷F to prevent overheating, which kills the composting organisms
- The composted material also can be stored and applied when convenient.
- Weed seeds or pathogens that can create problems with application of manure or other organic residues should not be a concern when properly made compost is used.
- Composted manure is a more desirable fertilizer than raw manure because the heat of a compost pile kills most weed seeds and pathogens, allowing the composted manure to be applied to crops where raw manure cannot. The composting process also reduces manure volume by about 50 percent
- Over 70 per cent of the value of raw manure is lost when it is spread
- Raw manure can physically degrade soil. It can easily reduce soil volume by 10 - 15 per cent

Limitations:

- A storage area is required since composting can take around 6 months
- Care must be taken to compost correctly and produce a good compost.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☐ Sediment
- ■ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ☐ Oil & Grease
- ■ Floatable Materials
- ■ Bacteria & Viruses

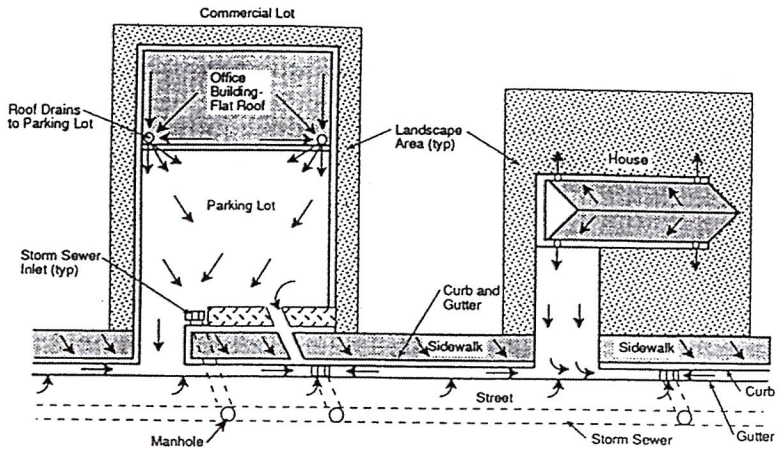
Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Minimizing Directly Connected Impervious Areas

MDCIA



CONSIDERATIONS

- ☐ Soils
- ☐ Area Required
- ☒ Slope
- ☐ Water Availability
- ☒ Aesthetics
- ☐ Hydraulic Head
- ☐ Environmental Side Effects

DESCRIPTION:

Minimizing directly connected impervious areas (DCIAs) is a structural BMP strategy that requires a basic change in drainage design philosophy. The basic principle is to direct stormwater runoff to landscaped areas, grass buffer strips, and vegetated swales to slow down the rate of runoff, reduce runoff volumes, attenuate peak flows, and encourage filtering and infiltration of stormwater.

APPLICATIONS:

It can be made an integral part of drainage planning for any development.

INSTALLATION/APPLICATION CRITERIA:

- Use on sites with general terrain slopes flatter than 3-4%.
- Design the site drainage flowpath to maximize flow over vegetated areas before leaving a site.
- Minimize ground slopes to limit erosion and slow down water flow.
- Select vegetation that will not only survive, but also enhance water quality.

LIMITATIONS:

- Potential increase in site open space requirements over the traditional development systems.
- Introduction of a nonconventional development design strategy.
- Infiltration of water near building foundations and parking lots is a concern.
- Will likely result in increased maintenance along the swales.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

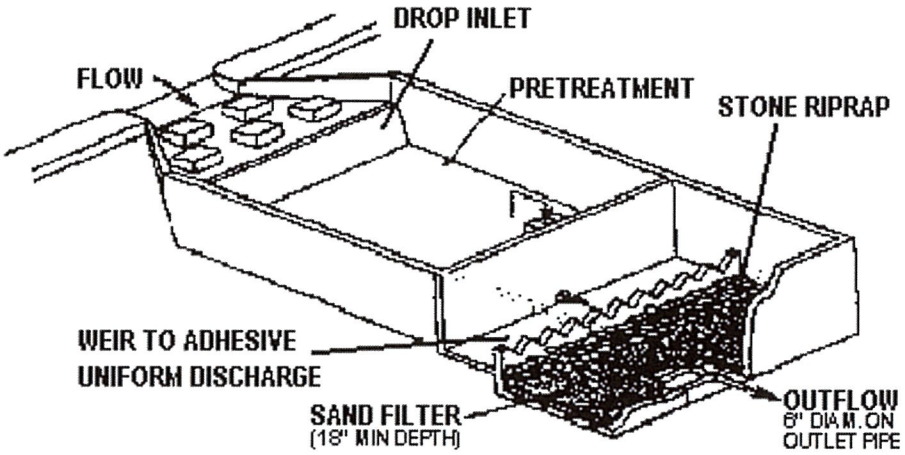
- ■ Sediment
- ☐ Nutrients
- ☒ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☒ Floatable Materials
- ☐ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

BMP: Media Filtration

MF



Considerations

- ☐ Soils
- ☐ Area Required
- ☐ Slope
- ☐ Water Availability
- ☐ Aesthetics
- ☒ Hydraulic Head
- ☐ Environmental Side Effects

Description:

Consists of a settling basin followed by a filter. The most common filter media is sand; some use peat/sand mixture.

Application:

- Objective is to remove only sediment (particulate pollutants).
- Use where unavailability of water prevents the use of wet ponds, wetlands, or biofilters.
- Can be placed underground.
- Suitable for individual developments and small tributary areas up to about 100 acres.
- May require less space than other treatment control BMPs.

Installation/Application Criteria:

- Settling basin smaller than wet or extended detention basin.
- Spread flow across filter.
- Place filter offline to protect from extreme events.
- Minimize erosion in settling basin.

Limitations:

- Filter may require more frequent maintenance than most of the other BMPs.
- Head loss.
- Dissolved pollutants are not captured by sand.
- Severe clogging potential if exposed soil surfaces exist upstream.

Maintenance:

Clean filter surface about twice annually; or more often if watershed is excessively erosive.

Targeted Pollutants

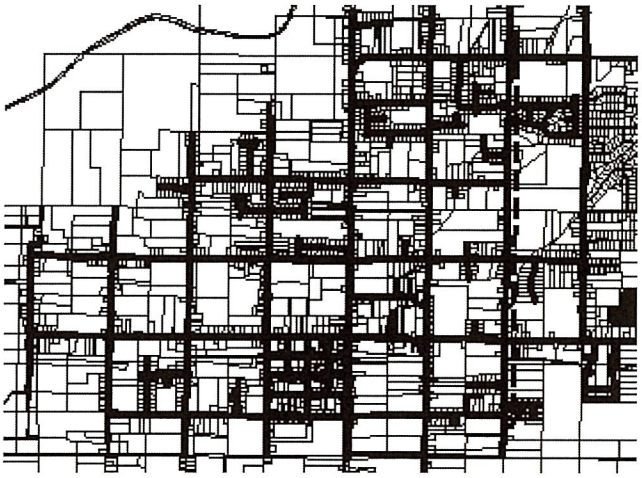
- ■ Sediment
- ☒ Nutrients
- ☒ Heavy Metals
- ☐ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☒ Oil & Grease
- ■ Floatable Materials
- ☒ Bacteria & Viruses

Implementation Requirements

- ■ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

BMP: Map Storm Water Drains

MSWD



Applications

☒Manufacturing
☐ Material Handling
☐ Vehicle Maintenance
☒ Construction
☒ Commercial Activities
☐ Roadways
☒ Waste Containment
☐ Housekeeping Practices

Description:

Develop an integrated storm water sewer system map that identifies existing piping, open cannels, storm drain outfalls, receiving water bodies and retention/detention basins.

Approach:

- Determine if effort will be out-sourced or completed in-house
- Compile existing drawings
- Gather drawings of new developments
- Convert drawings of new developments
- Identify any possible illegal discharges
- Use in determining possible causes of a pollution
- Require new developments to supply city with updated drainage maps to be integrated into the system.

Limitations:

- Some additional surveying may need to be done on existing structures
- Training may be required to familiarize with software

Maintenance:

- Map will need to be updated constantly as new developments arise
- Checks and changes may be necessary as as-builds and differences are discovered
- Inspection

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

☒ Sediment
☒ Nutrients
☒ Heavy Metals
☒ Toxic Materials
☒ Oxygen Demanding Substances
☒ Oil & Grease
☒ Floatable Materials
☒ Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

Implementation Requirements

☒ Capital Costs
☐ O&M Costs
☐ Maintenance
☐ Training

BMP: Mulching

MU

OBJECTIVES

- ■ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas
- ☒ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

DESCRIPTION:
Placement of material such as straw, grass, woodchips, woodfibers or fabricated matting over open area.

APPLICATION:
- Any exposed area to remain untouched longer than 14 days and that will be exposed less than 60 days (seed areas to be exposed in excess of 60 days).
- Areas that have been seeded.
- Stockpiled soil material.

Material	Application	Depth	Comments
Gravel:	9 cy/1000 sf	3 inches	Good for traffic areas
Washed 1/4" to 1-1/2"			Good for short slopes
Straw:	2-3 bales/1000 sf	2 inches	Subject to wind blowing
Air-dried, free of seeds		min.	Tack down or keep moist
and coarse material			
Wood Fiber Cellulose:	35 lb/1000 sf	1 inch	For critical areas, double application rate;
Free from growth inhibitors; dyed green			Limit to slopes < 3% and < 150 feet

TARGETED POLLUTANTS

- ■ Sediment
- ☒ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

INSTALLATION/APPLICATION CRITERIA:
- Roughen area to receive mulch to create depressions that mulch material can settle into.
- Apply mulch to required thickness and anchor as necessary.
- Ensure material used is weed free and does not contain any constituents that will inhibit plant growth.

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance

LIMITATIONS:
- Anchoring may be required to prevent migration of mulch material.
- Downgradient control may be required to prevent mulch material being transported to storm water system.

MAINTENANCE:
- Inspect mulched areas after every rainfall event and at a minimum of monthly.
- Replace mulch on any bare areas and reanchor as necessary.
- Clean and replace downgradient controls as necessary.

■ High ☒ Medium ☐ Low

BMP: Non-Stormwater Discharges To Drains

NSWD

APPLICATIONS

- ☒ Manufacturing
- ☐ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

DESCRIPTION:

Eliminate non-stormwater discharges to the stormwater collection system. Non-stormwater discharges may include: process wastewaters, cooling waters, wash waters, and sanitary wastewater.

APPROACH:

The following approaches may be used to identify non-stormwater discharges:

- Visual inspection: the easiest method is to inspect each discharge point during dry weather. Keep in mind that drainage from a storm event can continue for three days or more and groundwater may infiltrate the underground stormwater collection system.
- Piping Schematic Review: The piping schematic is a map of pipes and drainage systems used to carry wastewater, cooling water, sanitary wastes, etc... A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system. Inspect the path of floor drains in older buildings.
- Smoke Testing: Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems. During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.
- Dye Testing: A dye test can be performed by simply releasing a dye into either the sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

LIMITATIONS:

- Many facilities do not have accurate, up-to-date schematic drawings.
- Video and visual inspections can identify illicit connections to the storm sewer, but further testing is sometimes required (e.g. dye, smoke) to identify sources.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ☐ Sediment
- ■ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ■ Oil & Grease
- ☒ Floatable Materials
- ■ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☒ Training

BMP: Outdoor Loading/Unloading Of Materials

OLUM

Applications

- ☐ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment
- ☒ Housekeeping Practices

Description:

Prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Approach:

- Park tank trucks or delivery vehicles so that spills or leaks can be contained.
- Cover the loading/unloading docks to reduce exposure of materials to rain.
- A seal or door skirt between trailer and building can also prevent exposure to rain.
- Design loading/unloading area to prevent stormwater runon: grade/berm and position roof downspouts to direct stormwater away from loading/unloading areas.
- Contain leaks during transfer.
- Use drip pans under hoses.
- Make sure fork lift operators are properly trained.
- Train employees for spill containment and cleanup.

Limitations:

- Space and time limitations may preclude all transfers from being performed indoors or under cover.
- It may not be possible to conduct transfers only during dry weather.

Maintenance:

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks: valves, pumps, flanges, and connections.

Targeted Pollutants

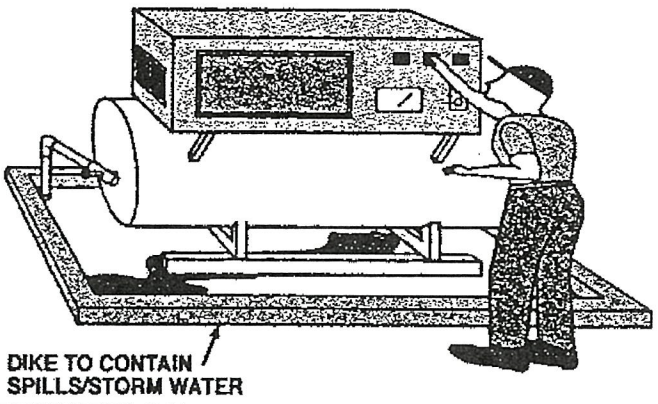
- ☐ Sediment
- ■ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

Implementation Requirements

- ■ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☒ Training

BMP: Outdoor Process Equipment Operations

OPE



APPLICATIONS

- ☒ Manufacturing
- ☐ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment
- ☒ Housekeeping Practices

DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from outdoor process equipment operations and maintenance by reducing the amount of waste created, enclosing or covering all or some of the equipment, installing secondary containment, and training employees.

APPROACH:

- Alter the activity to prevent exposure of pollutants to stormwater.
- Move activity indoors.
- Cover the area with a permanent roof.
- Minimize contact of stormwater with outside manufacturing operations through berming and drainage routing (runon prevention).
- Connect process equipment area to public sewer or facility wastewater treatment system.
- Clean the storm drainage system regularly.
- Use catch basin filtration inserts as a means to capture particulate pollutants.
- Some municipalities require that secondary containment areas (regardless of size) be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

LIMITATIONS:

- Providing cover may be expensive.
- Space limitations may preclude enclosing some equipment.
- Storage sheds often must meet building and fire code requirements.

MAINTENANCE:

Routine preventive maintenance, including checking process equipment for leaks.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

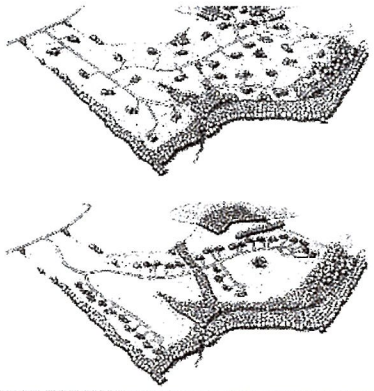
- ■ Sediment
- ☐ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ■ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ■ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☒ Training

BMP: Open Space Design

OSD



A site developed using open space design principles (bottom) maintains more undeveloped common space than the conventional development plan (top) (Source: Arendt, 1996)

Applications

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☒ Roadways
- ☐ Waste Containment
- ☒ Housekeeping Practices

Description:

Open space design, also known as conservation development or cluster development, is a better site design technique that concentrates dwelling units in a compact area in one portion of the development site in exchange for providing open space and natural areas elsewhere on the site. The minimum lot sizes, setbacks and frontage distances for the residential zone are relaxed in order to create the open space at the site. Open space designs have many benefits in comparison to the conventional subdivisions that they replace: they can reduce impervious cover, storm water pollutants, construction costs, grading, and the loss of natural areas.

Approach:

- It may be necessary to enact a new ordinance or revise current development regulations to enable developers to pursue this design option. Model ordinances and regulations for open space design
- The greatest storm water and pollutant reduction benefits typically occur when open space design is applied to residential zones that have larger lots (less than two dwelling units per acre). In these types of large lot zones, a great deal of natural or community open space can be created by shrinking lot sizes.
- In rural areas, open space design may need to be adapted, especially in communities where shared septic fields are not currently allowed by public health authorities.
- Other key elements of effective open space ordinances include requirements for the consolidation and use of open space, as well as enforceable provisions for managing the open space on a common basis.

Limitations:

- Some developers still feel that open space designs are less marketable than conventional residential subdivisions.
- The general public is often suspicious of cluster or open space development proposals, feeling that they are a "Trojan Horse" for more intense development, traffic, and other local concerns.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☒ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Outdoor Storage of Raw Materials

OSRM

Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment
- ☒ Housekeeping Practices

Description:

Prevent or reduce the discharge of pollutants to stormwater from outdoor materials and product storage areas by enclosing or covering materials, installing secondary containment, and preventing stormwater runon.

Approach:

Protect materials from rainfall, runon, runoff and wind dispersal:

- Store material indoors.
- Cover the storage area with a roof.
- Cover the material with a temporary covering made of polyethylene, polypropylene, or hypalon.
- Minimize stormwater runon by enclosing the area or building a berm around the area.
- Use a "doghouse" for storage of liquid containers.

- ➢ Parking lots or other surfaces near bulk materials should be swept periodically to remove debris blown or washed from storage area.
- ➢ Install pellet traps at stormwater discharge points where plastic pellets are loaded and unloaded.
- ➢ Keep liquids in a designated area on a paved impervious surface within a secondary containment.
- ➢ Keep outdoor storage containers in good condition.
- ➢ Use berms and curbing.
- ➢ Use catch basin filtration inserts.

Limitations:

- ➢ Space limitations may preclude storing some materials indoors.
- ➢ Some municipalities require that secondary containment areas (regardless of size) be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.
- ➢ Storage sheds often must meet building and fire code requirements.

Maintenance:

Berm and curbing repair and patching.

SOUTH SALT LAKE PUBLIC WORKS

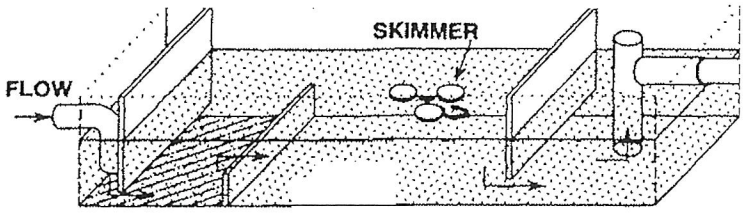
Targeted Pollutants

- ■ Sediment
- ☒ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

Implementation Requirements

- ☒ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☒ Training

BMP: Oil/Water Separators and Water Quality Inlets OWS



CONSIDERTIONS

D Soils
IZI Area Required
D Slope
D Water Availability
D Aesthetics
D Hydraulic Head
IZI Environmental Side Effects

DESCRIPTION:
Oil/Water separators are designed to remove a specific group of contaminants: petroleum compounds and grease. However, separators will also remove floatable debris and settleable solids. Two general types of oil/water separators are used: conventional gravity separator and the coalescing plate interceptor (CPI).

APPLICATION:
> Applicable to situations where the concentration of oil and grease related compounds is abnormally high and source control cannot provide effective control. The general types of businesses where this situation is likely are truck, car, and equipment maintenance and washing businesses, as well as businesses that perform maintenance on their own equipment and vehicles.
> Public facilities where separators may be required include marine ports, airfields,
fleet vehicle maintenance and washing, facilities, and mass transit park-and-ride lots.
> Conventional separators are capable of removing oil droplets with diameters
equal to or greater than 150 microns.
> A CPI separator should be used if smaller droplets must be removed.

INSTALLATION/APPLICATION CRITERIA:
> Sizing relates to anticipated influent oil concentration, water temperature and velocity, and the effluent goal.
> To maintain a reasonable separator size, it should be designed to bypass flows in
excess of first flush.

LIMITATIONS:
> The lack of data on oil characteristics in stormwater leads to considerable uncertainty about performance.
> An air quality permit may be required.

MAINTENANCE:
Clean frequently of accumulated oil, grease, and floating debris.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

IBI Sediments
IBI Nutrients
IBI Heavy Metals
IBI Toxic Materials
IBI Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials

D Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

Capital Costs
IBI O&M Costs
IBI Maintenance
Training

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

BMP: Pest Control

PC

The use of pesticides, such as those pictured here, should be limited to avoid runoff contamination

APPLICATIONS

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☐ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

DESCRIPTION:

Involves limiting the impact of pesticides on water quality by educating residents and businesses on alternatives to pesticide use and proper storage and on application techniques. The presence of pesticides in storm water runoff has a direct impact on the health of aquatic organisms and can present a threat to humans through contamination of drinking water supplies.

APPROACH:

- The use of integrated pest management (IPM) is a popular way for program managers to educate residents and businesses on alternatives to chemical pesticides.
- IPM reflects a holistic approach to pest control that examines the interrelationship between soil, water, air, nutrients, insects, diseases, landscape design, weeds, animals, weather, and cultural practices to select an appropriate pest management plan..
- An IPM program incorporates preventative practices in combination with non-chemical and chemical pest controls to minimize the use of pesticides and promote natural control of pest species.
- Three different non-chemical pest control practices biological (good bugs that eat pests), cultural (handpicking of pests, removal of diseased plants, etc.), and mechanical (zappers, paper collars, etc) are used to limit the need for chemicals.
- In those instances when pesticides are required, programs seek to have users try less toxic products such as insecticidal soaps.

- Education on the proper use of pesticides is often included in many lawn care and landscaping management programs.

LIMITATIONS:

- The public perception that no alternative to pesticide use exists is probably the greatest limitation that program managers will face.
- The time required for homeowners to learn more about alternative pest control techniques may also limit program effectiveness.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ☐ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

■ High ☒ Medium ☐ Low

BMP: Post Construction Site Plan Review

PCSPR

Applications

- ☐ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

Description:

Establishment and implementation of a schedule for long term operation and maintenance procedures for the existing storm drain system. The primary focus of this BMP is on structural BMPs installed by contractors, and developments that are left to be maintained by the MS4 or by residents and businesses.

Approach:

- Review existing policy on who is responsible to maintain privately installed BMPs.
- Create or modify Development Agreements as necessary.
- Review existing maintenance schedule and/or efforts.
- Review the requirements necessary to maintain the existing storm drain system.
- Conduct periodic inspections of existing facilities. To determine if they are being maintained.
- Create a schedule for long term operation and maintenance of the storm drain system.
- Implement the maintenance schedule.
- Follow up.
- Possibly offer incentives for properly maintained BMPs or charge fees to maintain privately held facilities.

Limitations:

- Cost
- Access and ownership issues
- Availability of trained staff
- Difficulties in getting Home Owners Associations to do long term maintenance.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ☒ Nutrients
- ■ Heavy Metals
- ☐ Toxic Materials
- ☒ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ■ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

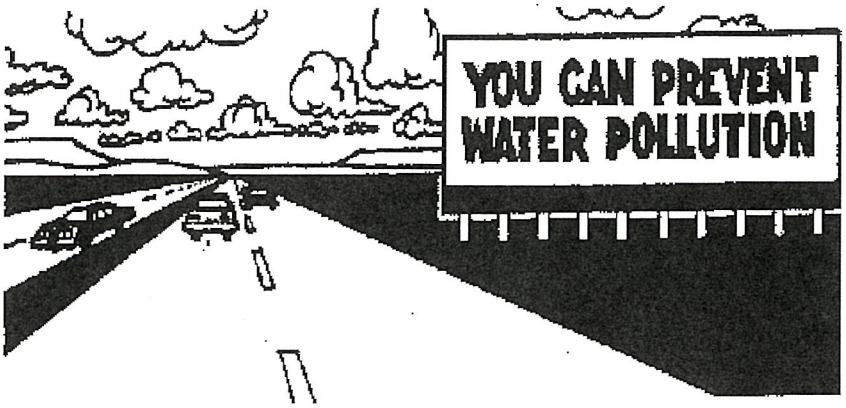
Implementation Requirements

- ☒ Capital Costs
- ■ O&M Costs
- ☒ Maintenance
- ☒ Staffing
- ☐ Training
- ☐ Administrative

■ High ☒ Medium ☐ Low

BMP: Public Education/Participation

PEP



DESCRIPTION:

Public education/participation, like an ordinance or a piece of equipment, is not so much a best management practice as it is a method by which to implement BMPs. This information sheet highlights the importance of integrating elements of public education and participation into a municipality=s overall plan for stormwater quality management.

A public education and participation plan provides the municipality with a strategy for educating its employees, the public, and businesses about the importance of protecting stormwater from improperly used, stored, and disposed of pollutants. Municipal employees must be trained, especially those that work in departments not directly related to stormwater but whose actions affect stormwater. Residents must become aware that a variety of hazardous products are used in the home and that their improper use and disposal can pollute stormwater. Increased public awareness also facilitates public scrutiny of industrial and municipal activities and will likely increase public reporting of incidents.

APPROACH:

< Pattern a new program after the many established programs around the country.
< Implement public education/participation as a coordinated campaign in which each message is related to the last.
< Present a clear and consistent message and image to the public regarding how they contribute to stormwater pollution and what they can do to reduce it.
< Utilize multi-media to reach the full range of audiences.
< Translate messages into the foreign languages of the community to reach the full spectrum of your populace and to avoid misinterpretation of messages.
< Create an awareness and identification with the local watershed.
< Use everyday language in all public pieces. Use outside reviewers to highlight and reduce the use of technical terminology, acronyms, and jargon.
< Make sure all statements have a sound, up-to-date technical basis. Do not contribute to the spread of misinformation.
< Break complicated subjects into smaller more simple concepts. Present these concepts to the public in a metered and organized way to avoid Aoverloading@ and confusing the audience.

LIMITATIONS:

None

PROGRAM ELEMENTS

9 New Development
: Residential
: Commercial Activities
9 Industrial Activities
: Municipal Facilities
: Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
Nutrients
Heavy Metals
Toxic Materials
Oxygen Demanding Substances
Oil & Grease
Floatable Materials
Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

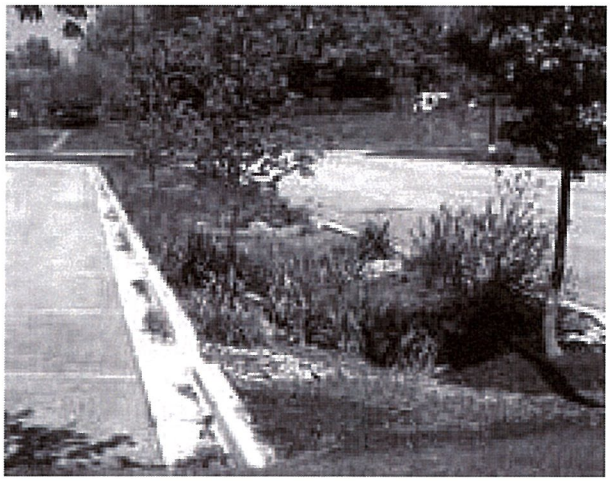
IMPLEMENTATION REQUIREMENTS

Capital Costs
: O&M Costs
9 Regulatory
: Training
: Staffing
: Administrative

■ High ☒ Medium ☐ Low

BMP: Parking Lot Design

PLD



APPLICATIONS

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment

DESCRIPTION:

Consider available design options to reduce the quantity and improve the quality of storm water runoff from parking lots. Related practices include filter strips, biofilters, grassed swales, and sediment traps.

CONSIDERATIONS:

- Shared parking reduces the total number of parking spaces needed for businesses adjacent to each other or to a parking area. Businesses having parking demand during the day on weekdays (such as office buildings) can often share parking spaces with businesses having weekend or evening parking demand (such as restaurants or movie theaters).
- The use of landscaped islands in parking lots reduces to the total impervious area of the parking lot, reducing the quantity of storm water runoff
- Some parking lots can be designed such that storm water runoff flows across a landscaped area prior to being collected. This can both reduce the quantity of runoff and improve the quality of runoff.
- Include structural practices in parking lot design to reduce storm water runoff contamination. Examples include sediment traps in inlet boxes, oil/water separators, water quality inlets, and passing storm water over vegetation.
- Parking lots should not be larger than is necessary—they should provide adequate, but not excessive, parking.
- Technologies are available that allow for a natural turf surface on parking lots. Such surfaces support traffic loads and can be plowed of snow in the winter. They are generally used for overflow parking but can be used for primary parking as well. Grass pavement can both reduce storm water runoff and improve storm water runoff quality.

LIMITATIONS:

- Parking lot design is specific to each development site; some considerations may not apply on some sites.
- Shared parking is only viable where complimentary businesses are located adjacent to one another.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ■ Sediment
- ☐ Nutrients
- ☒ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ■ Oil & Grease
- ☒ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Parking Lot Sweeping/Vacuuming

PLSV

PROGRAM ELEMENTS

- ☐ New Development
- ☐ Residential
- ☒ Commercial Activities
- ☒ Industrial Activities
- ☒ Municipal Facilities
- ☒ Illegal Discharges

DESCRIPTION:
Reduce the discharges of pollutants to stormwater from parking lot surfaces by conducting parking lot cleaning on a regular basis.

APPROACH:
- Restrict parking prior to and during sweeping.
- Establish frequency of sweeping based on anticipated need and observations of debris or sediment accumulation
- Increase sweeping frequency just before the rainy season.
- Lots that generate greater amounts of debris or sediment must be swept more frequently. These include lots associated with or adjacent to recreational, commercial, or industrial areas, or other areas of high vehicle or pedestrian traffic.
- Keep accurate operation logs to track programs.
- Equipment selection can be key for this particular BMP. There are two types used, the mechanical broom sweepers (more effective at picking up large debris and cleaning wet streets), and the vacuum sweepers (more effective at removing fine particles and associated heavy metals). It may be useful to have the ability to use both kinds.

LIMITATIONS:
- Conventional sweepers are not able to remove oil and grease.
- Mechanical sweepers are not effective at removing finer sediments.
- Effectiveness may also be limited by parking lot conditions, presence of parked vehicles, presence of construction projects, climatic conditions and condition of curbs.

MAINTENANCE:
- Acquisition and maintenance of equipment is generally handled by the company hired to perform the sweeping/vacuuming.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

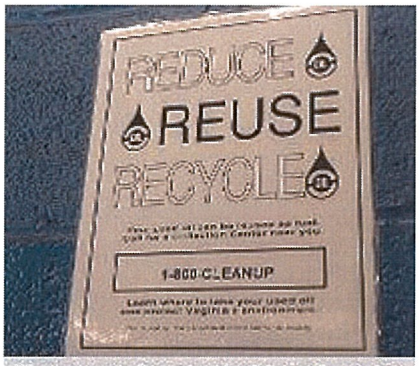
- ■ Sediment
- ■ Nutrients
- ■ Heavy Metals
- ☒ Toxic Materials
- ■ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☒ Floatable Materials
- ☐ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ☐ Capital Costs
- ☒ O&M Costs
- ☐ Regulatory
- ☐ Training
- ☐ Staffing
- ☒ Administrative

BMP: Promoting the Stormwater Message – Commercial Businesses

PSMCB



Signs can be posted to educate both employees and the public about the impacts of business activities on water quality

DESCRIPTION:

A successful outreach campaign must tailor its message to a targeted audience. The target audience may be industry or business groups whose activities influence the health of watersheds. Many commercial activities contribute to stormwater pollution (such as vehicle washing, landscape fertilization, and improper hazardous waste disposal). Therefore, it is important to address commercial activities specifically in an outreach strategy and recognize that in most cases incentives must be provided to encourage businesses to change their behavior.

APPROACH:

- Materials can be designed and produced to provided education and outreach including posters, magnets, calendars, fliers, brochures, and BMP fact sheets and handbooks.
- Target business include restaurants, auto maintenance, parking lots, gas stations, car washes, home mechanics, to name a few.
- Incentive programs can be put in place for compliance. Participants can be rewarded with technical assistance, promotional items, and public recognition

LIMITATIONS:

- There are many different types of commercial activities, and outreach programs might not be applicable to some of them. Before developing and implementing an outreach program, municipalities should prioritize business types that they think might impair water quality or that might be most receptive to outreach.
- Because the measures that the municipality proposes for businesses are voluntary, owners, operators, and employees must be convinced that changing their behavior is valuable and worth their efforts

PROGRAM ELEMENTS

: New Development

: Commercial Activities

: Industrial Activities

: Municipal Facilities

: Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ■ Sediment
- ■ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

■ High Impact

☒ Medium Impact

☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

- ■ Capital Costs
- ☐ O&M Costs
- ■ Regulatory
- ■ Training
- ☐ Staffing
- ☐ Administrative

■ High ☒ Medium ☐ Low

April 29, 2010

Parks maintenance operations have the potential to pollute stormwater as it flows out of landscaped areas or maintenance facilities into storm drains. Landscape chemicals and wastes can pollute storm water with sediments and toxins that can kill fish and wildlife and can harm humans. Fertilizers can contribute to algae blooms and deplete oxygen from receiving waters.

Best Management Practice

Best Management Practices (BMP's) are a voluntary practice that reduces water consumption and protects water quality. A BMP is economical, practical and sustainable, and maintains a healthy, functional landscape without exceeding the water requirements of the landscape, or efficient use of water within a facility

BEST MANAGEMENT PRACTICES (BMPS)

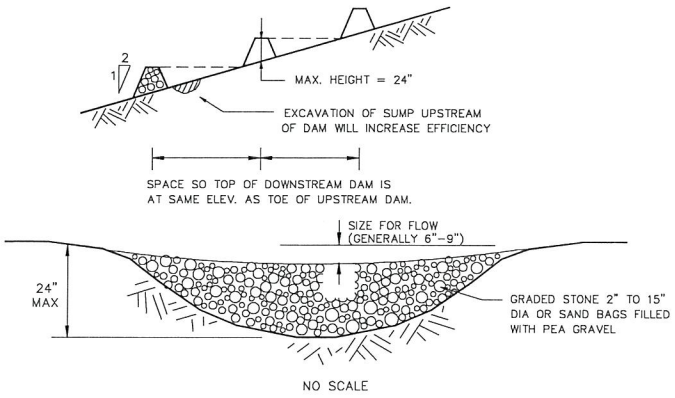
General	• Do not dump any liquids or other materials outside.
Fueling	• Keep a spill response kit at or near each fueling area. • Require that the person doing the fueling or liquid transfer remain present during entire fueling operation. ("Don't walk away!") • When fueling in the field from small containers, use a funnel or containers with spouts to prevent spills. • During bulk liquid (i.e. oil, gas or fertilizer) transfer, cover or berm around all down-gradient storm drain inlets within 25 feet. Keep all drain valves in liquid bulk containers and secondary containments locked in the closed position.

Landscaping, Lawn & Vegetation Maintenance	• Mulch-mow grass. • Avoid broadcast spraying of pesticides. Choose an appropriate method of application such that application does not exceed the problem area. *(Fertilizer may be broadcast sprayed.)* • Avoid spraying pesticides or fertilizers within 15 feet of any surface water or storm drainage structure (unless stricter limits apply). • Designate "no spray zones" and/or buffer areas around water features. • Follow all manufacturers' recommendations for mixing, applying, cleaning-up, storage and handling of pesticides and fertilizers. • Apply wastewater from rinsing pesticide containers on target pests or use it to dilute the next batch.
Material Storage, Loading & Unloading	• Do not store any liquids or other materials that could impact surface water outside unless adequate secondary containment and cover are provided or the container is specifically designed for outdoor storage. • Do not load or unload materials near a storm drain inlet or drainage ditch or over unpaved surfaces.
Pathway Construction	• When constructing or repairing paved pathways, use inlet protection devices such as gravel bags or covers to protect any storm drain inlets that are down stream of the work area or have the potential of being impacted by the work.
Spill Response	• Use spill prevention methods to ensure no hazardous materials reach the floor or ground. • Keep spill cleanup equipment in or near all work areas and use only "dry" cleanup methods to manage spills. • Develop a formal Spill Response Plan. Post the plan near spill cleanup materials.
Stormwater Runoff Prevention	• Maintain a map of the property, identifying directions of stormwater flow and storm drains. • Stencil (decal) storm drains on or near the facility.

Vehicle/Equipment Repair & Storage	• No maintenance or repair work is performed outside. (Only emergency repairs and maintenance activities that do not involve fluids may be performed outdoors.) • Do not store leaking vehicles or equipment outdoors. Contain the leak, repair immediately, or move indoors and repair.
Vehicle & Equipment Washing	• Hose off or brush off mowers (reels and decks) and tractors ONLY over grassy areas using no soap. Leave clippings on grassy areas or dispose of in trash or by composting. Do NOT hose off over paved or gravel areas! • Other vehicles (ex. pick-up trucks or on-road vehicles) must be washed in a designated washing area that drains to the sanitary sewer or must be driven off-site to a commercial or other designated car washing facility.
Graffiti Removal	• Graffiti removal activities are to be scheduled during dry weather. • When graffiti is removed by painting over, implement the procedures under Painting and Paint Removal. • Nearby storm inlets are to be protected prior to removing graffiti. Runoff from sand blasting and high pressure washing should be directed into a landscaped or dirt area. If such an area is not available filter runoff through an appropriate filtering device (e.g. filter fabric) to keep sand, particles and debris out of storm sewers. • When power washing using cleaning compounds, nearby storm inlets are to be plugged and water is to be vacuumed/pumped to the sanitary sewer. • Waterless and nontoxic chemical cleaning methods (e.g. gels or spray compounds) should be used when possible.
Paint and Paint Removal	• Paint and materials are to be transported to and from job sites in containers with secure lids and tied down to the vehicle. • Do not transfer or load paint near storm drain inlets or waterways. • Spray equipment is to be tested and inspected prior to starting to paint. Tighten all hoses and connections and do not overfill paint container. • Nearby storm drain inlets are to be plugged prior to starting painting in areas where there is a significant risk of a spill reaching the drain. Remove plugs when the job is complete. • Storm drain inlets are to be covered prior to sand blasting. • If a bridge crosses a waterway work should be performed on a maintenance traveler, platform or over suspended netting or tarps to capture paint, rust, paint removing agents or other materials to prevent discharge of materials to surface waters. If sanding, use a sander with a vacuum filter bag. • Capture all cleanup water and dispose of properly. • Unused paint will be taken to the Salt Lake County Household Hazardous Waste Facility.

BMP: Rock Check Dams

RCD



Objectives

- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas
- ☒ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Description:

A small, temporary dam constructed across a drainage ditch to reduce velocity of concentrated storm water flows, thereby reducing the erosion of the ditch.

Application:

- Temporary drainage paths
- Permanent drainage ways not yet stabilized
- Existing drainage paths receiving increased flows due to construction

Installation/Application Criteria:

- Prepare location of dam by removing any debris and rough grading any irregularities in channel bottom
- Place rocks by hand or with appropriate machinery, do not dump
- Construct dam with center lower to pass design flow
- Construct 50% side slopes on dam

Limitations:

- Maximum recommended drainage area is 10 acres
- Maximum recommended height is 24"
- Do not use in running stream

Maintenance:

- Inspect dams daily during prolonged rainfall, after each major rain event and at a minimum of once monthly.
- Remove any large debris and repair any damage to dam, channel or sideslopes
- Remove accumulated sediment when it reaches one half the height of the dam

Targeted Pollutants

- ■ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Riprap

RR

Considerations

: Soils
: Area Required
: Slope
9 Water Availability
: Aesthetics
9 Hydraulic Head
: Environmental Side Effects

Description:

Riprap is a permanent, erosion-resistant protective layer made of loose stones. It is intended to protect soil from erosion in areas of concentrated runoff. Riprap may also be used to stabilize slopes that are unstable because of seepage problems.

Application:

< Riprap is normally used at locations where erosive forces from water flow exceed the ability of the soil or vegetative cover to resist those forces.
< Riprap can be used for pipe outlet protection, channel lining, scour protection, etc.
< Riprap is commonly used for wave protection on lakes.

Installation/Application Criteria:

< For slopes steeper than 2:1, consider using materials other than riprap for erosion protection.
< If riprap is being planned for the bottom of a permanently flowing channel, the bottom can be modified to enhance fish habitat. This can be done by constructing riffles and pools which simulate natural conditions.
< When working within flowing streams, measures should be taken to prevent excessive turbidity and erosion during construction. Bypassing base flows or temporarily blocking base flows are two possible methods. Work should be done during a period of low flow.

In designing riprap consider the following:
< Use durable rock, such as granite, and a variety of rock sizes.
< The thickness of riprap layers should be at least 1.25 times the max. stone diameter.
< Filter material is usually required between riprap and the underlying soil surface.

Limitations:

< Riprap may be unstable on very steep slopes.
< The placement of a riprap in streams requires a state stream alteration permit.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

: Sediment
9 Nutrients
9 Heavy Metals
9 Toxic Materials
9 Oxygen Demanding Substances
9 Oil & Grease
9 Floatable Materials
9 Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

Implementation Requirements

: Capital Costs
: O&M Costs
: Maintenance

■ High ☒ Medium ☐ Low

BMP: Street Cleaning

SC

DESCRIPTION:

Reduce the discharges of pollutants to stormwater from street surfaces by conducting street cleaning on a regular basis.

APPROACH:

< Prioritize cleaning to use the most sophisticated sweepers, at the highest frequency, and in areas with the highest pollutant loading.
< Restrict street parking prior to and during sweeping.
< Increase sweeping frequency just before the rainy season.
< Proper maintenance and operation of sweepers greatly increase their efficiency.
< Keep accurate operation logs to track programs.
< Reduce the number of parked vehicles using regulations.
< Sweepers effective at removing smaller particles (less than 10 microns) may generate dust that would lead to concerns over worker and public safety.
< Equipment selection can be key for this particular BMP. There are two types used, the mechanical broom sweepers (more effective at picking up large debris and cleaning wet streets), and the vacuum sweepers (more effective at removing fine particles and associated heavy metals). Many communities find it useful to have a compliment of both types in their fleet.

LIMITATIONS:

< Conventional sweepers are not able to remove oil and grease.
< Mechanical sweepers are not effective at removing finer sediments.
< Effectiveness may also be limited by street conditions, traffic congestion, presence of construction projects, climatic conditions and condition of curbs.

MAINTENANCE:

< Replace worn parts as necessary.
< Install main and gutter brooms of the appropriate weight.

PROGRAM ELEMENTS

9 New Development
9 Residential
9 Commercial Activities
9 Industrial Activities
: Municipal Facilities
: Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
Nutrients
Heavy Metals
: Toxic Materials
Oxygen Demanding Substances
9 Oil & Grease
: Floatable Materials
9 Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

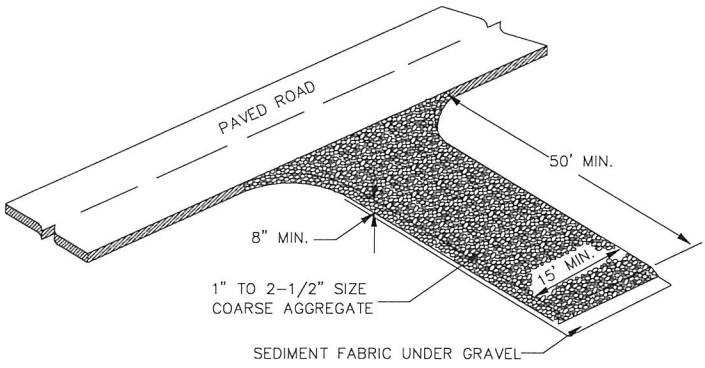
IMPLEMENTATION REQUIREMENTS

Capital Costs
O&M Costs
: Regulatory
: Training
Staffing
: Administrative

■ High ☒ Medium ☐ Low

BMP: Stabilized Construction Entrance and Wash Area

SCEWA



Objectives

- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☒ Control Site Perimeter
- ☐ Control Internal Erosion

Description:

A stabilized pad of crushed stone located where construction traffic enters or leaves the site from or to paved surface. The area can be used to spray off vehicles before they leave the site.

Applications:

At any point of ingress or egress at a construction site where adjacent traveled way is paved. Generally applies to sites over 2 acres unless special conditions exist.

Installation/Application Criteria:

- Clear and grub area and grade to provide maximum slope of 2%.
- Compact subgrade and place filter fabric if desired (recommended for entrances to remain for more than 3 months.
- Place coarse aggregate, 1 to 2-1/2 inches in size, to a minimum depth of 8 inches.
- Provide water to the area that can be used to spray off vehicles as needed to prevent the tracking of mud off of the construction site. This may not be needed during dry periods of work, but is needed when construction is proceeding under wet conditions.
- Provide berming as needed to prevent sediment laden wash water from entering storm water facilities or other water bodies, or leaving the site.

Limitations:

- Requires periodic top dressing with additional stones.
- Should be used in conjunction with street sweeping on adjacent public right-of-way.
- Must be situated such that was water does not run off site.

Maintenance:

- Inspect daily for loss of gravel or sediment buildup.
- Inspect adjacent roadway for sediment deposit and clean by sweeping or shoveling.
- Repair entrance and replace gravel as required to maintain control in good working condition.
- Expand stabilized area as required to accommodate traffic and prevent erosion at driveways.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Stream Cleanup and Monitoring

SCM

People can become involved in pollution prevention by volunteering to clean up streams (Source: Water Action Volunteers, 1998)

Applications

- ☒ Manufacturing
- ■ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ■ Waste Containment

Description:

Many people are unaware that most storm drains discharge untreated waters directly into local water bodies. A stream cleanup allows concerned citizens to become directly involved in water pollution prevention. Participants volunteer to walk (or paddle) the length of the stream or river, collecting trash and recording information about the quantity and types of garbage that has been removed.

Approach:

- Designating an individual or groups of individuals to schedule and organize the cleanup projects, recruit volunteers, coordinate trash disposal with the local solid waste authority, and assign staff for supervision of the projects.
- The first step for a municipally sponsored stream cleanup program is to identify cleanup sites
- Advertise the program and let service groups know about cleanup project opportunities
- When volunteers are being used for cleanup efforts, municipalities must address the issue of liability. An attorney should be consulted to determine how liability should be handled and draft a waiver for volunteers to sign before participating.
- Cleanup events are also effective at increasing public awareness of pollutant sources and fates, especially when knowledgeable municipal staff is on hand to answer questions, describe the water resources, and discuss non-point-source pollution issues with volunteers.
- Implement an "Adopt A Stream" program where volunteers clean up, monitor, protect, and restore a stretch of stream. The adopting group or organization becomes the primary caretaker of that stretch of stream.

Limitations:

- Organization at the municipal level is a limitation to cleanup efforts. Some municipalities do not have the resources to designate staff to oversee a cleanup program and to supervise cleanup activities.
- Limitations to an effective cleanup program are volunteer interest and commitment.

Maintenance:

- To maintain water quality, cleanup efforts must be recurring; a one-time-only cleanup event might raise awareness in the community, but it will not keep trash out of the river.
- Seasonal or annual cleanup events will help make sure that trash and debris are kept out of the river as much as possible.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☒ Sediment
- ☒ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☒ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

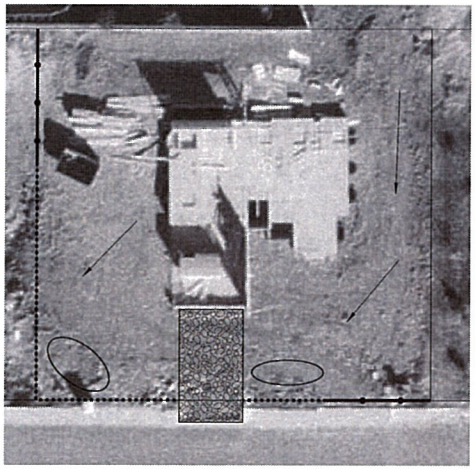
Implementation Requirements

- ☐ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Sediment Control on Small Construction Sites

SCSCS



Applications

- ☐ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment
- ☒ Housekeeping Practices

Description:
Control the perimeter, vehicular access, the delivery of materials to small construction sites so that sediment, landscaping materials and other construction debris is not in the street. This BMP is intended to be applied to residential construction sites and small nonresidential sites

Approach:
- Prior to any building construction on a site, identify the point of access to the property. This should generally be the location of the future driveway. Fence the remainder of the street frontage of the property, as well as side lot lines (as far as necessary to prevent access) with temporary fencing (silt fence may be used where silt fence is needed). This fencing is to remain in place until all construction or landscape material deliveries are complete. **No access is to be made at any point other than the designated point of access.**
- Control the perimeter of the site so that sediment-laden storm water does not leave the site during construction. This may involve sediment control measures such as silt fences, drainage swales or berms, straw or hay bale barriers, or rock check dams.
- Either utilize the curb cut or cut the curb and remove the sidewalk at the access point. **Do not place anything in the gutter, including dirt ramps.**
- Excavate for and place a bed of gravel or drain rock the full width of the future driveway (16' minimum), a distance of 32 feet back from the back of sidewalk. Place the rock to the depth necessary to prevent material delivery vehicles from contacting the on-site soils.
- At the proper time, the gravel or rock bed can be modified to serve as the base for concrete driveway placement. At that point, the concrete driveway will prevent delivery and other vehicles from coming into contact with on-site soils.

Limitations:
- It may be necessary to pump concrete to locations away from the bed of gravel or rock.
- Parking of workers' vehicles may require that the bed of gravel or rock be enlarged to make space for vehicle parking that keeps the vehicles from contacting the on-site soils.
- Builders, subcontractors, material suppliers, vendors and other visitors to the site must be educated to adhere to the practices outlined.
- Landscaping and construction materials must be placed on the lot, not the street or walk.

Maintenance:
- Repair fencing as needed to maintain control of access.
- Repair sediment control measures as needed during construction.
- Replenish and dress up this gravel/rock area as needed during the course of construction.
- Any tracking of soil onto the adjacent street indicates inadequate performance of this BMP. Clean soil tracked onto the street at the end of any day that it occurs and take corrective measures to prevent soil tracking onto the street from recurring.
- Replenish and dress up this gravel/rock area as needed during the course of construction.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☒ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

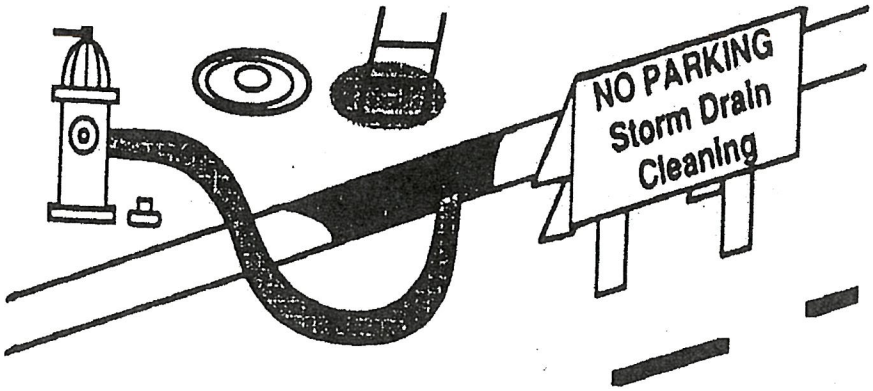
Implementation Requirements

- ☒ Capital Costs
- ☐ O&M Costs
- ■ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

BMP: Storm Drain Flushing

SDF



DESCRIPTION:

A storm drain is Aflushed@ with water to suspend and remove deposited materials. Flushing is particularly beneficial for storm drain pipes with grades too flat to be self-cleansing. Flushing helps ensure pipes convey design flow and remove pollutants from the storm drain system.

APPROACH:

< Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
< Whenever possible, flushed effluent should be collected, decanted, evaporated, and disposed of in a landfill.

LIMITATIONS:

< Most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity).
< Water source must be available.
< May have difficulty finding downstream area to collect sediments.
< Requires liquid/sediment disposal.

PROGRAM ELEMENTS

9 New Development
9 Residential
9 Commercial Activities
9 Industrial Activities
: Municipal Facilities
9 Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
: Nutrients
: Heavy Metals
9 Toxic Materials
: Oxygen Demanding Substances
9 Oil & Grease
9 Floatable Materials
Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

: Capital Costs
O&M Costs
9 Regulatory
: Training
Staffing
9 Administrative

■ High ☒ Medium ☐ Low

BMP: Storm Drain System Signs

SDSS

DESCRIPTION:

Stenciling of the storm drain system (inlets, catch basins, channels, and creeks) with prohibitive language/graphic icons discourages the illegal dumping of unwanted materials.

APPROACH:

< Create a volunteer work force to stencil storm drain inlets.
< An important aspect of a stenciling program is the distribution of informational flyers that educate the neighborhood (business and residential) about stormwater pollution, the storm drain system, and the watershed. The flyers should also provide information on alternatives such as recycling, household hazardous waste disposal, and safer products.
< Because a stenciling program primarily involves volunteer services, liability release forms and volunteer identification notices should also be administered.
< Readability of stencils is critical to their effectiveness. Wherever possible stencils should be painted on a smooth surface such as cement, as opposed to asphalt.
< Use municipal staff to erect signs near drainage channels and creeks.
< An effectively implemented stenciling program encourages change in personal behavior and helps minimize non-point source pollutants from entering the storm drain system. An additional benefit is that waste and catch basin maintenance is minimized through the reduction of disposed materials into storm drain inlets. Finally a well-implemented stenciling program encourages the use of household hazardous waste collection and used oil recycling programs.

LIMITATIONS:

< Private property access limits stenciling to publicly-owned areas.
< Program is highly dependent on volunteer response.
< Storm drain inlets that are physically blocked will be missed or require follow-up.
< High traffic/commercial/industrial zones are the responsibility of city staff.
< Ongoing maintenance is needed to maintain readable signs.

PROGRAM ELEMENTS

: New Development
: Residential
: Commercial Activities
: Industrial Activities
: Municipal Facilities
: Illegal Discharges

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

Sediment
Nutrients
9 Heavy Metals
Toxic Materials
Oxygen Demanding Substances
Oil & Grease
Floatable Materials
9 Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

9 Capital Costs
: O&M Costs
9 Regulatory
: Training
9 Staffing
9 Administrative

■ High ☒ Medium ☐ Low

BMP: Service Group Participation

SGP

DESCRIPTION:

Citizens of the local community can volunteer to carry out various service projects. These projects allow citizens to become directly involved in improving the community.

APPROACH:

- Designate an individual or groups of individuals to schedule and organize the service projects, recruit volunteers, coordinate any trash disposal with the local solid waste authority, and assign staff for supervision of the projects.
- The first step for a municipally sponsored service program is to identify needed service projects.
- Advertise the program and let citizens know about service project opportunities. Projects can be advertised on bulletin boards, in a newsletter, on a website, etc.
- When volunteers are being used for service projects, municipalities must address the issue of liability. An attorney should be consulted to determine how liability should be handled and draft a waiver for volunteers to sign before participating.
- Service events are also effective at increasing public awareness of the need to better the community.

LIMITATIONS:

- Organization at the municipal level is a limitation to service project efforts. Some municipalities do not have the resources to designate staff to oversee and support a service project program and to supervise the projects.
- Limitations to an effective service group program are volunteer interest and commitment.
- Some desired service projects require funding that may not be available.

MAINTENANCE:

- Service project lists need to be updated continually.

APPLICATIONS

- ☐ Manufacturing
- ■ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☒ Commercial Activities
- ☒ Roadways
- ■ Waste Containment
- ☒ Housekeeping Practices

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ☒ Sediment
- ☒ Nutrients
- ☒ Heavy Metals
- ☒ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☒ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Signs and Labels

SL

Applications

- ☒ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☐ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment
- ☒ Housekeeping Practices

Description:

Signs and labels identify problem areas or hazardous materials at a facility. Warning signs, often found at industrial facilities, are a good way to suggest caution in certain areas. Signs and labels can also provide instructions on the use of materials and equipment. Labeling is a good way to organize large amounts of materials, pipes, and equipment, particularly on large sites.

Approach:

Signs and labels can be used at all types of facilities. Areas where they are particularly useful are material transfer areas, equipment areas, loading and unloading areas, or anywhere information might prevent contaminants from being released to stormwater.

Signs and labels should be visible and easy to read. Useful signs and labels might provide the following information:

- Names of facility and regulatory personnel, including emergency phone numbers, to contact in case of an accidental discharge, spill, or other emergency.
- Proper uses of equipment that could cause release of stormwater contaminants.
- Types of chemicals used in high-risk areas.
- The direction of drainage lines/ditches and their destination (treatment or discharge).
- Information on a specific material.
- Refer to OSHA standards for sizes and numbers of signs required for hazardous material labeling.

Limitations:

No limitations.

Maintenance:

- Periodic checks can ensure that signs are still in place and labels are properly attached.
- Signs and labels should be replaced and repaired as often as necessary.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

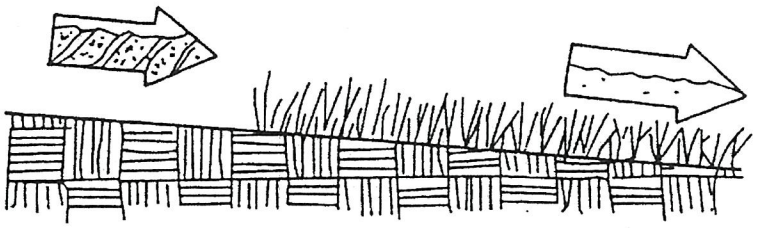
- ☐ Sediment
- ☐ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☐ Floatable Materials

Implementation Requirements

- ☐ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☒ Training

BMP: Seeding and Planting

SP



Objectives

- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas
- ☒ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Description:

Seeding of grass and plantings of trees, shrubs, vines and ground covers provide long-term stabilization of soil. In some areas, with suitable climates, grasses can be planted for temporary stabilization.

Application:

- Appropriate for site stabilization both during construction and post-construction.
- Any graded/cleared areas where construction activities have ceased.
- Open space cut and fill areas.
- Steep slopes, spoil piles, vegetated swales, landscape corridors, stream banks.

Installation/Application Criteria:

Type of vegetation, site and seedbed preparation, planting time, fertilization and water requirements should be considered for each application.

Grasses:

- Ground preparation: fertilize and mechanically stabilize the soil.
- Tolerant of short-term temperature extremes and waterlogged soil composition.
- Appropriate soil conditions: shallow soil base, good drainage, slope 2:1 or flatter.
- Mowing, irrigating, and fertilizing are vital for promoting vigorous grass growth.

Trees and Shrubs:

- Selection criteria: vigor, species, size, shape & wildlife food source.
- Soil conditions: select species appropriate for soil, drainage & acidity.
- Other factors: wind/exposure, temperature extremes, and irrigation needs.

Vines and Ground Covers:

- Ground preparation: lime and fertilizer preparation.
- Use proper seeding rates.
- Appropriate soil conditions: drainage, acidity and slopes.
- Generally avoid species requiring irrigation.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ☒ Nutrients
- ☒ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

BMP: Site Plan Review

SPR

Applications

- ☒ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ■ Construction
- ☒ Commercial Activities
- ☒ Roadways
- ☐ Waste Containment
- ☒ Housekeeping Practices

Description:

All developers are required to submit a site plan for their developments. Site plans are reviewed to ensure that general site guidelines are being followed.

Approach:

- Develop site plan preparation guidelines for developers to follow.
- Require a site plan that follows the guidelines for each new development.
- Educate local developers on how to follow the guidelines for their new developments.
- Educate municipal staff to check that the guidelines are being followed in the site plans that they review.
- Encourage staged construction activities to minimize the amount of exposed areas at any given time.
- Encourage the protection of existing vegetation whenever possible.

Limitations:

- More time and effort will be required of the municipal staff to review new development plans.

Maintenance:

- Programs and educational materials can be repeatedly sent out or emphasized. Extension service continues to research and provide current data.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ■ Nutrients
- ☒ Heavy Metals
- ☒ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☐ Floatable Materials
- ☒ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☐ Maintenance
- ☒ Training

■ High ☒ Medium ☐ Low

BMP: Septic Systems Controls

SSC

Many times an aged or failing septic system requires tank replacement (Source: Texas A&M University, 1995)

Applications

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

Description:

Prevent new septic systems from failing, detect and correct existing systems that have been failing by educating homeowners installers and inspectors about proper operation and maintenance of septic systems.

Approach:

- Educational outreach and training help to avoid system failures for owners of both new and existing systems.
- Septic systems should be located to ensure a horizontal distance from surface waters and vertical separation from ground water.
- The proper sizing of a system is necessary to avoid hydraulic overloading.
- In some cases, modifications to septic systems may be necessary in order to ensure proper treatment of wastewater discharges. Household chemicals can kill the bacteria that make the system work and non-degradable materials (cigarette butts, etc.) can clog the system.
- A septic system management program of scheduled pumpouts and regular maintenance is the best way to reduce the possibility of failure for currently operating systems.
- Proper siting and post-construction inspection will work to prevent new systems from failing.

Limitations:

- Reliance on individual on-site inspection to detect failed systems is another major limitation. The individual on-site inspection is very labor-intensive and requires access to private property to pinpoint the exact location of the failing system.
- Perhaps the biggest limitation to correcting failing septic systems is the lack of techniques for detecting individual failed systems.
- Once a septic system has been identified as failing, procedures must be in place to replace that system. The cost to replace a septic system typically ranges between $3,000 and $7,000 per unit (NSFC, 1999),

Maintenance:

- Periodic maintenance of on-site systems is necessary to ensure their proper functioning. Since many homeowners do not employ these routine maintenance practices, it may be necessary for agencies to establish programs to track pumpouts and maintenance requirements.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☐ Sediment
- ■ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ■ Bacteria & Viruses

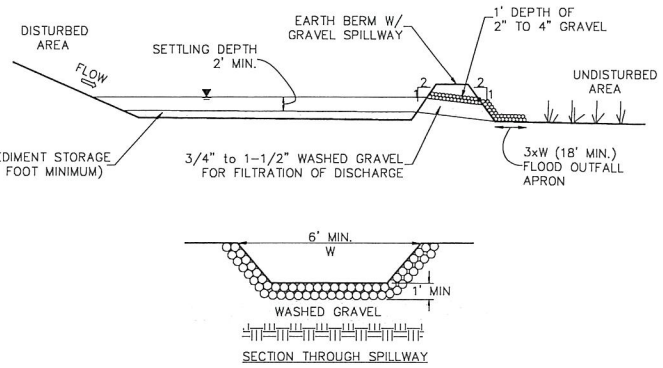
- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☒ Training

BMP: Sediment Trap

ST



OBJECTIVES

- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☒ Control Internal Erosion

DESCRIPTION:

A sediment trap is a small excavated or bermed area where runoff from small drainage areas is detained and sediment can settle.

APPLICATION:

- Temporary control for runoff from disturbed areas of less than 3 acres.
- Temporary control for discharge from diversion dike, surface benching, or other temporary drainage measures.

INSTALLATION/APPLICATION CRITERIA:

- Design basin for site specific location.
- Excavate basin or construct compacted berm containment.
- Construct outfall spillway with apron.
- Provide downstream silt fence if necessary.

LIMITATIONS:

- Should be sized based on anticipated runoff, sediment loading and drainage area size.
- May require silt fence at outlet for entrapment of very fine silts and clays.

MAINTENANCE:

- Inspect after each rainfall event and at a minimum of monthly.
- Repair any damage to berm, spillway or sidewalls.
- Remove accumulated sediment as it reaches 2/3 height of available storage.
- Check outlet for sedimentation/erosion of downgradient area and remediate as necessary. Install silt fence if sedimentation apparent.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ■ Sediment
- ☐ Nutrients
- ☒ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☒ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Storm Water Advisory Committee

SWA

Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☒ Roadways
- ☒ Waste Containment

Description:

The committee can consist of local governments, citizens, nonprofit environmental groups, local business owners, school district representatives, local church representatives, and youth group leaders, among others. The purpose of a storm water advisory committee is to address water quality concerns within the community and to help develop and maintain a storm water management program. The committee will meet at least annually to assess the program, review its progress, analyze the budget, administer improvements to the plan, and submit a report to Department of Environmental Quality.

Approach:

- Establishment of committee members who have a vested interest in solving storm water management problems within the community.
- Development of a storm water management program that will reduce the discharge of pollutants, protect water quality, satisfy the requirements of the Clean Water Act, and be phased over a five year period.
- Incorporation of Best Management Practices as a part of the storm water management program in order to assist in accomplishment of measurable goals in six control measures.
- Establishment of measurable goals to satisfy each of the six control measures. Goals to be set with completion dates and associated costs involved.
- Submission of a Notice of Intent to the Department of Environmental Quality to be used as a permit application.
- Submission of required reports to the Department of Environmental Quality. Report to include:
  1. The status of compliance with permit conditions, including an assessment of the appropriateness of the selected BMPs and progress toward achieving the selected measurable goals for each minimum measure;
  2. Results of any information collected and analyzed, including monitoring data if any;
  3. A summary of the storm water activities planned for the next reporting cycle;
  4. A change in any identified BMP or measurable goals for any minimum measure; and
  5. Notice of relying on another governmental entity to satisfy some of the permit obligations (if applicable).
- Records required by the Department of Environmental Quality must be kept for at least 3 years and made accessible to the public at reasonable times during regular business hours. Records need not be submitted to the Department of Environmental Quality unless the permitee is requested to do so.

Limitations:

- Limitations include finding an appropriate location and time to meet, and keeping the committee organized and focused enough to get items accomplished.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☒ Sediment
- ☒ Nutrients
- ☒ Heavy Metals
- ☒ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☒ Floatable Materials
- ☒ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☐ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☒ Training

BMP: Storm Water Educational Materials

SWEM

Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☒ Roadways
- ☒ Waste Containment

Description:

Educational Materials to present information to the public on storm water issues and water quality awareness is an integral part of any storm water education program. Providing storm water education by sending out information with bills, newsletters, or presented at city activities, in city offices, schools, and fair booths, exposes the message to a wide variety of people, if not city-wide. Topics can include Water conservation, proper lawn and garden care, and proper disposal of hazardous household wastes. Many educational materials can be used for city personnel, contractors as well as homeowners or businesses.

Approach:

- Building a strong relationship with citizens is the most important step in getting storm water education city-wide.
- Educational materials can be tailored to all different age groups and technical background.
- Should make people aware of the potential impacts of hazardous household materials on water quality and inform residents of ways to properly store, handle, and dispose of the chemicals
- Water usage in the home can easily be reduced by 15 to 20 percent—without major discomfort—by implementing a program to conserve water in the home.
- Lawn and garden activities can result in contamination of storm water through pesticide, soil, and fertilizer runoff. Proper landscape management, however, can effectively reduce water use and contaminant runoff and enhance the aesthetics of a property.

Limitations:

- Not everyone will actually read or incorporate the information into their lives.
- Budgets need to have sufficient funds to obtain educational materials and their distribution.

Maintenance:

- Programs and educational materials can be re-used, but they must be presented on a continual basis.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ■ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ■ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Storm Water Funding

SWF

Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☒ Roadways
- ☒ Waste Containment

Description:

In order to meet the requirements for improving storm water quality, a funding source will need to be established. Funding may come from existing revenue collected by the municipality or by setting up a storm water utility. Funding may also come from taxes, loans, grants, donations, fines or other legal sources.

Approach:

In order to establish a storm water utility the municipality can:

- Determine how fees should be assessed; water service connection size, impervious area calculations, equivalent residential units, property value assessments, flat fee, etc. Make calculations and evaluations necessary to justify anticipated rates.
- Develop a rate schedule. This may vary with unique situations such as, airports, schools, churches, hospitals, and large commercial developments. The municipality has the option to apply a rate discount for properties that have on-site detention or that contribute to the improvement of storm water quality in other ways. For simplicity in establishing a rate schedule for residential properties, a flat fee may be assessed based upon the size of the property.
- Notification of the storm water utility must be made with an explanation of the required fees to every property owner in the municipality.
- Implementation of the storm water utility.
- Enforcement should be established with penalties for non-payment.
- Enterprise fund should be set up and managed in a legal and professional manor.
- A public hearing will need to be held to explain the new fees and their purpose.

Limitations:

- Establishment of a rate schedule that will be fair and reasonable.
- Collection of fees without public resistance.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☒ Sediment
- ☒ Nutrients
- ☒ Heavy Metals
- ☒ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☒ Floatable Materials
- ☒ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ■ Capital Costs
- ☒ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Urban Forestry

UF

Trees can be incorporated into urban landscapes for water quality benefits in addition to aesthetic and shade benefits

Applications

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment

Description:

Urban forestry is the study of trees and forests in and around towns and cities. Since trees absorb water, patches of forest and the trees that line streets can help provide some of the storm water management required in an urban setting. Urban forests also help break up a landscape of impervious cover, provide small but essential green spaces, and link walkways and trails.

Approach:

- An urban forestry plan should include measures to establish, conserve, and/or reestablish preservation areas.
- A forest preservation ordinance is one way to set design standards outlining how a forest should be preserved and managed. The ordinance should outline some basic management techniques and should contain some essential elements.
  - A map and narrative description of the forest and the surrounding area that includes topography, soils, streams, current forested and unforested areas, tree lines, critical habitats, and 100-year flood plain.
  - An assessment that establishes preservation, reforestation, and afforestation areas.
  - A forest conservation map that outlines forest retention areas, reforestation, afforestation, protective devices, limits of disturbance, and stockpile areas.
  - A schedule of any additional construction in and around the forest area.
  - A specific management plan, including tree and forest protection measures.
  - A reforestation and afforestation plan.
- An ordinance can also be developed that addresses tree preservation at the site level both during construction and after construction is complete.

Limitations:

- One of the biggest limitations to urban forestry is development pressure.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☒ Sediment
- ☒ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Using the Media

UM

Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☒ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

Description:

The media can be strong allies to a storm water pollution prevention campaign in educating the public about storm water issues. Through the media, a program can educate targeted or mass audiences about problems and solutions, build support for remediation and retrofit projects, or generate awareness and interest in storm water management. Best of all, packaging a storm water message as a news story is virtually free!

Approach:

- *Newspapers and Magazines*. Newspapers are powerful vehicles for delivering educational information, policy analyses, public notices, and other messages. Many displays at watershed seminars proudly post newspaper articles on the projects being presented in recognition of the importance and impact of newspaper coverage.
- Newspapers can be accessed in several ways. Depending on the message or event, the appropriate format might be a news release, news advisory, query letter, letter to the editor, or (for urgent, timely information) a news conference
- *Magazines*. Magazines, like newspapers, allow for greater length and analysis than television and provide the additional benefit of targeting specific audiences (e.g., landscapers, automobile mechanics, farmers, or recreationists).
- *Radio*. In spite of the popularity of video, radio remains a strong media contender due to its affordable production costs and creative possibilities. Further, commuters who drive to work spend much time in their vehicles.
- *Television*. Television is the primary source of news for the majority of the population, and local reporters are generally interested in covering environmental stories that pertain to their area.
- Issues will attract television coverage if they Involve local people or issues, Focus on unique or unusual attributes, Affect many people throughout a region, Involve controversy or strong emotions

- *Internet Message*. Increasingly, the Internet is becoming a powerful means of communication. It provides worldwide access to hundreds of thousands of sites containing millions of documents, chat rooms for special interest groups, and incredible database/mapping features.

Limitations:

- Working with the media is essentially free, but not always.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ■ Sediment
- ■ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ■ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☐ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Used Oil Recycling

UOR

Description:

Used motor oil is a hazardous waste because it contains heavy metals picked up from the engine during use. Since it is toxic to humans, wildlife, and plants, it should be disposed of at a local recycling or disposal facility.

Approach:

- When establishing oil recycling programs, municipalities should provide the public with the proper informational resources.
- The public can also call 1-800-RECYCLE or contact Earth's 911 at www.1800cleanup.org/ for more information.
- Municipalities also need to address oil filter recycling in their recycling programs.
- To make recycling motor oil more convenient for the do-it-yourselfers, oil recycling programs should be located throughout all communities.
- Two types of programs currently in use are drop-off locations and curbside collection. Drop-off locations include service stations, recycling centers, auto parts retail stores, quick lubes, and landfills.

Limitations:

- If oil is mixed with other substances or if storage containers have residues of other substances, this can contaminate oil and make it a hazardous waste.
- It is often difficult to effectively educate the public and convince them of the importance of recycling oil. This limitation can be addressed if municipalities include recycling information in utility bill inserts, newspaper ads, and mailings.

Maintenance:

- Costs for used motor oil recycling programs vary depending on whether a community has already established similar types of recycling programs.
- Major costs associated with oil recycling programs include advertisement costs and oil collection costs.

Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☐ Sediment
- ☐ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ■ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

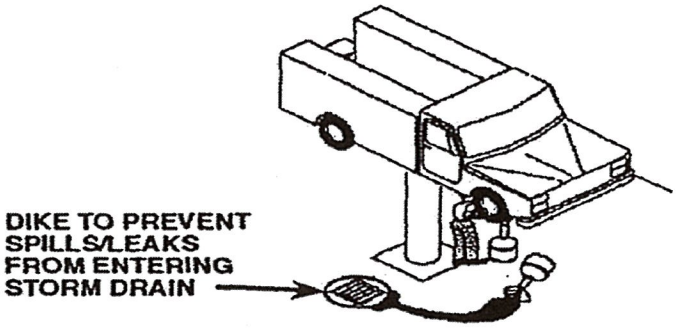
Implementation Requirements

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Vehicle And Equipment Maintenance & Repair

VEMR



(INSIDE MAINTENANCE FACILITY)

APPLICATIONS

- ☐ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways

DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from vehicles and equipment maintenance and repair by running a dry shop.

APPROACH:

- Keep equipment clean, don't allow excessive build-up of oil and grease.
- Keep drip pans or containers under the areas that might drip.
- Do not change motor oil or perform equipment maintenance in non-appropriate areas.
- Inspect equipment for leaks on a regular basis.
- Segregate wastes.
- Make sure oil filters are completely drained and crushed before recycling or disposal.
- Make sure incoming vehicles are checked for leaking oil and fluids.
- Clean yard storm drain inlets regularly and especially after large storms.
- Do not pour materials down drains or hose down work areas; use dry seeping.
- Store idle equipment under cover.
- Drain all fluids from wrecked vehicles.
- Recycle greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmission fluids.
- Switch to non-toxic chemicals for maintenance when possible.
- Clean small spills with rags, general clean-up with damp mops and larger spills with absorbent material.
- Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- Train employees, minimize use of solvents.

LIMITATIONS:

- Space and time limitations may preclude all work being conducted indoors.
- It may not be possible to contain and clean up spills from vehicles/equipment brought on-site after working hours.
- Dry pans are generally too small to contain antifreeze, which may gush from some vehicles, so drip pans may have to be purchased or fabricated.
- Dry floor cleaning methods may not be sufficient for some spills.

MAINTENANCE:

Should be low if procedures for the approach are followed.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ☐ Sediment
- ☐ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ■ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ☐ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☒ Training

BMP: Vehicle Wash Area

VWA

OBJECTIVES

- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☒ Control Site Perimeter
- ☐ Control Internal Erosion

DESCRIPTION:

A series of vegetated, open channel management practices designed specifically to treat and attenuate storm water runoff for a specified water quality volume. Storm water is treated through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils.

APPROACH:

- Grassed swales can be applied in most situations with some restrictions. Swales are very well suited for treating highway or residential road runoff because they are linear practices.
- Grassed channels are a good treatment option within watersheds that drain to cold water streams. These practices do not pond water for a long period of time and often induce infiltration. As a result, standing water will not typically be subjected to warming by the sun in these practices.
- Grassed swales should be used on sites with relatively flat slopes of less than 4 percent slope; 1 to 2 percent slope is recommended.
- A small fore-bay should be used at the front of the swale to trap incoming sediments. A pea gravel diaphragm, a small trench filled with river run gravel, should be used as pretreatment for runoff entering the sides of the swale.
- Swales should also have the capacity to pass larger storms (typically a 10-year storm) safely.

LIMITATIONS:

- Grassed swales cannot treat a very large drainage area.
- Wet swales may become a nuisance due to mosquito breeding.

MAINTENANCE:

- Maintenance of grassed swales mostly involves maintenance of the grass or wetland plant cover.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ■ Sediment
- ■ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ■ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☒ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Water Conservation Practices for Homeowners

WCPH

Applications

- ☐ Manufacturing
- ☐ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment

Description:

Water conservation information can be distributed to water users to make them aware of wasteful behaviors, detecting leaks, and conserving water. Proper lawn and garden care, and general water use practices can reduce the potential of chemicals, wastes and other pollutants from entering waterways.

Approach:

- Water usage in the home can easily be reduced by 15 to 20 percent—without major discomfort—by implementing a program to conserve water in the home. This can be economically better for residents by lowering water bills.
- Lawn and garden activities can result in contamination of storm water through pesticide, soil, and fertilizer runoff. Proper landscape management, however, can effectively reduce water use and contaminant runoff as well as enhance the aesthetics of a property.
- Car washing and washing down garages and driveways can contaminate and be wasteful in water use.
- People may change their habits if they are aware of alternative methods.
- Mulches and compost are ways to recycle yard waste as well as provide material to maintain moisture for plants. This ground cover minimizes weeds, prevents erosion, and promotes less water usage.
- Outdoor watering restrictions can be established to encourage proper watering techniques.

Limitations:

- With so many issues, environmental issues might be viewed as less important.
- Policing and monitoring can be difficult.

Maintenance:

- Programs and educational materials can be repeatedly sent out or emphasized. Extension service continues to research and provide current data.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☐ Sediment
- ■ Nutrients
- ☒ Heavy Metals
- ☒ Toxic Materials
- ☒ Oxygen Demanding Substances
- ■ Oil & Grease
- ☐ Floatable Materials
- ■ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

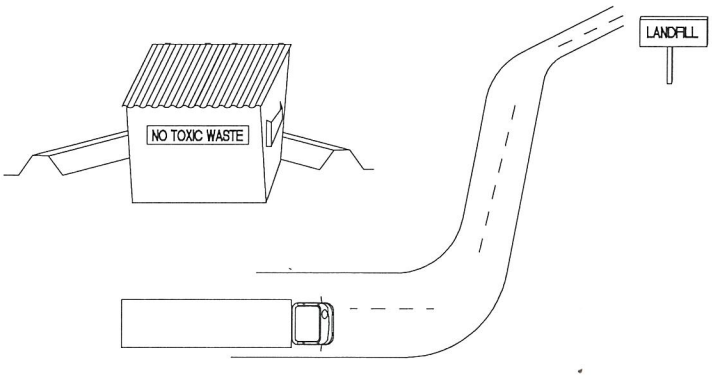
Implementation Requirements

- ☐ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Waste Disposal

WD



OBJECTIVES

- ☒ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

DESCRIPTION:

Controlled storage and disposal of solid waste generated by construction activities.

APPLICATION:

All construction sites.

INSTALLATION:

- Designate one or several waste collection areas with easy access for construction vehicles and personnel. Ensure no waterways or storm drainage inlets are located near the waste collection areas.
- Construct compacted earthen berm (See Earth Berm Barrier Information Sheet), or similar perimeter containment around collection area for impoundment in the case of spills and to trap any windblown trash.
- Use water tight containers with covers to remain closed when not in use. Provide separate containers for different waste types where appropriate and label clearly.
- Ensure all on site personnel are aware of and utilize designated waste collection area properly and for intended use only (e.g. all toxic, hazardous, or recyclable materials shall be properly disposed of separately from general construction waste).
- Arrange for periodic pickup, transfer and disposal of collected waste at an authorized disposal location. Include regular Porto-potty service in waste management activities.

LIMITATIONS:

- On-site personnel are responsible for correct disposal of waste.

MAINTENANCE:

- Discuss waste management procedures at progress meetings.
- Collect site trash daily and deposit in covered containers at designated collection areas.
- Check containers for leakage or inadequate covers and replace as needed.
- Randomly check disposed materials for any unauthorized waste (e.g. toxic materials).
- During daily site inspections check that waste is not being incorrectly disposed of on-site (e.g. burial, burning, surface discharge, discharge to storm drain).

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ☐ Sediment
- ☐ Nutrients
- ■ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ■ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

- ■ Capital Costs
- ■ O&M Costs
- ☒ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

BMP: Waste Handling And Disposal

WHD

APPLICATIONS

- ☐ Manufacturing
- ☒ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from waste handling and disposal by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing runon and runoff from waste management areas.

APPROACH:

- Maintain usage inventory to limit waste generation.
- Substitute or eliminate raw materials.
- Modify process or equipment.
- SARA Title III, Section 313 requires reporting for over 300 listed chemicals and chemical compounds. This requirement should be used to track these chemicals although this is not as accurate a means of tracking as other approaches.
- Track waste generated.
- Use design data and review: process flow diagram, materials and applications diagram, piping and instructions, equipment list, plot plan.
- Use economic data and review: Waste treatment and disposal cost. Product utility and economic cost. Operation and maintenance labor cost.
- Recycle materials whenever possible.
- Maintain list of and the amounts of materials disposed.
- Segregation and separate waste.
- Cover, enclose, or berm industrial wastewater management areas whenever possible to prevent contact with runon or runoff.
- Equip waste transport vehicles with anti-spill equipment.
- Minimize spills and fugitive losses such as dust or mist from loading systems.
- Ensure that sediments or wastes are prevented from being tracked off-site.
- Training and supervision.
- Stencil storm drains on the facility's property with prohibitive message regarding waste disposal.

LIMITATIONS:

Hazardous waste that cannot be re-used or recycled must be disposed of by a licensed hazardous waste hauler.

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ☐ Sediment
- ☐ Nutrients
- ■ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ■ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- ☐ Capital Costs
- ☒ O&M Costs
- ☐ Maintenance
- ☒ Training

BMP: Watershed Organization

WO

Applications

- ☒ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☒ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

Description:

The group can consist of local governments, citizens, nonprofit environmental groups, and local universities, among others. The purpose of a watershed organization is to restore, protect, and promote the natural resources of the watershed. Watershed organization meetings can be in the form of a local storm water management panel, a public meeting, or any type of interactive, information-sharing event.

Approach:

- A stakeholder should have a vested interest in solving storm water management problems for the particular water body. Representatives from several local newspapers, radio stations, and television news departments should be included.
- Local businesses that might be affected by storm water fees associated with impervious area would also be good members.
- The municipality must decide how to approach stakeholders. Flyers and media stories can be used to educate stakeholders and to prepare them for a public meeting.
- Rules for conducting the meeting must be agreed upon and can be addressed with the following questions: Will the meeting be facilitated? Will decisions be made by consensus? What approach will the group take?
- A question and answer period and a time for comments should be planned. It is often difficult to get people to speak in public, but it is a good way for them to express their opinions and concerns.
- Watershed organizations typically sponsor such projects as: Field trips and tours, Meetings and workshops, Canoe trips, Volunteer monitoring, Cleanup and restoration days, Educational programs for schools, civic groups, and other local organizations, Media relations, Opinion surveys, Focus groups (CTIC, no date).

Limitations:

- It takes time and skill to establish partnerships and create an effective watershed organization.
- Limitations include finding an appropriate location and time to meet, costs associated with planning and holding meetings, and keeping the stakeholders organized and focused enough to get items accomplished.

Maintenance:

- Meetings must be continued, and involvement encouraged and subjects focused.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

- ☒ Sediment
- ☒ Nutrients
- ☒ Heavy Metals
- ☒ Toxic Materials
- ☒ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☒ Floatable Materials
- ☒ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements

- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☒ Training

■ High ☒ Medium ☐ Low

BMP: Wet Ponds

WP

Considerations

: Soils

: Area Required

: Slope

: Water Availability

: Aesthetics

9 Hydraulic Head

: Environmental Side Effects

Description:

A wet pond has a permanent water pool to treat incoming stormwater. An enhanced wet pond includes a pretreatment sediment forebay.

Application:

< Need to achieve high level of particulate and some dissolved contaminant removal.
< Ideal for large, regional tributary areas.
< Multiple benefits of passive recreation (e.g. bird watching, wildlife habitat).

Installation/Application Criteria:

< Water depth of 3 to 9 feet.
< Wetland vegetation, occupying 25-50% of water surface area.
< Design to minimize short-circuiting.
< Bypass storms greater than two year storm.
< Establishing wetland vegetation may be difficult.

Limitations:

< Concern for mosquitoes and maintaining oxygen in ponds.
< Cannot be placed on steep unstable slopes.
< Need base flow or supplemental water if water level is to be maintained.
< Infeasible in very dense urban areas.
< May require permits from various regulatory agencies, e.g.,Corps of Engineers.

Maintenance:

< Remove floatables and sediment build-up.
< Correct erosion spots in banks.
< Control mosquitoes.

SOUTH SALT LAKE PUBLIC WORKS

Targeted Pollutants

Sediment
: Nutrients
: Heavy Metals
: Toxic Materials
: Oxygen Demanding Substances
: Oil & Grease
Floatable Materials
: Bacteria & Viruses

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

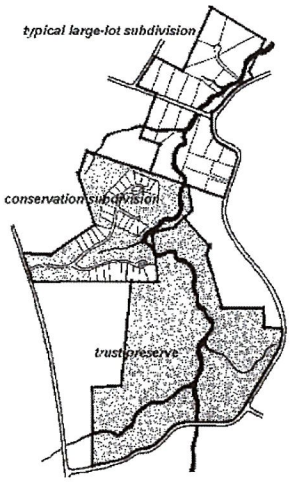
Implementation Requirements

Capital Costs
: O&M Costs
: Maintenance
9 Training

■ High ☒ Medium ☐ Low

BMP: Zoning

ZO



DESCRIPTION:

Zoning is a classification scheme for land use planning. Zoning can serve numerous functions and can help mitigate storm water runoff problems by facilitating better site designs. By correctly applying the right zoning technique, development can be targeted into specific areas, limiting development in other areas and providing protection for the most important land conservation areas.

APPROACH:

- Impervious Overlay Zoning: This type of overlay zoning limits future impervious areas.
- Incentive Zoning: This planning technique relies on bonuses or incentives for developers to encourage the creation of certain amenities or land use designs. A developer is granted the right to build more intensively on a property or given some other bonus in exchange for an amenity or a design that the community considers beneficial.
- Performance Zoning: Performance zoning is a flexible approach that has been employed in a variety of fashions in several different communities across the country. Some performance factors include traffic or noise generation limits, lighting requirements, storm water runoff quality and quantity criteria, protection of wildlife and vegetation, and even architectural style criteria
- Urban Growth Boundaries: Urban growth boundaries are sometimes called development service districts and include areas where public services are already provided (e.g., sewer, water, roads, police, fire, and schools).

LIMITATIONS:

- Some zoning techniques may be limited by economic and political acceptance and should be evaluated on these criteria as well as storm water management goals.

APPLICATIONS

- ☐ Manufacturing
- ☐ Material Handling
- ☐ Vehicle Maintenance
- ☒ Construction
- ☒ Commercial Activities
- ☐ Roadways
- ☐ Waste Containment
- ☐ Housekeeping Practices

SOUTH SALT LAKE PUBLIC WORKS

TARGETED POLLUTANTS

- ☒ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

STANDARD OPERATING PROCEDURES

City of South Salt Lake
Public Works

SOUTH SALT LAKE
PUBLIC WORKS

Created: March 2011
City of South Salt Lake
Standard Operating Procedures Rev. August 2018

TABLE OF CONTENTS

BUILDINGS – Dumpsters/Garbage Storage

Preparation

a. Train employees on proper trash disposal.

b. Locate dumpsters and trash cans in convenient, easily accessible areas.

c. Provide properly-labeled recycling bins to reduce the amount of garbage disposed.

d. Install berms, curbing, or vegetation strips around storage areas to control water entering/ leaving storage areas.

e. Whenever possible store garbage containers beneath a covered structure or inside to prevent contact with storm water.

Process

a. Inspect garbage bins for leaks regularly, and have repairs made immediately by responsible party.

b. Request/use dumpsters, and trash cans with lids and without drain holes.

c. Locate dumpsters on a flat, hard surface that does not slope or drain directly into the storm drain system.

d. Have garbage bins emptied regularly to keep from overfilling.

Clean-up

a. Keep areas around dumpsters clean of all garbage.

b. Wash out bins or dumpsters as needed to keep odors from becoming a problem. Wash only to occur at the Public Works facility in the garage where the wash water enters the sanitary sewer.

Documentation

a. Document training of employees

BUILDINGS – Parking Lot Maintenance

Preparation

a. Conduct regular employee training to reinforce proper housekeeping.

b. Restrict parking in areas to be swept prior to and during sweeping using barriers as necessary.

c. Perform regular maintenance and services in accordance with the recommended vehicle maintenance schedule on sweepers to help ensure availability and maintain vehicle efficiency.

Process

a. Sweep parking areas in accordance with the schedule or as directed by the City's responsible official.

b. Hand sweep sections of gutter and inlets if soil and debris accumulate.

c. Pick-up litter as required to keep parking areas clean and orderly.

Clean-up

a. Dispose of sweepings properly and clean sweepers in accordance with the Sweeper Debris Dumping and Wash out Station SOP.

Documentation

a. Keep accurate logs to track swept parking areas and approximate quantities.

b. Document training of employees.

IDDE – Business Education

Preparation

a. Locate and determine organizations that have high potential to be involved with water quality issues or who have past history of illicit discharge.

b. Schedule 20 to 30 minutes to meet with the business, and prepare a short outline to lead the discussion of preventing illicit discharge.

Process

a. Take 15-20 minutes to discuss the impact that business has on water around them and the importance of illicit discharge prevention. Also plan for questions beyond the initial discussion.

b. Emphasize the potential impact businesses have on Mill Creek and Jordan River.

c. Give them material suited for their situation. Ex: Salt Lake County's "stream care guide", We All Live Downstream Chap stick, etc. and guide them to the City's website.

Documentation

a. Document businesses visited, persons attended, and contact information.

IDDE – In-coming Call

Preparation

a. Have a system in place to receive phone calls and collect information regarding suspected illicit discharges.

Process

a. Use the Incoming Call Report to collect the appropriate information from the caller. Then, transfer the Incoming Call Report to the proper authority (i.e. department head, storm water specialist, construction inspector, code enforcement officer, or other assigned personnel).

b. Review incidents reported by citizens using the Incoming Call Report and reports in Utilisync on an annual basis to look for patterns of illicit discharges and to evaluate the call-in inspection program.

Clean up

None

Documentation

a. File completed form (i.e. Incoming Call Report in Utilisync).

IDDE – Incoming Call Report Form
(For Phone Operator)

Date of Illicit Discharge_____ Time _____ Duration_____

Address of Discharge_____

Name of person discharging (If applicable)_____

Name & phone number of person making the call_____

Chemical name or identity of any substance involved in the release _____

_____

Is substance hazardous? _____

Estimate of Quantity Spilled? _____

Did the illicit discharge enter a waterbody? (Lake or Stream)_____

Did the illicit discharge enter the storm drain system? (Manhole or storm drain pipe)_____

Any known or anticipated health risks for exposed individuals associated with the emergency spill:

_____

See Incident Response Flow Chart

Responder: _____

Action taken:

IDDE – Spill Response and Cleanup Procedures

Municipalities are responsible for any contaminant spill or release that occurs on property they own or operate. Particular areas of concern include any facilities that use or store chemicals, fuel oil or hazardous waste, including schools, garages, PW yards, and landfills. Implementation of proper spill response and cleanup procedures can help to mitigate the effects of a contaminant release.

Responding to a Spill

In the event of a spill, follow these spill response and cleanup procedures:

a. Notify the facility supervisor, and/or the facility safety officer.
b. Assess the contaminant release site for potential safety issues and for direction of flow.
c. With proper training and personal protective equipment, complete the following:
    i. Stop the contaminant release;
    ii. Contain the contaminant release through the use of spill containment berms or absorbents;
    iii. Protect all drains and/or catch basins with the use of absorbents, booms, berms or drain covers;
    iv. Clean up the spill using appropriate absorbent, equipment and containers ;
    v. Dispose of all contaminated products in accordance with applicable federal, state and local regulations.
        1. Soils contaminated with petroleum shall be handled and disposed of as described in Utah Administrative Code R315-315-8, Petroleum Contaminated Soils.
        2. Products saturated with petroleum products or other hazardous chemicals require special handling and disposal by licensed transporters. Licensed transporters will pick up spill contaminated materials for recycling or disposal. Save the shipping records for at least three years.
        3. Used oil contaminated products:
            a) Ensure that absorbents do not contain any free liquids (pass a paint filter test).
            b) If absorbents contain no free liquid they may be discarded in the trash, unless contaminated with another hazardous waste.
                I. It is acceptable to mix the following fluids and handle them as used oil:
                    1) Used Motor Oil;
                    2) Hydraulic Fluid;
                    3) Power Steering Fluid;
                    4) Transmission Fluid;
                    5) Brake Fluid;
                    6) Gear Oil.
                II. Do not mix the following materials with used oil, store each separately:
                    1) Gasoline;

2) Antifreeze;
3) Brake and Carburetor Cleaners;
4) Cleaning Solvents;
5) Other Hazardous Wastes.

c) If absorbents contain free liquid they should be placed in separate metal containers with tight fittings lids, labeled "Oily Waste Absorbents Only".

d. If you need assistance containing and/or cleaning up the spill, or preventing it from discharging to a surface water (or an engineered storm drain system), contact your local Health Department using the number listed below, however in the case of an emergency call 911;
   i. Salt Lake: 801-580-6681

e. Contact the Utah DEQ 24-hour spill reporting notification line, at 801-536-4123;
   i. The following scenarios are subject to Utah DEQ reporting requirements:
      1. Spills of 10 gallons or more of petroleum to the environment;
      2. Spills one pound or greater of hazardous chemicals to the environment;
      3. Spills from passenger vehicle accidents are exempt.

Procedures for Reporting Spill Response

When contacting emergency response personnel or a regulatory agency, or when reporting the contaminant release, be prepared to provide the following information:

a. Your name and the phone number you are calling from.
b. The exact address and location of the contaminant release.
c. Specifics of release, including:
   i. What was released;
   ii. How much was released, which may include:
      1. Pounds;
      2. Gallons;
      3. Number of containers.
d. What was impacted by the spill?
   i. Pavement;
   ii. Soil;
   iii. Drains;
   iv. Catch Basins;
   v. Water Bodies;
   vi. Public Street; and
   vii. Public Sidewalk.
e. The concentration of the released contaminant.
f. What/who caused the release?
g. Is the release being contained and/or cleaned up, or is the response complete.
h. Type and amount of petroleum stored on site, if any.
i. Characteristics of contaminant container, including:

ii. Tanks;
iii. Pipes;
iv. Valves.

Maintenance and Prevention Guidance

Prevention of spills is preferable to even the best response and cleanup. To prevent the effects of a contaminant release, provide proper maintenance and inspection at each facility.
To protect against contaminant release adhere to the following guidance:

a. Ensure all employees are properly trained to respond in the case of a spill, understand the nature and properties of the contaminant and understand the use of spill control materials and personnel safety equipment. Maintain training records of current personnel on site and retain training records of former personnel for at least three years from the date last worked at the facility;
b. Provide semi-annual maintenance and inspection at all municipal facilities, paying particular attention to underground storage tanks. Maintain maintenance and inspection records on site;
c. Implement good management practices where chemicals and hazardous wastes are stored;
    i. Ensure storage in closed containers inside a building and on an impervious surface;
    ii. If storage cannot be provided inside, ensure secondary containment for 110 percent of the maximum volume of the largest storage container;
    iii. Locate storage areas near maintenance areas to decrease the distance required for transfer;
    iv. Provide accurate labels, MSDS information and warnings for all stored materials;
    v. Regularly inspect storage areas for leaks;
    vi. Ensure secure storage locations, preventing access by untrained or unauthorized persons;
    vii. Maintain accurate records of stored materials.
d. Replace traditional hazardous materials such as pesticides and cleansers with non-hazardous products such as bio-lubricants which can reduce response costs in the case of a spill;
e. Maintain an oil and grease spill response kit with the following materials, at a minimum, at each facility:
    i. 5 gallon bucket with screw top lid and handle
    ii. 10 gallons of sand
    iii. 200 pounds of Floor Dry absorbent
    iv. Drain covers
    v. Spill containment berms
    vi. (4) 3' absorbent socks
    vii. (16) 16" x 18" absorbent pads
    viii. Goggles
    ix. Nitrile gloves
    x. Disposable bags to dispose of used materials
    xi. Laminated contacts list shall include the following names and numbers:
        1. Storm Water Division;
        2. Facility Supervisor;

3. Local Health Department;
4. Local Fire Department;
5. Utah DEQ spill report notification line;
6. Household Hazardous Products Hotline;

Attachments

a. Spill Response and Cleanup Contact List

IDDE – Investigating and Reporting Illicit Discharge

Preparation

a. Have a system in place to investigate and report an incident involving illicit discharges.

Process

a. Following the reception of an Incoming Call Report proceed to the location of the reported discharge to collect field information such as statements and physical evidence of the discharge.

b. Contact Salt Lake County Health Department if Illicit Discharge is a danger to public health.

c. If an illicit discharge of an unknown source is confirmed, follow the procedure SOP IDDE - Tracing Illicit Discharges.

d. If an illicit discharge of a known source is confirmed, follow the procedure of SOP IDDE - Removing Illicit Discharges.

e. As a result of investigating the incident, determine if it is an isolated occurrence and resolve with remediation and instruction. If the incident is part of a pattern of non-compliance or indicates that the incident was caused by a known breach of a regulation or permit condition, escalated enforcement including a citation may be required. Enforcement action will include an appeals process as stipulated in city ordinance.

Clean up

a. Follow the procedure SOP IDDE - Removing Illicit Discharges.

Documentation

a. File all completed forms (i.e. Incoming Call Report, IDDE report and catch basins cleaning, storm drain cleaning in Utilisync.

b. Document the draft and final report and any further action taken in Utilisync

IDDE - Opportunistic Illicit Discharge Observation by City Employees

Preparation

a. Be alert for potential illicit discharges to the municipal storm water system while going about normal work activities.

Process

a. Immediately call the storm water department if you see evidence of an illicit discharge to the storm water system. An Incoming Call Report will be documented by the Storm Water Department.

b. Assess the general area of the illicit discharge to see if you can identify its source.

c. Whenever possible, take photographs of the suspected illicit discharge.

Documentation

a. Incoming Call Report in Utilisync

IDDE - Outfall Dry Weather Screening

Preparation

a. Check recent weather conditions and ensure the inspection takes place sometime after fourteen consecutive days of dry weather.

b. Gather necessary sampling equipment including tape measure, sample bottle/jar, tablet with UtiliSync and necessary forms, flashlight, and camera.

c. Identify outfall locations

Process

a. Locate appropriate outfall and ensure safe and accurate working conditions.

b. Perform inspection following Dry and Wet Weather Screening form found within UtiliSync Website.

c. Steps for carrying out inspection if discharge is observed at the outfall during Dry Weather Screening :

    i. Collect sample for field evaluation. Ensure the use of clean and sound sampling equipment.

    ii. Observe and record relevant data from sample at the time of sampling and after one hour of settling.

    iii. Complete all of the applicable areas on the Utilisync form.

    iv. Compare past sampling data if available and follow appropriate protocol if illicit discharge is suspected or found.

Clean Up

a. Dispose of water sample to sanitary sewer and dispose of sampling containers.

b. Clean all instruments involved in sampling with deionized water .

Documentation

a. Follow Dry Weather Screening form within UtiliSync to maintain documentation. Forms are backed up within UtiliSync and the City's system and hard copies can be downloaded within the application.

IDDE – Removing Illicit Discharges

Preparation

a. Obtain available property ownership information for the source of the illicit discharge.

b. Geo-locate position of discharge using Utilisync.

c. Determine if there is a third-party involved in the cleanup action and review their remediation plan.

Process

a. Determine the financially responsible party

    i. Private Property Owner:
        1. Contact and communicate with owner about the incident and the cleanup action to be taken.
        2. Issue notice of violation for cases of municipal ordinance.
        3. Determine schedule for removal.

    ii. Municipal Facility:
        1. Notify appropriate municipal authority or department head.
        2. Determine Schedule for removal.

b. Take measures to cease illicit discharge.

    i. Issue a Stop work Order if necessary and cease the unlawful activity.
    ii. Suspend access to storm drain or conveyance system.

c. Direct responsible party to initiate repairs/cleanup/corrections.

    i. Coordinate with enforcement officials for escalating penalties in accordance with municipal ordinance.
    ii. Contact Salt Lake County Health Department if Illicit Discharge is a danger to public health.
    iii. Carry out clean up and remediation if the municipality is responsible for the discharge, and schedule with appropriate department supervisors.

d. Document occurrence using UtiliSync.

    i. Take thorough notes regarding communication and compliance with responsible party.
    ii. Follow form in UtiliSync and document details about spill including timeline, location, and involved groups.

iii. Photograph spill, clean up, and anything else that will provide context for the occurrence.

Follow Up

a. Remain on site or return when cleanup is being carried out. Document proof of cleanup with a receipt or invoice if you are not able to witness cleanup in person.

b. Conduct follow up report using UtiliSync and document that the site has been restored.

c. Educate responsible party about storm water impacts and water quality, and provide educational material for them to keep. Follow the IDDE - Business Education SOP.

Documentation

a. Keep thorough notes throughout the event that provide context and details for anyone to understand the event from beginning to end.

b. Photograph before, during and after cleanup/restoration procedures.

c. Fill out IDDE form and Follow up Report form in UtiliSync.

IDDE - Tracing Illicit Discharges

Preparation

a. Review / consider information collected when illicit discharge was initially identified and documented using Incoming Call Report Form or Outfall Inspection Form.

b. Obtain storm drain mapping for the area of the reported illicit discharge.

c. Gather all necessary equipment including: tape measure, clear container, clipboard with necessary forms, flashlight, and camera (optional).

Process

a. Survey the general area and surrounding properties to identify potential sources of the illicit discharge as a first step.

b. Trace illicit discharges using visual inspections of upstream points as a second step. Use available mapping to identify tributary pipes, catch basins, etc.

c. If the source of the illicit discharge cannot be determined by a survey of the area or observation of the storm drain system, then consider the following additional steps:

    1. Use weirs, sandbags, dams, or optical brightener monitoring traps to collect or pool intermittent discharges during dry weather.

    2. Smoke test or televise the storm drain system to trace high priority, difficult to detect illicit discharges.

    3. Dye test individual discharge points within suspected buildings.

    4. Consider collecting bacterial samples of flowing discharges to confirm/refute illicit discharge.

d. If the source is located, follow SOP IDDE - Removing Illicit Discharges.

e. If the source cannot be found, add the location to a future inspection program.

Clean up

a. Follow SOP IDDE - Removing Illicit Discharges.

Documentation

a. Document tracing results for future reference on IDDE Response form in Utilisync

IDDE – Priority Area Inspection

Preparation

a. Know the past and present weather conditions. Conduct inspections during dry weather periods.

b. Identify areas that most likely fit the following descriptions:
- Older Infrastructure (oldest part of the city. So. of 2700 So. and East of 300 East)
- Industrial, commercial, or mixed use areas (West of State St. 2100 So. to 3900 So.)
- Illicit discharges (North of Mill Creek and south of I-80, State Street west to Main St. Main St. west to 300 W north of I-80.
- Area with older sewer lines (area within the current SSLC sewer system).
- Areas upstream of sensitive water bodies (Businesses west of 900 W from 2100 So to 3900 So.).

c. Identify each inspection point with a consistent and unique identifier. For example "PA001".

d. Gather all necessary equipment including: personal protective equipment, tape measure, clear container, electronic tablet with installed Utilisync app, flashlight, and camera.

e. Have maps available showing outfall locations and identifiers (GIS mapping).

f. Review inspection point description and observations from previous inspections in Utilisync so the inspection point can be accurately identified and observations compared.

Process

a. Perform an inspection of a minimum of 20% of all priority areas every year. Whenever possible, use the same personnel for consistency in observations.

b. Use maps and previous inspection reports to confirm the inspection area identity and location.

c. Set up traffic control as required.

d. Pull manhole lid or grate to perform inspection if needed.

e. If dry weather flow is present at the inspection point, then document and evaluate the discharge by completing the following steps:
    i. Collect a field sample for visual observation in a clean, clear container, and in a manner that avoids stirring up sediment that might distort the observation.

ii. Complete the Priority Area Inspection Form using Utilisync.
iii. Compare observations to previous inspections.
iv. If the flow does not appear to be an obvious illicit discharge (e.g., flow is clear, odorless, etc.), attempt to identify the source of the flow (groundwater, intermittent stream, irrigation, etc.)
v. Take photo of inspection point structure and collected sample in container (as needed) for Utilisync inspection report.
vi. Submit report thru Utilisync.

f. If an illicit discharge (such as raw sewage, petroleum products, paint, etc.) is encountered or suspected, follow the procedure of SOP IDDE – Tracing Illicit Discharge.

Actions

a. Follow procedures identified in the following SOPs as needed:
    i. SOP IDDE – Tracing Illicit Discharge
    ii. SOP IDDE – Removing Illicit Discharge

Documentation

a. Priority area inspection is completed and stored in Utilisync.

Preparation

a. Make sure the State Chemical Handling Certification is complete and up-to-date before personnel handling of any chemicals.

b. Calibrate fertilizer and pesticide application equipment to avoid excessive application.

c. Use pesticides only if there is an actual pest problem and periodically test soils for determining proper fertilizer use

d. The application of fertilizers, herbicides or pesticides should coincide with the manufacturer's recommendation for best results ("Read the Label").

e. Know the weather conditions. Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low(less than 5 mph).

f. Refer to SDS for handling and disposal of waste.

Process

Always follow the manufacturer's recommendations for mixing, application and disposal. ("Read the Label").

Do not mix or prepare pesticides for application near storm drains. Preferably mix inside a protected area with impervious secondary containment (preferably indoors) so that spills or leaks will not contact soils.

Employ techniques to minimize off-target application (e.g. spray drift, over broadcasting.) of pesticides and fertilizers.

Clean-up

Sweep pavements or sidewalks where fertilizers or other solid chemicals have fallen, back onto grassy areas before applying irrigation water.

Triple rinse containers, and apply rinse water as product. Dispose of unused pesticide as hazardous waste if classified as such..

Always follow federal and state regulations governing use, storage and disposal of fertilizers, herbicides or pesticides and their containers. ("Read the Label")

Documentation

Keep copies of SDS sheets for all pesticides, fertilizers and other hazardous products used in a central location.

Record fertilizing and pesticide application activities, including date, individual who did the application, amount of product used and approximate area covered.

PARKS – Cleaning Mobile and Portable Equipment

Preparation

a. Review process with all Parks employees

Process

a. Wipe off dirt, dust and fluids with disposable towel

b. Wash equipment in approved wash station inside the Public Works garage/shop area (must be trained on equipment prior to use by a Public Works supervisor).

Clean-up

a. Dispose of towels in proper trash receptacle

b. Sweep and wash station floor and dispose of debris in trash receptacle.

PARKS – Mowing and Trimming

Preparation

Identify equipment to be used.

Check the oil and fuel levels of the mowers and other equipment; and fill if needed.

Do not fill oil or other fluids near storm drains, Preferably fill inside a protected area with impervious secondary containment (preferably indoors) so that spills or leaks will not contact soils

Process

Install temporary catch basin protection on affected basins

Put on eye and hearing protection

Mow and trim the lawn

Sweep or blow clippings to grass areas

Remove inlet protection

Clean-up

Mowers are to be scraped and brushed at the Parks shop. Dry spoils are swept and disposed in trash receptacle.

Wash equipment in approved wash station (see Parks-Cleaning Equipment SOP).

PARKS – Open Space Management

Preparation

a. Provide regular observation and maintenance of parks, golf courses, and other public open spaces.

b. Identify public open spaces that are used for storm water detention/retention and verify that areas are included on the storm drain system mapping, inspection schedules, and maintenance schedules.

Process

a. Ensure that any storm drain or drainage system components on the property are properly maintained.

b. Avoid placing bark mulch (or other floatable landscaping materials) in storm water detention areas or other areas where storm water runoff can carry the mulch into the storm drainage system.

c. Follow all SOPs related to irrigation, mowing, landscaping, and pet waste management.

d. Ensure there is sufficient amount of trash containers in the area, and that they are clearly marked for the appropriate type of discarded material.

Clean Up

a. Keep all outdoor work areas free of litter and other debris. Clean by sweeping instead of washing whenever possible. If areas must be washed, ensure that wash water will enter a landscaped area rather than the storm drain. Do not use soap for outdoor washing.

Documentation

a. Document any observed deficiencies for correction or repair.

Preparation

a. Adopt and enforce ordinances that require pet owners to clean up pet wastes and use leashes in public areas. If public off-leash areas are designated, make sure they are clearly defined. Avoid designating public off-leash areas near streams and water bodies.

b. Whenever practical and cost effective, install dispensers for pet waste bags and provide disposal containers at locations such as trail heads or parks where pet waste. Provide signs with instructions for proper cleanup and disposal.

Process

a. Check parks and trails for pet waste. Remove and dispose of as needed.

b. Check public open space for pet waste prior to mowing and watering.

c. Provide ordinance enforcement as needed.

Clean up

a. Remove all pet waste, and discard in a covered waste container. Waste will then be taken to a solid waste disposal facility.

Documentation

a. Document problem areas for possible increased enforcement and/or public education signs.

PARKS – Planting Vegetation (Starters)

Preparation

Call the Blue Stakes Center of Utah at least 2 working days before any digging to reveal the location of any underground utilities. Call 811 or 1-800-662-4111 to make request.

Decide where any spoils will be taken.

Process

Dig holes placing spoils on tarps or plastic near the hole where they may easily be placed back around roots. Avoid placing spoils in the gutter.

Bring each plant near the edge of the hole dug for it.

Check the depth of the hole, and adjust the depth if necessary. The depth of the hole for a tree should be as deep as the root ball, so that the top of the root ball is level with the top of the hole.

Carefully remove pot or burlap.

Place the plant in the hole.

Backfill the hole with existing spoils, compost, and a litter fertilizer if desired. Do not use excessive amendments.

Water the plant.

Stake the plant, if necessary, to stabilize it.

Clean-up

Move any extra spoils into truck or trailer. Place the spoils on a tarp if there is likelihood that some of the dirt would be lost through openings in the bed. Sweep dirt from surrounding pavement(s) into the planted area

Transport spoils to their designated fill or disposal area. . Dispose of the extra dirt at the Public Works facility in the debris area, or in the trash receptacle.

PARKS – Planting Vegetation (Seeds)

Preparation

Call the Blue Stakes Center of Utah at least 2 working days before any digging will be done, to reveal the location of any underground utilities. Call 811 or 1-800-662-4111 to make request.

Decide on the application rate, method, water source, and ensure adequate materials are on hand.

Grade and prepare the soil to receive the seed. Place any extra soil in a convenient location to collect.

Process

Place the seed and any cover using the pre-determined application method (and rate).

Lightly moisten the seed

Ensure that regular water method is working properly and limit amount of over spray on paved areas.

Clean-up

Move any extra spoils into truck or trailer. Place the spoils on a tarp if there is likelihood that some of the dirt would be lost through openings in the bed.

Sweep dirt, seed, and any cover material from surrounding pavement(s) into the planter area

Transport spoils to their designated fill or disposal area. Dispose of the extra dirt at the Public Works facility in the debris area, or in the trash receptacle.

PARKS – Transporting Equipment

Preparation

a. Determine equipment needed for transport and method (trailer, truck bed) needed to transport equipment.

b. Conduct pre- trip inspection of equipment

Process

a. Load and secure equipment on trailer or truck using chains or tie down straps.

b. Load and secure fuel containers for equipment usage

c. Off load equipment

d. Store equipment and trailer in proper location

Clean-up

a. Conduct post-trip inspection of equipment and check for vehicle fluid leaks

b. Wash equipment, if needed, according to the SOP for Cleaning Equipment SOP

Documentation

a. Report any leaks, defects or any problems to immediate supervisor that are noticed during pre or post trip inspections.

STORM DRAIN – Catch Basin Cleaning

Preparation

Clean sediment and trash off grate.

Do visual inspection on outside of grate.

Identify lid type for proper removal of grate cover.

Do inside visual inspection to see what needs to be cleaned.

Process

Remove cover using proper lift and pulling techniques and tools.

Clean the basin using a high powered vacuum truck to remove standing water and sediment.

Use a high pressure washer to break up any remaining material in the catch basin, while capturing the slurry with the vacuum.

After catch basin is clean, use a camera or visual check to determine the condition of the connecting pipes. If there is greater than one-inch of sediment in the pipe send the rodder of the vacuum truck into the pipe that is designated for cleaning and pull back sediment that might have gotten down stream of pipe.

Replace cover and make sure it is secure.

Move truck to next catch basin.

Clean-up

When vacuum truck is full of sediment take it to the designated location to dump all the sediment out of truck into a drying bed. Located at Central Valley Water Reclamation Facility

Wash down area including the truck ramp into the drying bed area before leaving the designated dump location at the Central Valley Water Reclamation Facility.

Documentation

Keep logs of number of catch basins cleaned.

b. Record the amount of waste collected and number of catch basins cleaned and the area they were cleaned in using Utilisync.

STORM DRAIN – Detention Pond Cleaning

Preparation

Schedule the Pond cleaning work for a time when dry weather is expected.

Remove any sediment and trash from grates, placing it in a truck for disposal.

Do a visual inspection to make sure any grates, structures, manholes, boxes, and pipes are in good working order. Remove manhole covers and grates as necessary for inspecting.

a. Provide outlet protection where feasible to minimize the amount of debris that might leave basin during cleaning process.

Process

Start cleaning basin by using backhoe to remove debris and sediment off the bottom.

Continue cleaning structures and pond bottom as necessary by sweeping and shoveling.

Put all material removed from the pond into a dump truck.

Some structures may require use of a high powered vacuum truck. If so use the same procedures described for cleaning catch basins.

Clean-up

After cleaning basins, clean off the concrete pads using dry methods (sweeping and shoveling). Make sure they are swept up and clean.

Take the material that was removed to the landfill (6030 California Ave.)for final disposal.

Documentation

a. Keep logs of each detention basins/pond cleaned including date, and a description of the type of debris removed.

b. Record the amount of waste collected in Utilisync.

STORM DRAIN – Ditch Management

Preparation

a. Maintain access to ditch channels wherever possible.

b. Identify areas requiring maintenance

c. Determine what manpower or equipment will be required.

Process

a. Make the necessary repairs to ensure adequate capacity and flow.

Clean-up

a. Stabilize all disturbed soils.

b. Remove all track out debris from paved surfaces near maintenance site, if applicable.

c. Haul all debris or sediment removed from area to the landfill (6030 California Ave.)

Documentation

a. Record the amount of materials removed or imported.

b. Use "before" and "after" photographs to document activities as applicable.

STREETS – Curb Painting

Preparation

Calculate the amount of paint required for the job

Use water based paints if possible.

Determine whether the wastes will be hazardous or not and the required proper disposal of paint wastes

Determine locations of storm drain inlets and sewer inlets that may need to be protected

Prepare surfaces to be painted without generating wastewater by scraping.

Thoroughly sweep up all paint scrapings and place them in the appropriate solid waste facilities.

If paint stripping is needed, use a citrus-based paint remover whenever possible, which is less toxic than chemical strippers.

Have available absorbent material and other BMP's ready for an accidental paint spill.

Process

Paint curb.

Prevent over-spraying of paints and/or excessive sandblasting

Use drip pans and drop clothes in areas used for mixing paints and painting

Store latex paint rollers and brushes in air tight bags to be reused later with the same color.

Clean-up

Paint out brushes and rollers as much as possible. Squeeze excess paint from brushes and rollers back into the containers prior to cleaning them.

Pour excess paint from trays and buckets back into the paint can containers and wipe with cloth or paper towels. Dispose of the towels according to the recommendations on the paint being used.

Rinse water-based paint brushes in the sink after use. Never pour excess paint or wastewater from cleanup of paint in the storm drain.

Dispose of dry waste collected by placing it in a garbage container. Left-over paint and solvents should be stored for later use (do not place these liquids in the garbage).

Documentation

Write-up/report of any discharges into storm drain system

STREETS– Chip Seal

Preparation

a. Clean and dry areas where materials are to be applied.

b. Apply temporary covers to manholes and catch basins to prevent oil and materials from getting inside of them as well as install all other necessary BMPs

c. Notify all affected property owners

d. Traffic Control Plan approval/set up

Process (APWA Specifications)

a. Apply emulsion at recommended rate.

b. Spread chips closely behind emulsion distributor, slowly so the chips do not roll when they hit the surface.

c. Roll chips with the chip spreader rolling the entire surface twice.

d. Maximum speed 5 mph.

Clean-up

a. All loose aggregate is removed from the roadway by sweeping it up (see SOP for Street Sweeping).

b. Excessive asphalt applications and spills are removed with shovels and scraping tools.

c. Remove the temporary covers from manholes and catch basins. If it appears that any chip seal materials have gotten into the inlet boxes, remove the material according to the SOP for inlet boxes.

d. Dispose of the waste material that has been swept and scraped and take it to the landfill (6030 California Ave.).

Documentation

a. Record location and date on the maintenance database and map

STREETS– Slurry Seal

Preparation

a. Remove weeds from the roads. Sweep areas where materials are to be applied, and allow drying, if necessary. Verify that existing pavement has been inspected for proper drainage.

b. Cover/protect catch basins and manholes.

c. Notify all affected property owners

d. Traffic Control Plan approval/set up

Process

a. Apply materials in a smooth and uniform manner. Slurry material should not run onto adjacent pavement surface, curb and gutter or waterways. Follow APWA specifications.

Clean-up

a. If loose aggregate is remaining in street or curb, sweep it up. (see SOP for Street Sweeping).

b. Ensure that excess emulsion materials are removed from the site and stored for later use in an area or container that is not exposed to the weather.

c. Remove covers/protection from catch basins, manholes and valves etc.

Documentation

a. Record location and date on the maintenance database and map

STREETS– Overlays and Patching

Preparation

a. Check weather conditions and avoid working in rain or any precipitation.

b. Set up /establish a traffic control for road with necessary detours, etc.

c. Measure and mark locations of manholes and valves on the curb

d. Raise manhole lids and valves to elevation of new asphalt surface with riser rings.

e. Manholes and catch basins are covered as needed to prevent oil and materials from getting inside the structures or system.

f. Cracks should be properly sealed. Alligator cracks and potholes should be removed and patched. Rutting should be milled.

g. Surface should be clean and dry.

h. Uniform tack coat applied and cured prior to placement of overlay.

i. If milling is required, install inlet protection as needed.

Process (APWA Specifications)

a. Check hot asphalt mix for proper temperature, percentage asphalt, gradation, air voids and any other agency requirements.

b. Apply the overlay/patch in the prepared area.

c. Surface texture should be uniform with no tearing or scuffing.

d. Rolling should be done to achieve proper in-place air void specification.

Clean-up

a. Manhole and catch basin covering should be removed as soon as the threat of imported materials entering the system is reduced and prior to a storm event.

b. After pavement has cooled, sweep gutters to remove loose aggregate. (see SOP for Street Sweeping).

Documentation

a. Record location and date on the maintenance database and map

STREETS– Crack Seal

Preparation

a. Cover Manholes, catch basins and water valves to prevent oil and materials from getting inside the structures or system.

b. Remove weeds from the road

c. Air-blast the cracks to remove sediments from the crack to allow for proper adhesion.

d. Ensure that surface is clean and dry.

Process (APWA Specifications)

a. Proper temperature of material should be maintained.

b. Sufficient material is applied to form the specified configuration.

Clean-up

a. Use shovels and/or scrapers to remove excessive sealant application or spills and dispose of them properly.

b. Sweep all loose debris from the pavement and dispose of it in the local landfill. (see SOP for Street Sweeping).

Documentation

a. Record location and date on the maintenance database and map

STREETS– Shouldering and Mowing

Preparation

a. Set up temporary traffic control devices according to part VI of the Utah Manual Uniform Traffic Control Devises (UMUTCD).

Process

a. Place import material as needed and perform grading to achieve proper drainage.

b. Apply mulch clippings to help reduce the amount of supplemental fertilizer required

Clean-up

a. Clean any loose material off asphalt or gutter and place on spoils pile.

Documentation

a. Record location and date on the maintenance database and map

STREETS– New/Replacement Concrete Work

Preparation

a. Store dry and wet materials in a covered location, away from drainage areas

b. Determine how much new concrete will be needed.

c. Locate or construct approved concrete washout facility.

d. Install inlet protection as needed.

Process

a. Moisten sub base just prior to placing new concrete. This helps keep the soil from wicking moisture out of the concrete into the ground.

b. Remove any damaged concrete that may need to be replaced.

c. Prepare and compact sub-base.

d. Set forms and place any reinforcing steel that may be required.

e. Place new concrete in forms according to APWA specifications

f. Consolidate new concrete

g. Screed off surface

h. Let concrete obtain its initial set

i. Apply appropriate surface finish

j. Remove forms when concrete will not slump

Clean-up

a. Perform washout of concrete trucks and equipment in a portable tray or skip at the pour site or at the Public Works facility in the designated concrete wash out area.

b. Cement and concrete dust from grinding activities is swept up and removed from the site.

c. Sweep dirt or debris from street and gutter and dispose of in appropriate solid waste facilities.

STREETS– Garbage Collection and Storage

Preparation

a. Locate dumpsters and trash cans with lids in convenient, easily accessible areas.

b. Provide properly-labeled recycling bins to reduce the amount of garbage collected.

c. Provide training to employees to prevent improper disposal of general trash.

Process

a. Inspect garbage bins for leaks regularly, and have repairs made immediately by assigned person.

b. Locate dumpsters on a flat, impervious surface that does not slope or drain directly into the storm drain system.

c. Install berms, curbing or vegetation strips around storage areas to control water entering/leaving storage areas.

d. Keep lids closed when not actively filling dumpster.

Clean-up

a. Keep areas around dumpsters clean of all garbage.

b. Have garbage bins emptied as often as needed to keep from overfilling.

c. Wash out bins or dumpsters as needed to keep odors from becoming a problem. Wash out in properly designated areas only that report to the septic system. .

STREETS– Snow Removal and De-icing

Preparation

a. Store de-icing material under a covered storage area or in an area where water coming off the de-icing materials is collected and delivered to the sanitary sewer or reused as salt brine.

b. Wash down vehicles (if necessary) in approved washout area before preparing them for snow removal.

c. Calibrate spreaders to minimize amount of de-icing material used and still be effective

d. Provide vehicles with spill cleanup kits in case of hydraulic line rupture or other spills

e. Train employees in spill cleanup procedures and proper handling and storage of de-icing materials

f. Provide maintenance for vehicles in covered area

Process

a. Load material into trucks carefully to minimize spillage

b. Periodically dry sweep loading area to reduce the amount of de-icing materials exposed to runoff

c. Distribute the minimum amount of de-icing material to be effective on roads

d. Turn spreader off while loading and any other time the vehicle is not moving in the forward position.

e. Park trucks loaded with de-icing material inside when possible

Cleanup

a. Sweep up all spilled de-icing material around loading area

b. Clean out trucks after snow removal duty in approved washout area

c. If sand is used in de-icing operations, sweep up residual sand from streets when weather permits

STREETS – Salt and Sand, Mixing and Storing

Description: This section contains information on proper storage and loading of de-icing material in order to prevent materials from entering into a storm drain system.

Applicability: Snow removal or application of de-icing materials.

Preparation

a. Store materials on impervious surface only.

Process

a. Mix materials in summer months.

b. After mixing materials store in covered shed.

c. Mixed materials are ready for winter use.

Clean-up

a. Sweep up/Clean up mixing areas.

b. Wash out trucks/loaders in approved wash bays.

Documentation

None

STREETS– Street Sweeping

Preparation

a. Prioritize cleaning routes to repeat cleaning in areas with the highest pollutant loading.

b. Increase sweeping frequency just before the rainy season, unless sweeping occurs consistently in all posted areas throughout the year.

c. Perform preventative maintenance and cleaning after each shift on sweepers to increase availability and maintain their efficiency

d. Streets are to be swept as needed or as specified by the city. Street maps are used to ensure all streets are swept at a specified interval

e. Ensure that the operator is fully trained

Process

a. Drive street sweeper safely and pick up debris

b. When full, take the sweeper to an approved street sweeper cleaning station and deposit the debris.

Clean-up

a. Refer to the Sweeper Debris Dumping and Wash out Station SOP

Documentation

a. Keep accurate logs to track streets swept and streets still requiring sweeping.

b. Log the amount of debris collected and hauled off.

STREETS - Sweeper Debris Dumping and Wash out Station

Description: This contains procedures for the proper operation of this station.

Application: To ensure that no sweeper debris is dumped onto pervious surface and that no wash water or debris leaves the station, polluting the surrounding area or Waters of the State (groundwater, or entering the storm water system).

Preparation

a. Identify the container and the proper location (dump truck, bulk waste trailer or dumpster)for dumping the debris before washing out,

b. Be sure the debris container is not located near a storm drain.

c. Be sure that the equipment is placed on the asphalt on the north side of the wash station.

d. Inspect the station for obvious problems such as excess debris, flow obstructions and or any other deficiencies with the station.

Process

a. Make sure that all debris are being placed into the appropriate container

b. Debris spillage is to be swept and shoveled into the designated container.

c. Ensure the proper placement of the equipment to be cleaned.

d. Only clean the debris body of the equipment and the immediate surrounding area.

e. While cleaning the debris body, make sure the wash water is not leaving the station.

f. When washing is complete move the equipment from the asphalt pad and wash the area where the equipment was parked.

g. After washing down asphalt pad remove any debris on the grate over the underground storage tank, and place it in the container.

Clean up

a. If there is a lid or closer for the debris container be sure to close it to prevent wind or rain from causing a breach of the container.

b. Be sure to inspect the area around container and sweep/ shovel any loose debris into the container.

c. Check to see how full the container is. If it is 75% full schedule with supervisor to have it emptied at the Landfill located at 6030 W California Ave.

d. Be sure to turn water off.

e. At the end of shift be sure to pump the tank using the pump that is designated (located in the public works garage) for the station, into the clean out location on the north side of grease trap (sanitary sewer).

f. Once the tank has been pumped down replace the clean out cap and ensure the station is clean before leaving the station.

Documentation

a. After the site is clean and tank has been pumped down document any deficiencies with the station or with the container.

STREETS– Transporting Soil and Gravel

Preparation

a. Dry out wet materials before transporting.

b. Spray down the surface of dusty materials to suppress blowing dust.

c. Make sure you know and understand the SWPPP requirements for the site you will be working at.

d. Determine the location that the truck and other equipment will be cleaned afterwards

Process

a. Prevent vehicle tracking by using a stabilized construction entrance to access or leave the site where materials are being transported to/from the site.

b. Cover truck bed with a secured tarp before transporting.

c. Follow the SWPPP requirements for the specific site to/from which the materials are being hauled.

d. Make sure not to overfill materials when loading trucks.

Clean up

a. Use sweeper to clean up any materials tracked out on the roads from site. (see SOP for Street Sweeping).

b. Wash out truck and other equipment when needed in properly designated areas.

Documentation

a. None

STORM WATER – Preconstruction SWPPP Review

Preparation

a. Coordinate with Building Department and Engineering Department on scheduling a preconstruction meeting.

b. Be familiar with drainage, SWPPP, and the site layout by consulting the construction projects plans and SWPPP requirements.

c. Prepare to lead the discussion on Storm Water topics including:
   - Inspections
   - BMP requirements
   - Post construction plans for long term storm water management measures

d. Set up project in Utilisync

Process

a. Join with the representatives from the building and engineering departments and the construction project representative in a discussion of the project.

b. Follow the SWPPP Review Checklist and fill in the appropriate information.

c. Discuss storm water concerns and requirements from the project's plans.

d. Discuss and approve post-construction plans to establish minimum control measures that align with long term storm water management measures for new and re-developed sites as required and defined by the Utah DWQ. Control measures are selected using references to DWQ's "A Guide to Low Impact Development within Utah" Appendix B "Storm Water Quality Report Template" and the Storm Water Design Manual of South Salt Lake City.

e. Convey the City's commitment to water quality and compliance to permit requirements.

f. Perform an initial inspection of the property to note concerns that were not covered in the preconstruction meeting.

g. Complete SWPPP review in Utilisync and send report with comments to the contractor and Permits Department.

Documentation

a. Follow the SWPPP Preconstruction Review SOP Checklist and record all relevant information.

b. Retain a copy of this document for City records. Include any review comments in Cityworks.

STORM WATER – Construction Site Inspection

Preparation

a. Bring PPE including: hard hat, safety glasses, safety toe boots, high visibility vest, etc.

b. Review site map and SWPPP looking for points of concern for erosion and sedimentation, clean-up housekeeping in the surrounding areas.

c. Prepare documentation in UtiliSync website on iPad

    i. Ensure contractor or superintendent has completed preconstruction requirements such as SWPPP, NOI, and building permits.

    ii. Upload GPS or spatial data for site location.

Process

a. Arrive at construction site and communicate with site Supervisor if they are present.

b. Ensure SWPPP, plans, and permits are on site or are available, and confirm that the SWPPP has been implemented as approved.

c. Walk site and follow inspection form checklist, including taking photographs of features requiring action. Is sedimentation, erosion, environmental contamination and BMPs being managed on this site?

d. Confirm deficiencies within the site and determine their cause. Communicate these issues to the site supervisor, and then take appropriate action.

Documentation

a. Follow inspection form outlined in UtiliSync including detailed notes about outstanding issues or questions.

b. Take photographs of compliance issues and include them in report.

Follow up

a. If further action is required carry out a Follow Up Report found within the construction site feature in UtiliSync.

STORM WATER - On-Call Standard Operating Procedures

Description: To establish Standard Operating Procedures for on-call staff.

a. Public Safety Dispatcher shall contact on-call staff when an emergency exists. An emergency exists when:
    i. Sanitary sewer back up inside a private structure or
    ii. Sanitary sewer over flow in the public right of way or
    iii. Damage to City infrastructure or property that has or may occur or
    iv. Damage to private property that has been caused by sanitary sewer back or
    v. Any storm drain back up that is impeding vehicle or foot traffic or
    vi. Any flooding caused by large storms or
    vii. Hazardous spill, leaks or discharges that are impacting the environment or have the potential too.

b. From 4:00pm to 7:30am on weekdays and around-the-clock (24 hours) on week-ends, holidays, Wastewater Division has the following staff on-call:
    i. Wastewater Collection System Operator
    ii. Storm water Technician
    iii. Public Safety Dispatcher shall request on-call Wastewater Division employees to
    - Locate underground utilities
    - Assist other Departments or Divisions as requested
    - Any thefts or break in to Wastewater Division facilities

c. Regular Duties of the Wastewater Collection System Operator on-call personnel
    i. Daily physical checks of sanitary sewer pump station on weekends and holidays
        1. To ensure proper function
        2. Security
    ii. Checking SCADA system once per weekend for
        1. Proper pump station function
        2. Proper SCADA system function

d. Cell Phone
    i. On-call staff must carry a cell phone at all times or keep them within hearing distance.
    ii. On-call staff shall ensure their cell phone is turned on and the battery is charged.
    iii. Public works Administrative Assistant is responsible for preparing and updating a current and accurate on-call list. The list shall contain the names of on-call staff and their specialty along with their cell phone number and home number. The Wastewater and Storm Water Division Managers must approve any change to on-call list.
    iv. A monthly on-call list will be maintained. Assignments are for a period of two (2) weeks (7:30am Friday morning until the 2nd following Friday morning @ 7:30am).

v. Public works Administrative Assistant is responsible for ensuring that a current on-call list is provided to Public Safety Dispatch.

e. On-Call Staff Are Required to Respond to Public Safety Dispatcher
    i. Public Safety Dispatcher will call on-call staff in this order:
    ii. Cell Phone – If no response, Public Safety Dispatcher calls the
    iii. Home Phone – If no answer, Public Safety Dispatcher will call,
    iv. The on-call personnel in either the Streets Div. or the Water Div.
f. After being contacted by Public Safety Dispatcher, staff has a maximum of forty five (45) minutes (weather permitting) to arrive or contact the emergency location.
g. If staff does not arrive at the Location within the allotted amount of time and no other arrangements have been made then disciplinary action can and will be taken.

If on-call staff is unsure how to respond to the Public Safety Dispatcher, s/he should contact their immediate supervisor.

STORM WATER – Permanent BMP inspection

Preparation

a. Identify all City owned and privately owned permanent BMPs in the City

b. Identify Responsible party for each BMP

c. Gather basic information such as types of BMP, Area of drainage, and Maintenance information/history

Process

a. Use the information for the specific site SWPPP review to make sure that post-construction BMPs are still current.

b. Survey the surface area for trash and debris, signs of spill or leaks and any other issues that could cause pollution or prevent the BMP from functioning properly

c. Inspect inlets such as boxes and curb cuts for blockage, signs of pollution, and functionality

d. If maintenance is required at a privately owned facility contact property owner

e. If property owner refuses to maintain the BMPs the City will proceed and take action

Clean Up

a. If any material needs to be removed from the site, place it in a dumpster with a lid or cover, and haul it to the land fill. (6030 West California Ave.)

Documentation

a. Use Utilisync to document all actions and findings

STORM WATER – Mapping

Preparation

a. Review existing maps and GIS data to determine items to be mapped and locations/pathways of municipalities.

b. Communicate with GIS Technician to determine mapping software and the edit ability of GIS data and permissions.

Process

a. Locate municipal asset/system in the field.

b. Properly categorize items to be mapped and assign distinguishable title/name within GIS software.

c. Record location using GPS and GIS software. Include date, as well as, relatable data specific to the item being mapped.

d. Communicate with GIS Technician to ensure proper data collection.

Documentation

a. Record data within GIS software and ensure item specific data is present.

b. Document any pertinent information needed to locate the item being mapped.

c. Record mapped sites in field notes.

VEHICLES – Fueling

Preparation

a. Train employees on proper fueling methods and spill cleanup techniques.

b. Absorbent spill clean-up materials and spill kits shall be available on mobile fueling vehicles.

Process

a. Shut off the engine.

b. Ensure that the fuel is the proper type of fuel for the vehicle.

c. Nozzles used in vehicle and equipment fueling shall be equipped with an automatic shut off to prevent overfill.

d. Fuel vehicle carefully to minimize drips to the ground.

e. Fuel tanks shall not be 'topped off' to avoid overfilling (leave room for expansion).

f. When fueling small equipment from portable containers, fuel in an area away from storm drains and water bodies.

Clean Up

a. Immediately clean up spills using dry absorbent (e.g., kitty litter, sawdust, etc.) sweep up absorbent material and properly dispose of contaminated clean up materials in a solid waste dumpster. Ensure that the used absorbent contains no free liquid.

b. Large spills shall be contained as best as possible and the HazMat team shall be notified ASAP.

Records

a. Document training of employees.

VEHICLES – Vehicle and Equipment Storage

Preparation

a. Inspect parking areas for stains/leaks on a regular basis.

b. Provide drip pans or adsorbents for leaking vehicles.

c. Continue preventative maintenance program for vehicles and motorized equipment

Process

a. Whenever possible, store vehicles inside where floor drains have been connected to sanitary sewer system.

b. When inside storage is not available, Vehicles and equipment will be parked in approved designated areas.

c. Maintain vehicles to prevent leaks as much as possible.

d. Address any known leaks or drips as soon as possible. When a leak is detected a drip pan will be placed under the leaking vehicle to collect the drip.

e. The shop will provide a labeled location to empty and store drip pans.

f. If any leaks are discovered, a drip pan will be used to collect the fluids and your immediate supervisor shall be notified as soon as possible. Also the Fleet Dept. needs to be notified so repairs can be scheduled.

h. Never store leaking vehicles over a storm drain.

Clean Up

a. Any leaks that are spilled on the asphalt will be cleaned up with dry absorbent and disposed of in a solid waste dumpster

VEHICLES – Vehicle Maintenance and Repair Activities

Description: This section is to inform municipalities about the protection of storm drain system from vehicles or equipment that may leak or drip petroleum products and that may also collect large amounts of dirt.

Applicability: Storing and washing of vehicles and equipment.

Preparation

a. Make available spill management equipment

b. Store vehicles indoors where possible and in an area with no floor drains that lead to storm water system.
c. Inspect for leaking equipment and vehicles using the Daily Work Report checklist.

Process

a. Drip pans must be used to collect leaking fluids from equipment or vehicles while vehicles are waiting to be repaired.

b. Repair leaking vehicles as soon as possible to eliminate potential discharge to the storm drain system.

c. Wash vehicles and equipment in designated areas.(see Vehicle-Washing SOP)

d. Schedule and perform preventive maintenance on vehicles and equipment.

Clean-up

a. Properly clean any areas that have been affected by leaking vehicles using dry methods. Discard clean up materials in the solid waste dumpster.

b. Discharge all residual wash water containing contaminates (degreasers, acids, and oil bases) to the sanitary sewer if it meets treatment plant standards as determined by the Wastewater Dept.

c. Do not store or wash vehicles over or adjacent to storm drain inlets.

Documentation

a. Record any leaking vehicles or equipment on the Daily Work Report

VEHICLES – Washing

Preparation

a. Provide wash areas for all vehicles inside the Public Works garage/shop area that has a drain system which is attached to the sanitary sewer system.

b. No vehicle washing will be done where the drain system is connected to the storm sewer system.

Process

a. Minimize water and soap use when washing vehicles inside the shop building.

b. Use hoses with automatic shut off nozzles to minimize water usage.

c. Never wash vehicles over or a storm drain.

Clean Up

a. Sweep wash areas after every washing to prevent solids from washing down the drain system. Place solids in the trash receptacle.

b. Clean solids from the settling pits on an as needed basis. (see Catch Basin Cleaning SOP)

WATER – Unplanned Waterline Excavation Repair/Replacement

Preparation

a. Ensure that a valid Construction Dewatering Permit is in in good standing prior to work activity.

b. Make sure service trucks are ready for deployment supplied with wattles, gravel bags, dewatering bag, or other materials for inlet protection and sediment control.

Process

a. Slow and re-direct the discharge if possible.

b. Inspect flow path of discharged water and direct it appropriately away from storm water inlets

c. Meet the discharge limitations of the dewatering permit.

d. Protect water inlet areas by placing inlet protection devises around or up stream of inlet

e. Follow planned repair procedures.

f. Haul off spoils of excavation to Public Works bulk material/spoils yard

g. Use dewatering bags on pumps and check hourly for effectiveness

Clean-up

a. Remove any inlet protection and dewatering bags and discard appropriately in solid waste dumpster

b. Clean up the travel path of transported excavated material as well as all other material and deposit spoils in Public Works bulk material/spoils yard

c. Clean out any affected storm drain inlet boxes and pipe if needed and deposit spoils in Public Works bulk material/spoils yard.

d. With the removal of accumulated course soils use the street sweeper to finish cleaning impervious surfaces.

WATER – Transporting Dry Excavated Materials & Spoils

Preparation

a. Utilize truck with proper containment for materials hauled

b. Determine disposal site of excavated materials

c. Determine the path of travel to and from disposal site

Process

a. Load materials

b. Check truck after loading for possible spillage

c. Transport in manner to eliminate spillage & tracking using a bed cover.

d. Utilize one route for transporting materials

Clean-up

a. Clean loading area

b. Clean transporting route using a street sweeper.

c. Wash off truck and other equipment in a designated vehicle wash area(see Vehicle- washing SOP)

WATER – Transporting Wet Excavated Materials & Spoils

Preparation

a. Utilize truck with containment for material hauled

b. Determine disposal site of excavated material

c. Determine the path of travel to and from disposal site

Process

a. Load and Transport in manner to minimize spillage & tracking of material

b. Check truck for spillage

c. Utilize one route of transport for materials

Clean-up

a. Clean loading area affected and route of transport of any spilled material

b. Wash out equipment truck and other equipment in designated vehicle wash area(see Vehicle-washing SOP)

CONSTRUCTION – Public Works SWPPP Planning and Implementation

Description: This section contains information and guidelines for protecting and preparing a construction site with BMPs and a SWPPP.

Applicability: Protecting construction sites and surrounding runoff areas prior to construction.

Preparation

a. Create and maintain a SWPPP for any construction project that has a potential effect on water quality.

b. Conduct a pre-construction SWPPP review of site and planned operations.

c. Plan which BMPs to implement during construction to manage potential runoff from site.

d. Incorporate in the SWPPP a set of procedures that will protect potential water quality impacts.

e. Incorporate into the SWPPP opportunities for use of low impact design (LID) and green infrastructure when opportunities exist.

Process

a. Implement BMPs prior to the commencement of work activity. Adapt BMPs to changing work conditions.

b. Implement LID features that are planned.

c. Periodically inspect BMP and make corrections as necessary.

Clean-up

a. Following the completion of work activity remove BMPs, stabilize disturbed areas, remove all spoils material to the Public Works spoils pile and sweep impervious surfaces that are impacted.

Documentation

a. Record all construction sites that disturb 1 or more acres of land, or will disturb less than 1 acre of land but be part of a common plan of development or sale that will ultimately disturb 1 or more acres of land in Utilisync.

b. Keep any notes or comments of any problems for at least 5 years from date of record.

MUNICIPAL – Provide Storm Water Training to Employees

Description: This section informs municipalities to train employees who are likely to work/impact storm water quality.

Applicability: Training employees to protect storm water.

Preparation:

a. Assemble training materials and presentation

b. Provide a map of the storm drain system so that each employee can be aware of the network.

c. Determine which employees require formal training and the level of training in accordance with the MS4 permit

Process

a. Train employees on how to minimize pollutant run off from operated facilities into the storm water system by using proper procedures, engineering controls and BMPs.

b. Train employees who have primary construction, operation, or maintenance job roles about applicable standard operating procedures.

d. Review the inventory of operated facilities and associated storm water controls.

e. Provide follow-up training as needed to address applicable changes in the permit and procedures.

Clean-up

a.. None

Documentation

a. Keep record of those who have been trained

MUNICIPAL – Municipally-sponsored Events

Description: This Section referees to municipally-sponsored events such as large outdoor festivals, parades or street fairs.

Preparation

a. Provide regular observation of the area that the event will take place in.

b. Restrict parking in areas to be swept prior to the event using barriers as necessary.

c. Perform regular maintenance and services in accordance with the recommended vehicle maintenance schedule on sweepers to increase and maintain efficiency.

d. Based on the activity determine if BMPs are required to protect the storm water system.

Process

a. Sweep parking areas, as needed, or as directed by the city's responsible official.

b. Hand sweep sections of gutter if soil and debris accumulate.

c. Pick-up litter as required to keep parking and open space areas clean and orderly.

d. Ensure there is a sufficient amount of trash containers, and they are clearly marked for the proper type of material

e. Maintain BMPs that may be in place during the event.

Clean-up

a. Dispose of sweepings properly (See Street Sweeping SOP).

b. Street sweepers to be cleaned out in a manner as instructed by the manufacturer and in a location that swept materials cannot be introduced into a storm drain. (See Street Sweeping SOP)

c. Swept materials will not be stored in locations where storm water could transport fines into the storm drain system. (See Street Sweeping SOP)

d. Empty trash containers as needed and at the end of event.

e. Remove BMPs if utilized.

Documentation

a. Keep accurate logs to track trash and other debris.

MUNICIPAL - Hydro Excavation Dumping and Wash out Station

Description: This contains guidelines for the proper operation of wash out station, and debris.

Application: Proper disposal and containment of Hydro excavation debris

Preparation

a. Identify the container and/or proper location (dump truck, bulk waste trailer or dumpster) or area for dumping the excavation debris before washing out,
b. Be sure the debris container or area is not located near a storm drain.
c. Be sure that the equipment is placed on the asphalt on the north side of the wash station.
d. Inspect the station for obvious problems such as excess debris, flow obstructions and any other deficiencies with the station.

Process

a. Make sure that debris is being placed into the appropriate container or area in the yard.
b. Debris spillage is to be swept and shoveled into the designated container.
c. Ensure the proper placement of the equipment to be cleaned.
d. Only clean the debris body of the equipment and the immediate surrounding area.
e. While cleaning the debris body, make sure the wash water is not leaving the station.
f. When washing is complete move the equipment from the asphalt pad and wash the area where the equipment was parked.
g. After washing down asphalt pad remove any debris on the grate over the underground storage tank and place it in the container or appropriate area.

Clean up

a. If there is a lid or closer for the debris container be sure to close it to prevent wind or rain from causing a breach of the container.
b. Be sure to inspect the area around container and sweep/shovel any loose debris into the container.
c. Check to see how full the container is. If it is 75% full schedule with supervisor to have it emptied at the Landfill located at 6030 W California Ave.
d. Be sure to turn water off.
e. At the end of shift be sure to pump the tank using the pump that is designated (located in the public works garage) for the station, into the clean out location on the north side of grease trap (sanitary sewer).
f. Once the tank has been pumped down replace the clean out cap and ensure the station is clean before leaving the station.

Documentation

a. After the site is clean and tank has been pumped down document any deficiencies with the station or with the container.

MUNICIPAL – Semi-annual Priority Facility Inspections

Preparation

a. Prepare necessary equipment for spills, measurements, and documentation.

    i. An IPad, appropriate keys and gate code, manhole hook will be needed. All other tools and equipment are located on site.

Process

a. Visually assess Public Works location for any outstanding concerns or signs of storm water runoff.

b. Consult UtiliSync form "Quarterly Comprehensive Inspection" and evaluate the status of each subject area listed.

    i. Walk the perimeter and interior of the property while carrying out inspections.

c. Add detailed notes about any aspect of the inspection requiring more attention or action.

d. Carry out any maintenance or corrective action required as a result of the inspection.

BMP's and Activity Areas

a. Generator area (central section of property on the southwest side of the main building)

    i. Ensure proper storage, and use of fuel within Shop Building

b. Equipment Shop/Wash Station

    i. Ensure proper use, storage and disposal of chemicals and wastewater to sanitary sewer or landfill (household hazardous waste).

    ii. Ensure cleaning of wash area including drain grates.

    iii. Inspect spill kits located on both the north and south ends of shop, for inventory needs

c. Drain box (center of the property on the south side of the main building Utilisync ID 1634)

    i. Evaluate for spills, and clean grate and box as needed dispose of debris in covered garbage bin.

d. Storage and Stock Building (South side of property)

    i. Ensure material stored is being kept within the covered building. Ensure that hazardous materials are stored within secondary containment.

ii. Ensure of proper maintenance of equipment, and vehicles. Check for leaks, tracking, and cleaning.

iii. Ensure green waste staging area is contained within berms and dividers and is being emptied as needed to the landfill.

e. Parking Lot

i. Ensure proper disposal of debris to covered garbage bin.

ii. Watch for tracking and spills of materials from equipment. Clean up if needed.

f. Recycling, Garbage, and Scrap Metal Bins (west side of property)

i. Ensure that waste and materials are fully contained.

ii. Ensure proper covering and maintenance of containers, and check for leaks or materials that don't belong.

g. Concrete Washout and Wash Pit (southwest corner of stock yard)

i. Ensure proper containment and disposal of concrete and washout within container, and the removal of material when the container is 75% full.

ii. Ensure proper disposal of waste water and materials from washout of the Vactor, Street Sweepers, Vac Trailer, and other large waste water containers to washout pit. Ensure waste water is being pumped to the sanitary sewer line adjacent, and that other materials are disposed of to the landfill.

h. Spoils Pile (center of stock yard)

i. Ensure that only material from excavation remains in the spoils pile and is removed every two weeks.

ii. Stock Piles (south east corner of stock yard)

i. Ensure stock material is contained within individual containment berms.

j. Auto Shops (East end of property)

i. Ensure proper disposal of chemicals, grease, oil, and other automotive byproducts through third party service.

ii. Ensure cleaning materials (degreasers and safe solvents) and other waste is removed to the covered garbage bin.

iii. Ensure proper functionality of Grease trap, and no obvious signs of over flows, (Located outside on the north east end of Shop)

iv. Generator Area (located outside on the North side of shop), Inspect for fuel spills or leaks.

v. Inspect spill kit located in both bay areas for inventory.

Documentation

a. Record all responses and notes in UtiliSync including date, time, and inspector information.

b. Use photographs to record any issues or areas of concern.

STORM DRAIN – Culvert and Storm Water Pipe Cleaning

Description: This section contains information on the cleaning of storm drain culverts and pipes. This also includes what methods to use to remove sediment and debris from the structure. A record keeping procedure is also outlined for tracking the cleaning process.

Applicability: Cleaning of Culverts and Pipes.

Preparation

a. Clean sediment and trash off inlet to culvert/storm water pipe.

b. If possible do visual inspection of inside of culvert/storm water pipe to look for cracks, missing or broken pieces in the walls/ sides of structure and determine if it needs to be cleaned.

c. Determine the area to be inspected and cleaned.

d. Determine the equipment needed to inspect and perform cleaning.

Process

a. Following the initial visual assessment, clean using a high powered vac truck or trailer, cleaning the sides of the structure and removing the sediment on the bottom.

b. If necessary, insert high powered rodder hose down culvert or pipe and pull back any sediment.

c. Clean inlets and outlets.

d. Move truck to next storm drain.

Clean-up

a. When vac truck is full of sediment take it to Central Valley Water Reclamation Facility to dump all the sediment out of the truck into a dry pond. An interim measure is to decant the liquids from the truck tank into the washout sump. Continue to decant after a series of fillings until the solids need to be removed.

b. When soil and debris are dry, remove with a backhoe and put it into a dump truck for transportation to the landfill.

Documentation

a. Keep logs of culverts/storm water pipes wells cleaned in Utilisync.

b. Record the amount of waste collected in Utilisync.

STORM DRAIN – Sumps and Injection Wells
(Includes Underground Storm Water Detention Structures)

Description: This section contains information on the cleaning of storm drain sumps and injection wells. This also includes what methods to use to remove sediment and debris from the structures. A record keeping procedure is also outlined for tracking the cleaning process.

Applicability: Cleaning of Sumps and Injection Wells.

Preparation

a. Clean sediment and trash off inlet to sump/injection well.

b. Determine how water is supposed to drain from the structure and assess the ability of the structure to allow water to drain as designed.

c. If possible do visual inspection of inside of sump/injection well.

d. Look for cracks, missing or broken pieces in the walls/sides of structure.

e. Do inside visual inspection to see what needs to be cleaned.

Process

a. Clean using a high powered vac truck, cleaning the sides of the structure and remove sediment on the bottom.

b. Remove fine sediments that might inhibit the drainage of water out the bottom or other drainage outlet(s).

c. Clean inlets and overflow outlets.

Clean-up

a. When vacuum truck is full of sediment take it to Central Valley Water Reclamation Facility to dump all the sediment out of the truck into a dry pond.

b. When soil and debris are dry, remove with a backhoe and put it into a dump truck for transportation to the landfill.

Documentation

a. Keep logs of sumps and injection wells cleaned in Utilisync.

b. Record the amount of waste collected in Utilisync.

STORM DRAIN - Swimming Pools and Spas Discharge to Storm Water System

Description: This section contains information and guidelines for the draining of swimming pools and spas into the storm drain or sanitary sewer systems.

Applicability: Pool and Spa draining into storm water or sanitary sewer systems.

Note: Pool owners may discharge their pool water and filter backwash water to the sanitary sewer. There are no limitations on chlorine content or pH levels for discharges to the sanitary sewer. It is also acceptable to discharge to the sanitary sewer if the water is cloudy discolored, or contains algae. The pool owner should contact Public Works prior to discharging water from any pool or spa regardless of where they plan to discharge the water - sanitary sewer, onto the ground, or in a manner such that it enters the storm water system. After approval has been given by the public works department, swimming pool water may be discharged into the sanitary sewer system or the storm water system. The city must ensure the sewer system can accommodate the additional swimming pool water discharge. There may be a fee associated with discharging pool or spa water into the sanitary sewer.

Preparation

a. With the help of Public Works officials determine the best place to discharge the water from the pool/spa.

b. A pool or spa may be emptied onto the ground or into the storm water system if the chlorine content is less than one part per million and free of other chemicals.

c. The pH level of the water must be tested prior to discharge and must fall within a range of 7 to 8.

d. The water must not be cloudy or discolored and must be free of algae or other contaminants.

e. Do a visual inspection of the pathway the water will take to ensure contaminants, trash, or soils or other sediments will not be washed into the storm water system. Clean as needed.

Process

a. Clean, as needed, any storm water structure that will be used to convey the water into and through the storm water system.

b. Drain the pool or spa to the location determined by Public Works officials using the pool system's pumps or by gravity.

c. Carefully watch the draining process at all times to ensure the water flow is going as planned and does not overload the system.

d. Water being discharged may not cause erosion and may not go unto a neighbor's property without their express written permission.

Documentation

a. Keep logs of pools and spas drained.

b. Record the amount of water drained and where the water was drained to.

c. Keep any notes or comments of any problems.

Steps to Evaluate Retrofitting Existing Infrastructure

1. Start with a map of the existing storm water system
2. Evaluate existing Post Construction BMPs for retrofitting opportunities
3. Overlay existing and future land use mapping
4. Look at sub-catchments/drainage areas – prioritize based on land use, impaired waters, and sensitive areas
5. Start with High priority areas
    a. Start at downstream end and look for property or opportunities to retrofit existing system for water quality
    b. Review list of possible post construction BMPs
    c. Work upstream to the upper ends of the high priority areas
    d. Compile a list of potential projects
    e. Create budgetary level costs for each project
    f. Prioritize projects
    g. Document findings – including reasons for prioritization
    h. Integrate this list with existing Storm Water Capital Improvement Projects
6. Repeat for Medium priority areas
7. Repeat for Low priority areas
8. Budget for and implement projects
9. Consider retrofit options with all redevelopment projects

Questions to ask when considering retrofits

1. Are there any highly impacted areas?
2. Why are these areas highly impacted?
3. Where are they?
4. How does the existing system work in this area?
5. What BMPs might address the problems?
6. Is there room to retrofit at the end of the line?
7. Would projects upstream maximize water quality and minimize impacts?
8. What are the anticipated costs?
9. How soon can this be programmed?
10. Do we have retrofitting requirements when redeveloping?

Use the following criteria to help rank developed sites for potential retrofits that will improve water quality.

1. Proximity to waterbody

2. Status of waterbody to improve impaired waterbodies and protect unimpaired waterbodies

3. Hydrologic condition of the receiving waterbody
4. Proximity to sensitive ecosystem or protected area
5. Any upcoming sites that could be further enhanced by retrofitting storm water controls

SSL Environmental Crimes Investigation

Incidents which may be pursued as criminal cases:

- Intentional contamination, esp. businesses/contractors (dumping, illegal connections)
- Major incidents (hazardous waste, bio-hazardous waste, large-areas of contamination)
- Stubborn violators or continued contamination (warned or civilly cited, refuses to clean up, fails to notify of spill)

General Procedure:

Discovery of Incident:

- Initial observer contacts city point of contact (POC) (Lt. Anderson) for determination of whether it appears that incident qualifies as criminal investigation
    - Cell: (801) 300-1805
    - If not likely a criminal investigation, then initial observer documents observations and POC refers case to appropriate department: Storm Water, Fire, ULD
    - Call SLVHD for sampling

Patrol officer involvement:

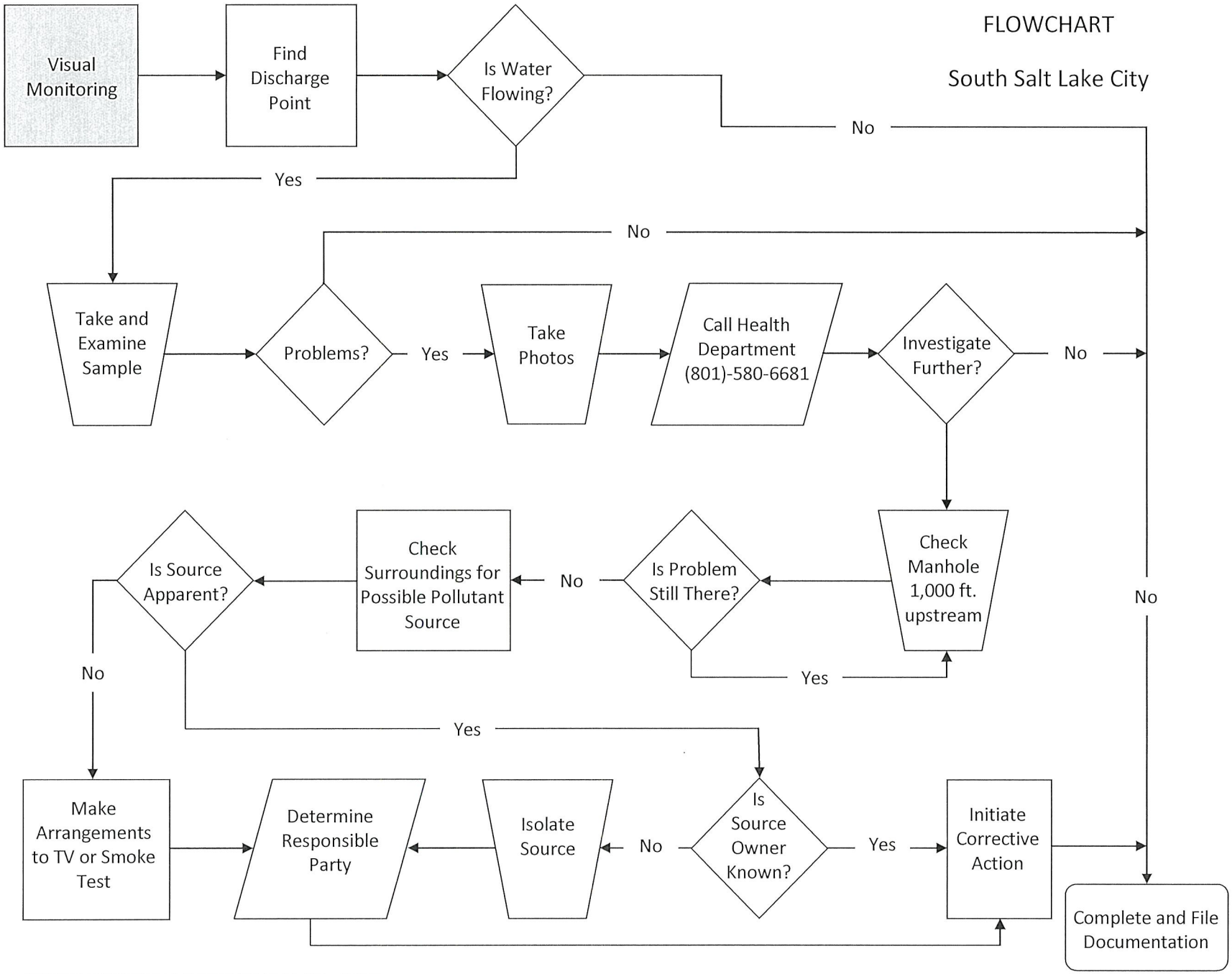
- If a criminal investigation, then patrol is dispatched & begins investigation – identify, interview & photograph
- All affected departments are notified
- POC notifies SLCoHD immediately for sampling (801) 580-6681
    - SLCoHD provides expert assistance – potential civil enforcement, if deemed appropriate after investigation
- Patrol ensures city/county departments arrive prior to releasing scene

Investigation:

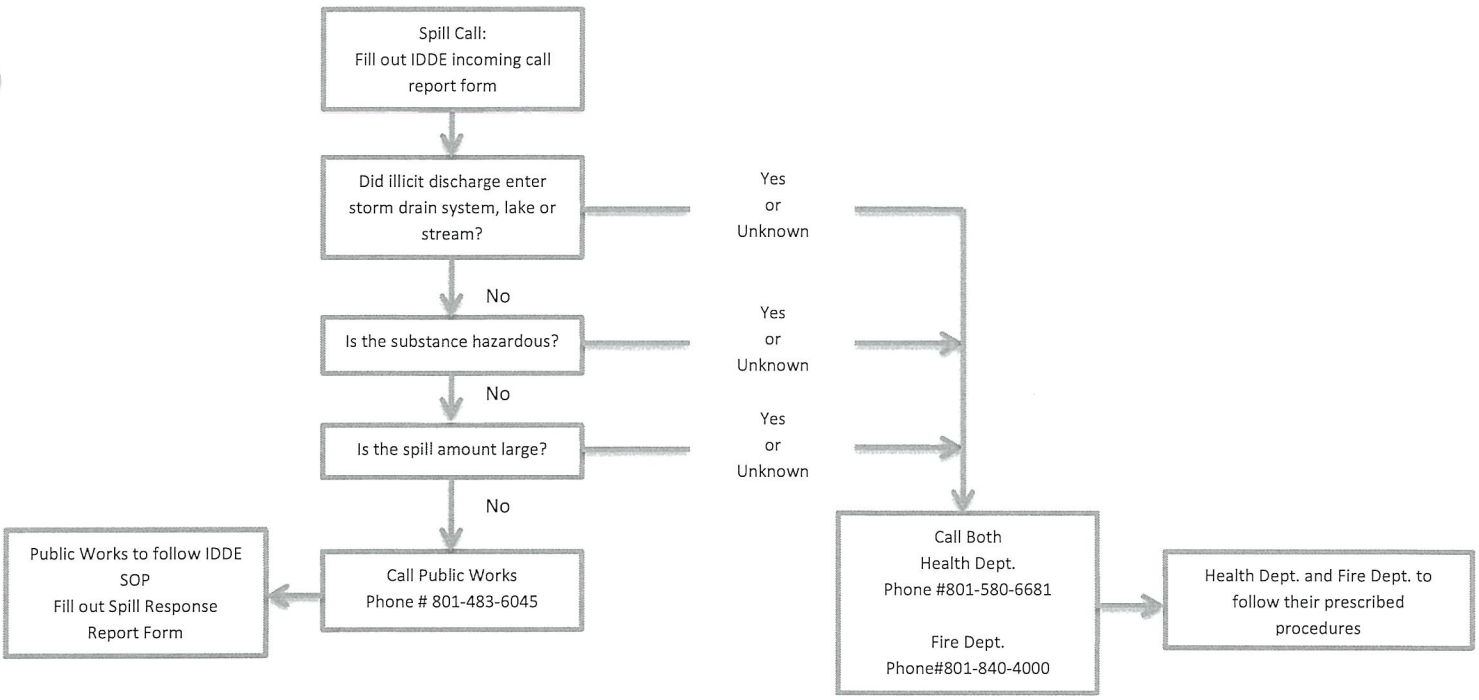
- Case referred to property detective for follow-up investigation
    - D.A. investigations to provide support or take lead, at city's discretion
- All reports, photos & evidence provided to property detective
- Det. Sgt forwards progress reports for review to Lt. Anderson.
- Cases to be screened with DA or City Prosecutor, as appropriate.
- Cases with insufficient evidence of criminal elements should be reviewed for N.O.V. or administrative citation.

DRY WEATHER SCREENING FLOWCHART

South Salt Lake City



INCIDENT RESPONSE FLOW CHART
South Salt Lake City



TRAINING LOG

Description of Training MS4 Construction overside inspection SOP

Date of Training	Trainee	Signature
6/24	S Dunn	
6/24	Micah Semon	
6/24	Elizabeth Barker	
6/24	Corby Talbot	

Name of Trainer_____

Signature_____ Date_____

Desired Outcome_____

SOUTH SALT LAKE PUBLIC WORKS

SOP Tracking Log

Name of SOP: Standard Operating Procedure for MS4 Construction OversightInspections of Permitted Construction Sites

SOP #: SW101

Description of SOP: This SOP was written for Utah MS4s to help them meet the requirements of their MS4 Permit and to provide guidance to abide by Utah State Code. This SOP references the Construction Site Storm Water Runoff Control section of the MS4 Permit. The overarching goal of this SOP is to standardize storm water construction program practices across all MS4s in the State of Utah.

Approved By: _____ Date: 6/23/25

Approved By: _____ Date: _____

Approved By: _____ Date: _____

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Approved By: _____ Date: _____

Approved By: _____ Date: _____

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Approved By: _____ Date: _____

Approved By: _____ Date: _____

Approved By: _____ Date: _____

Approved By: _____ Date: _____

Approved By: _____ Date: _____

Approved By: _____ Date: _____

Approved By: _____ Date: _____

Standard Operating Procedure for MS4 Construction Oversight Inspections of Permitted Construction Sites

Last Reviewed: May 07, 2025 Introduction

This SOP was written for Utah MS4s to help them meet the requirements of their MS4 Permit and to provide guidance to abide by Utah State Code. This SOP references the *Construction Site Storm Water Runoff Control* section of the MS4 Permit. The overarching goal of this SOP is to standardize storm water construction program practices across all MS4s in the State of Utah.

From **Utah Code 19-5-108.3:**
"The applicant shall allow construction site inspections by the authority. Except as provided in Subsection (12), the authority shall conduct an oversight inspection[1] through an electronic site inspection[2]."

"The authority may conduct an on-site inspection if the authority: has a documented reason for justifying an on-site oversight inspection."

To differentiate between the two types of oversight inspections, the terms "on-site oversight" and "electronic oversight" inspection are used.

- "On-site oversight inspection" is an inspection in which MS4 staff physically visit(s) a construction site to determine a site's compliance with construction storm water permits as has been done historically.
- "Electronic oversight inspection" is an offsite inspection in which MS4 conducts a review of the operator's submitted electronic site inspection to determine a site's compliance with construction storm water permits.

Each of these types of oversight inspections will be described in the *During Construction* portion within the *Process* section of this SOP.

1. Purpose:

The purpose of this SOP is to describe how all MS4s will conduct inspections for construction sites that require construction storm water permit coverage under the Construction General Permit (CGP) or Common Plan Permit (CPP). For purposes of this SOP, "operator" means the person responsible for the Storm Water Pollution Prevention Plan (SWPPP) implementation.

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[1] "Oversight inspection" means a construction site inspection performed by the authority to impose compliance with the permit. (Utah Code 19-5-108.3)

[2] "Electronic site inspection" means geo-located and time-stamped photographs the applicant takes, evaluates, and submits electronically to the authority. (Utah Code 19-5-108.3)

2. Responsibilities:

Each MS4's permit staff are responsible for implementing the requirements and may not differ from this SOP. The operator is responsible for abiding by all requirements of the UPDES CGP or CPP, and the MS4 is responsible for oversight.

- The position(s) responsible for oversight inspections is the Stormwater Division Manager and/or Stormwater Division Supervisor.
- The position(s) who has authority to implement enforcement procedures is Stormwater Technician, Stormwater Division Supervisor, Stormwater Division Manager, as well as the Division of Water Quality (DWQ).

This SOP is to be followed and updated according to State and municipal requirements.

3. MS4 Permit Requirements:

1. Oversight Inspection
    a. Required to be completed by the MS4 on any construction site that is greater than or equal to one acre or is part of a common plan of development or sale which collectively disturbs land greater than or equal to one acre.
    b. MS4 must inspect all phases of construction, including prior to land disturbance, during active construction, and following active construction.
    c. Oversight inspections are required to be completed monthly for non-priority construction sites and biweekly for priority construction sites.
2. Qualified Personnel
    a. The oversight inspection must be performed by a "qualified person" as described in the DWQ MS4 Permit.
    b. Anyone having a job duty related to implementing the construction storm water program must receive annual training. New hires must be trained within 60 days of hire.
3. Record Retention
    a. All MS4s must maintain records for at least five years of all applicable construction project documents which could include:
        i. Site plan reviews
        ii. SWPPPs
        iii. Inspections
        iv. Enforcement Actions (notices of violation, fines, stop work orders)

4. Process:

1. Pre-construction

    a. The MS4 will perform a pre-construction SWPPP review and meeting which at minimum will include:

        i. A review of the site design

        ii. Planned operations at the construction site

        iii. Planned Best Management Practice(s) (BMPs) during the construction phase

        iv. Planned long-term storm water run-off BMPs

        v. Documentation:

            1. SWPPP Review Checklist: Document the SWPPP Review Checklist through City Works.

            2. Pre-construction Meeting: Document the meeting in City Works.

    b. The MS4 will determine the frequency at which oversight inspections will be performed.

    c. The MS4 must provide the operator the procedure for notifying the MS4 of their completion of active construction.

    d. The MS4 will perform a pre-construction electronic oversight inspection or on-site oversight inspection with the operator(s).

        i. This pre-construction inspection must occur before land disturbance and will verify that the operator has placed all site specific construction BMPs prescribed by the SWPPP.

        ii. Documentation:

            1. Pre-construction inspection: Document the inspection through City Works.

    e. The operator should be notified of the option to opt-out of electronic site inspection requirements and signify that election to the MS4.

    f. The operator will submit a Notice of Intent (NOI) through the NeT NPDES eReporting Tool online (NeT) *before* earth disturbing activities.

2. During Construction

a. Electronic Oversight Inspection

    i. The MS4 will perform the required electronic oversight inspections through access to the operator's SWPPP, electronic site inspection(s), and operator's self inspection(s).

1. The operator's report must use geo-located and time-stamped photos of all BMPs implemented at the construction site.
2. All photos must be sufficient to depict that the BMP(s) is meeting its proper function to eliminate or control pollutants on site.
3. The operator's report should show compliance with the CGP or CPP if applicable, and the site specific SWPPP.

a. This includes all documentation regarding corrections taken as a result of the operator's self inspection.

b. On-site Oversight Inspection

i. An on-site oversight inspection may be conducted after the MS4 inspector has provided a 48-hours advance notice of an on-site inspection.
   1. Exceptions: If there is an imminent threat of discharge or the operator has formally opted-out of electronic site inspections.

ii. An on-site oversight inspection may be warranted under the following conditions:

1. Inadequate characterization in electronic site inspections of site conditions or portions of a site
2. Verified complaints
3. Failure to submit an electronic site inspection at the appropriate time
4. Alterations of electronic photographs
5. The construction site is within one-half mile of a river, a stream, or a lake
6. Compliance with the CGP, CPP if applicable, and site specific SWPPP cannot be reasonably determined during an electronic oversight inspection
7. A perceived or reported threat to water quality that is immediate[3] and/or imminent[4]
8. Failure to install BMPs prior to land disturbance
9. Illicit discharge, unknown/unidentified non-storm water discharge, or prohibited discharge per CGP/CPP permits

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[3] Immediate threat means contaminants are entering a river, a stream, or a lake.

[4] Imminent threat means contaminants are anticipated to be discharged into a river, a stream, or a lake within 48-hours.

10. The operator opts out of the electronic site inspection and instead elects an on-site inspection

11. Any other oversight inspection step listed below that cannot be fulfilled

c. An oversight inspection, both electronic and on-site, is performed by following these steps:

1. Review the SWPPP

2. Review the SWPPP signage for compliance with the CGP or CPP

    a. Placed in a safe, conspicuous, and publicly accessible location near the entrance

    b. Includes UPDES permit tracking number, contact information, and method of SWPPP access

3. Review the operator self SWPPP inspection reports

4. Review the entire perimeter and any downgradient areas

5. Review points of vehicle/equipment exit

6. Review any discharge points (keep in mind that these are not always piped inlets)

7. Review all BMPs installed to mitigate or prevent sediment, erosion, and pollution

8. Review all stabilizing areas (especially steep slopes)

9. Review all pollutant generating activities such as fueling areas, washout areas, etc.

10. Observe all discharges (if prohibited or unauthorized this is an immediate and/or imminent threat to water quality)

11. Observe all conditions that could result in polluted storm water discharge (including sediment in the street/gutter)

12. Determine if any additional sediment, erosion, and/or pollution prevention controls are needed

13. Verify that all above activities are accounted for and updated in the site's SWPPP and Map

14. Any deficiencies must be noted in the oversight inspection form

d. For oversight inspections, MS4 staff must use the *Oversight Construction Inspection Form* provided by the Division of Water Quality.

    i. MS4 staff sends a copy of the oversight inspection to the operator.

    ii. MS4 staff maintains record of all oversight inspections through Google Forms that are labeled as SWPPP Oversight Inspections (insert specific site name and permit number) or City works.

e. If the storm water BMPs on a construction site are found to be deficient by the MS4 inspector, steps will be taken to address the deficiencies as outlined in the *Enforcement for Construction Sites SOP*.

    i. Violations could include:

        1. Failure to maintain BMPs
        2. Failure to install BMPs
        3. An illicit discharge
        4. Failure to conduct inspections
        5. Failure to document corrections
        6. Failure to update SWPPP
        7. Any other CGP and/or CPP requirements that are deficient

3. After Construction

    a. The operator will request through NeT, a Notice of Termination (NOT) once these conditions have been met:

        i. Has the site achieved final stabilization?

        ii. Have all construction materials, waste and waste handling devices been removed?

        iii. Have all temporary storm water controls been removed?

        iv. Have all pollutants and pollutant-generating activities been removed?

        v. If landscaping will be completed by the homeowner, have temporary sediment and erosion controls been installed?

    b. MS4 staff who have 'MS4 Authority' will be notified of the request to approve the operator's NOT via an email notification from NeT.

    c. MS4 staff will verify through an electronic oversight inspection (or on-site oversight inspection if applicable described in the *Enforcement for Construction Sites SOP*) if all NOT requirements have been met and approve or deny the NOT submission via NeT.

d. MS4 staff will document the NOT inspection through the State's Storm Water NOT Inspection Form and maintain a record of it through City Works.

e. All documents related to each applicable construction site must be retained for five years or until construction is completed, whichever is longer.

***Note to the MS4:*
It is recommended that MS4s use this template to facilitate their construction storm water program requirements and should add specific information for each MS4 relevant to the program.

TRAINING LOG

Description of Training MS4 construction Enforcement SOP

Date of Training	Trainee	Signature
6/24	S DUNN	
6/24	Elizabeth Barker	
6/24	Micah Seman	
6/24	Corby Talbot	

Name of Trainer Micah Seman / Corby Talbot

Signature _____ Date 06/24/25

Desired Outcome Better understanding of enforcement process

SOUTH SALT LAKE PUBLIC WORKS

SOP Tracking Log

Name of SOP: Standard Operating Procedure for MS4 Construction OversightEnforcement for Construction Sites SOP

SOP #: SW102

Description of SOP: This SOP was written for Utah MS4s to help them meet the requirements of their MS4 Permit and to provide guidance to abide by Utah State Code. This SOP references the Construction Site Storm Water Runoff Control section of the MS4 Permit. The overarching goal of this SOP is to standardize storm water construction program practices across all MS4s in the State of Utah.

Approved By: _____ Date: 6/23/05

Approved By: _____ Date: _____

Approved By: _____ Date: _____

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Approved By: _____ Date: _____

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Approved By: _____ Date: _____

Approved By: _____ Date: _____

Approved By: _____ Date: _____

Approved By: _____ Date: _____

Standard Operating Procedure for MS4 Construction Oversight

Enforcement for Construction Sites SOP

Last Reviewed: May 13, 2025

Introduction

This SOP was written for Utah MS4s to help them meet the requirements of their MS4 Permit and to provide guidance to abide by Utah State Code. This SOP references the *Construction Site Storm Water Runoff Control* section of the MS4 Permit. The overarching goal of this SOP is to standardize storm water construction program practices across all MS4s in the State of Utah.

From **Utah Code 19-5-108.3:**
"The authority may conduct an on-site inspection if the authority has a documented reason for justifying an on-site oversight inspection." (Utah Code 19-5-108.3)

1. Purpose:

The purpose of this SOP is to describe how MS4s will implement standards from the MS4 Permit in conjunction with Utah State Code 19-5-108.3 in regard to sites that do not comply with their SWPPP and state issued Construction General Permit (CGP) or Common Plan Permit (CPP) if applicable. For purposes of this SOP, "operator" means the person responsible for SWPPP implementation.

2. MS4 Responsibilities:

Each MS4's permit staff are responsible for implementing the requirements and may not differ from this SOP. The operator is responsible for abiding by all requirements of the CGP or CPP and the MS4 is responsible for oversight.

- The position(s) responsible for oversight inspections is Stormwater Division Supervisor and/or, Stormwater Division Manager.
- The position(s) who has authority to implement enforcement procedures is Stormwater Technician, Stormwater Division Supervisor, Stormwater Division Manager, as well as the Division of Water Quality (DWQ).

This SOP is to be followed and updated according to State and municipal requirements.

3. MS4 Permit Requirements:

1. Enforcement procedures and regulatory authority must be written and documented in the SWMP of each MS4.
    a. The procedures of this SOP should be summarized or referenced in the MS4's SWMP which is accessible by the public. Regulatory authority is described in the *Inspections of Permitted Construction Sites SOP*.

2. Each MS4 permit staff with responsibility over the SWPPP program must be trained in proper documentation of inspections, follow-up, and enforcement actions.
    a. Documentation of routine maintenance, corrective actions, follow-up inspections, and enforcement actions should all be included with citations in the *Oversight Construction Inspection Form* provided by the DWQ.
        i. Any communication between the operator and the MS4 should be recorded and retained through City Works.
        ii. Verbal communication alone is not advised. If important communication does occur verbally (such as agreement on BMP improvement, corrective action deadline, etc) between the operator and the MS4, restating the conversation afterwards via email to the operator is advised so that a record can be retained.
        3. For construction sites that have been issued multiple escalating enforcement actions , the construction site could now be designated as a "priority construction site". Oversight inspection frequency would then increase to at least biweekly due to the past record of non-compliance by the operator and potential to threaten water quality.

4. Process:

1. Oversight Inspections
    a. If violations of the CGP/CPP are determined after conducting an inspection (electronic or on-site) as identified in the *Oversight Inspections SOP*, the MS4 must document each violation as part of completing the *Oversight Construction Inspection Form* provided by DWQ. *If the inspection was conducted on-site, justification for an on-site oversight inspection must be documented on the inspection form.*
2. Violation and Follow-up Procedures
    a. First Notice of Violation (Notice Of Violation 1)
        i. The MS4 must notify the operator of the violation(s) in writing as part of completing the *Oversight Construction Inspection Form*. The violation notation at minimum must include:
            1. Explanation/Identification of each violation
            2. Associated citation from the CGP/CPP 3.

        Deadline to correct each violation.
            a. The deadline to correct violations should be no sooner than one business day.

        ii. Reinspection
            1. The MS4 shall verify (i.e., reinspection photos, documentation) that each violation has been corrected as soon as is practicable after the deadline given by the MS4.
                a. If the follow up electronic inspection submitted by the operator

is not sufficient for MS4 staff to determine that the specific violation has been corrected, an on-site oversight inspection may be conducted to determine that each violation has been corrected. *If the inspection was conducted on-site, justification for an on-site oversight inspection must be documented on the inspection form.*

b. The MS4 should describe to the operator how and when verification of correction will be performed.

2. If the operator has not corrected the violation(s), the MS4 will notify the operator that the violation hasn't been corrected in writing as described in Notice Of Violation 2.
3. If the operator has corrected the violation(s), the operator will be notified by the MS4 that the project is in compliance.

b. Second Notice of Violation (Notice Of Violation 2)

i. The MS4 must notify the operator of the violation(s) in writing as part of completing the *Construction Oversight Inspection Form*. The violation notation at minimum must include:

1. Explanation/Identification of each remaining violation
2. Associated citation from the CGP/CPP
3. Written warning that fines can be issued if the violation is not corrected within the new time period specified by the MS4.
    a. The deadline to correct each violation should be no sooner than one business day.

ii. Reinspection

1. The MS4 shall verify (i.e., reinspection photos, documentation) that each violation has been corrected as soon as is practicable after the deadline within the time period given by the MS4.
    a. If the follow up is conducted as an electronic inspection submitted by the operator and is not sufficient for MS4 staff to determine that the violation has been corrected, an on-site oversight inspection may be conducted. *If the inspection was conducted on-site, justification for an on-site oversight inspection must be documented on the inspection form.*
    b. The MS4 should describe to the operator how and when verification of correction will be performed.
2. If the operator has not corrected the violation(s), the MS4 will notify the operator that the violation hasn't been corrected in writing as described in Notice Of Violation 3.
3. If the operator has corrected the violation(s), the operator will be notified by the MS4 that the project is in compliance.

c. Third Notice of Violation (Notice Of Violation 3)

i. The MS4 may issue a fine as outlined in Utah Code 19-5-108.3 until the MS4 performs an oversight inspection to verify that the violation has been corrected or the operator shows the violation has been corrected through photos or documentation.

d. Documentation:

i. The results of all enforcement notices, communications, and inspections including follow-up or reinspections, must be documented through City Works, or written violations.

3. Administrative Fines

a. If the operator does not correct the specific violation within the timeline set by the MS4 indicated in Notice Of Violation 2, the MS4 shall notify the operator in writing that the specific violation has not been corrected and **may** impose an administrative fine for each occurrence* as follows:

i. $500 per occurrence for working without an approved storm water permit;

ii. $300 per occurrence for tracking mud on road;

iii. $250 per occurrence for failure to clean up or report spills;

iv. $100 per occurrence for failure to conduct storm water inspections;

v. $100 per occurrence for failure to maintain storm water records; and

vi. $500 per site, per occurrence, for failure to use general best management practices, as determined by the authority;

** "each* occurrence" i.e. "per occurrence" *means that for each specific violation there is a separate fine associated with that violation each time that it occurs. For example, with two separate spills in different areas of the site, after the violation and follow up process has been exhausted for each spill, the MS4 could impose an administrative fine on the operator at $250 for each spill.*

b. The MS4 may impose the administrative fine:

i. for each business day the specific violation continues beginning on the day after the day on which the authority issues the administrative fine;

ii. and within 30 days after the day on which the applicant corrects the violation.

c. When the MS4 issues an administrative fine, the MS4 shall:

i. impose each fine in writing and clearly document the specific violation in the writing; and

ii. deposit collected fines into a restricted account for education and outreach under a program.

4. Special Cases

a. The MS4 may issue a stop work order if the MS4 has clear documentation of an immediate[1]threat to water quality.

b. The MS4 can correct a specific violation for the operator, and recoup the costs associated, if the operator refuses to correct the violation after the enforcement process and there is imminent threat[2] of significant harm to water quality or the stormwater system.

c. Except in cases of immediate threats to water quality the MS4 cannot issue a stop work order if the violation is a result of a properly installed and maintained BMP per specifications for the site conditions from the preferred BMP list.

5. Communication:

Each MS4 will utilize a method of communication for enforcement (such as a notice of violation, fines, stop work orders) to the operator.

[1] Immediate threat means contaminants are entering a river, a stream, or a lake.

[2] Imminent threat means contaminants are anticipated to be discharged into a river, a stream, or a lake within 48hours.

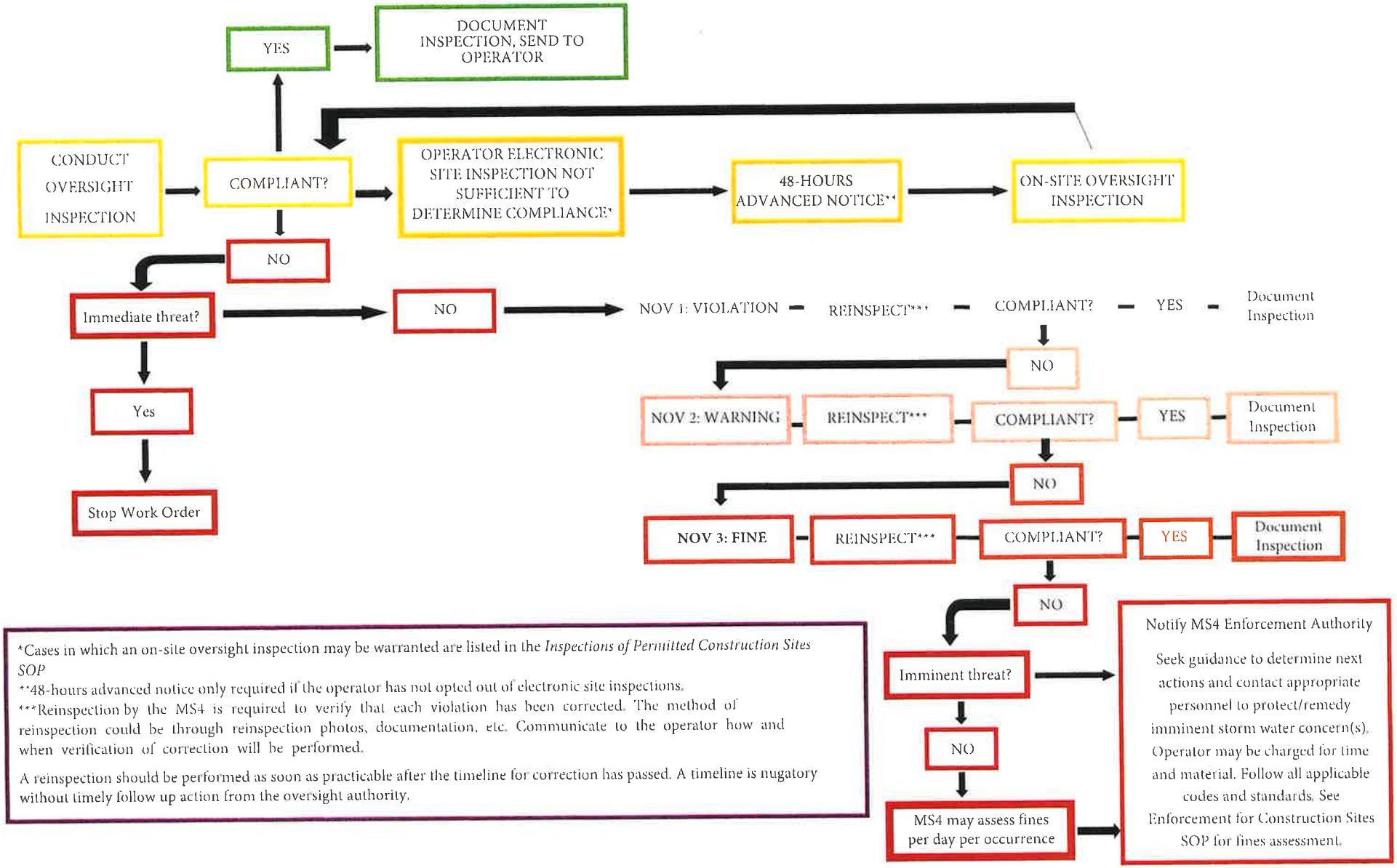
- The method used for this MS4 is as follows

1. Stated in the inspection form in city works that is emailed to the responsible people on site.
2. Verbally stated to the responsible person on-site
3. If Administrate fines, citations, stop work orders, or NOV's are issued it will be clearly stated in these forms as well

6. Flow Chart attached.

Enforcement for Construction Sites

Flow Chart



*Cases in which an on-site oversight inspection may be warranted are listed in the *Inspections of Permitted Construction Sites SOP*

**48-hours advanced notice only required if the operator has not opted out of electronic site inspections.

***Reinspection by the MS4 is required to verify that each violation has been corrected. The method of reinspection could be through reinspection photos, documentation, etc. Communicate to the operator how and when verification of correction will be performed.

A reinspection should be performed as soon as practicable after the timeline for correction has passed. A timeline is nugatory without timely follow up action from the oversight authority.