NPDES
Storm Water Associated With Construction Activities

Presented by:
Department of Health Clean Water Branch
Outline:

I. Overview of the NPDES Program

II. Clean Water - Compliance

III. Examples of Ineffective/Effective Erosion Control

IV. Our Goal / Resources
I. Overview of the NPDES Program
Overview of NPDES Program

Storm Water Associated With Construction Activities

- NPDES (National Pollutant Discharge Elimination System) Program
  - Clean Water Act (CWA)
    - CWA, Section 301(a) – No discharge to waters of the U.S. without a permit
    - CWA, Section 402 – establishes the NPDES program
  - EPA has delegated permitting authority to the Department of Health, Clean Water Branch.
Overview of NPDES Program

NPDES Federal Regulation
- Code of Federal Regulations, Title 40, Protection of Environment (40 CFR)

NPDES State Statutes and Rules
- Hawaii Revised Statutes, Chapter 342D - Water Pollution
- Hawaii Administrative Rules (HAR), Chapter 11-55 - Water Pollution Control
- HAR, Chapter 11-54 - Water Quality Standards
Overview of NPDES Program

Storm Water Associated With Construction Activities

NPDES (National Pollutant Discharge Elimination System) Program

- Purpose of the NPDES program is to protect human health and the environment
Overview of NPDES Program

Who Needs an NPDES Permit?

- NPDES permits are needed for discharges of wastewaters from new, old, or modified **point sources** from municipal, industrial and federal facilities.

- NPDES permits are also needed for storm water discharges from certain municipal and industrial facilities and construction activities.
Who Needs an NPDES Storm Water Permit?

- Coverage under an NPDES storm water permit is required for construction activities, including clearing, grading and excavation, that result in the disturbance of one (1) or more acres of total land area.

Note: The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale.
“We don’t have any storm water discharges…”
Overview of NPDES Program
Storm Water Associated With Construction Activities

➤ What is storm water?


  Storm water - means storm water runoff, snow melt runoff, and surface runoff and drainage.

- Includes only discharges which result from precipitation
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Storm water runoff

- 1-inch of rain over 1 acre of land yields approx. 3600 cubic feet or 27,000 gallons of water.

- **Example:**
  Location: Hanalei, Kauai
  A rain storm event from a 10 year, 24-hr storm (14 in.) on a 20 acre site would yield approximately 7.5 million gallons of water.

A portion of this rainfall will be absorbed into the ground, depending on soil permeability.
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➤ Why Do We Care About Storm Water Runoff?

“When it rains, it drains…”

- Impacts caused by **quantity** of runoff
  - stream hydrology changes
  - geomorphological impacts

- Impacts caused by **quality** of runoff
Overview of NPDES Program

Storm Water Associated With Construction Activities

➤ Why Do We Care About Storm Water Runoff?

- Polluted storm water runoff is the leading cause of impairment to nearly 40% of US water bodies that do not meet Water Quality Standards.

- In Hawaii:
  - 102 of 1052 coastline miles and
  - 2704 of 3904 total assessed stream miles do not meet State Water Quality Standards.
Overview of NPDES Program

Storm Water Associated With Construction Activities

(Why Do We Care About Storm Water Runoff? cont’d…)

- Typical Pollutants found in Industrial and Urban Storm Water
  - sediments / suspended solids
  - nutrients (nitrogen & phosphorus)
  - metals (copper, zinc, lead, cadmium)
  - pesticides / herbicides
  - oil and grease (PAHs)
  - high/low temperatures
  - toxic chemicals
  - bacteria
Effects of Polluted Storm Water Runoff from Construction Activities...
II. Clean Water - Compliance
Clean Water - Compliance

1. Legal Duty: Don’t put anything in State waters without permission

- Hawaii Revised Statutes (HRS) § 342D-50(a):

“No person, including any public body, shall discharge any water pollutant into state waters, or cause or allow any water pollutant to enter state waters, except as in compliance with the provisions of this chapter, rules adopted pursuant to this chapter, or a permit or variance issued by the Director.”
Definitions

- **Person** – includes everyone.
  (e.g., human, partnership, corp., trust, government agencies [incl. counties, U.S.])

- **Water Pollutant** – means anything except pure water
  (e.g., silt, oil, litter);

HRS § 342D-1 defines “Water Pollutant” as:

“Dredged spoil, solid refuse, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical waste, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, soil, sediment, cellar dirt and industrial, municipal, and agricultural waste.”
State Waters – means all waters, fresh, brackish, or salt, around and within the State, including but not limited to, coastal waters, streams, rivers, drainage ditches, ponds, reservoirs, canals, ground waters, and lakes; provided that drainage ditches, ponds, and reservoirs required as part of a water pollution control system are excluded.
2. **Legal Duty:** Don’t violate DOH rules or permits.

- **HRS § 342D-50(d):** No person, including any public body, shall violate any rule adopted pursuant to this chapter or any permit or variance issued or modified pursuant to this chapter.
3. **Legal Duty: Don’t harm water quality.**

  - Includes **narrative** (subjective) and **numerical** (objective) standards.
  - Both types are enforceable.
  - Subjective standards can be enforced without water samples in many cases.
Basic water quality criteria is applicable to all waters. Narrative standards include some of the following:

HAR §11-54-04(a):

All waters shall be free of substances attributable to domestic, industrial, or other controllable sources of pollutants, including:

(1) Materials that will settle to form objectionable sludge or bottom deposits
Clean Water - Compliance

3. Legal Duty (continued)

(2) *Floating debris, oil, grease, scum or other floating materials*;

(3) *Substances in amounts sufficient to produce taste in the water or detectable off-flavor in the flesh of fish, or in amounts sufficient to produce objectionable color, turbidity, or other conditions in the receiving waters.*

(4) *High or low temperatures; biocides; pathogenic organisms; toxic, radio active, corrosive or other deleterious substances at levels or in*
Clean Water - Compliance

3. Legal Duty (continued)

(4) (continued…)

combinations sufficient to be toxic or harmful to human, animal, plant, or aquatic life, or in amounts sufficient to interfere with any beneficial use of the water.

(5) Substances or conditions or combinations thereof in concentrations which produce undesirable aquatic life;
3. Legal Duty (continued)

(6) Soil particles resulting from erosion on land involved in earthwork, such as the construction of public works; highways, subdivisions, recreational, commercial, or industrial developments; or the cultivation and management of agricultural lands. [emphasis added]
Clean Water - Compliance

4. Legal Duty. No “illicit discharges” to storm water systems.

- Definition of “illicit discharge” - 40 Code of Federal Regulations (CFR) §122.26(b)(2)

- There should be no non-storm water discharges into State waters except for NPDES permitted discharges and *certain non-storm water discharges* provided that the discharges are not a source of pollutants [40 Code of Federal Regulations (CFR) 122.26(d)(2)(iv)(B)(1)].

  (e.g. fire hydrant testing water, air condition condensation; spring water; residential car washing; lawn watering; street wash water...
5. Consequences of Non-Compliance

- Warning Letter - Notice of Apparent Violation (NAV) or Notice of Potential Violation (NPV) letter

- Administrative / Civil Penalties - Notice and Finding of Violation and Order (NFVO)
  - monetary penalties up to $25,000 per day per violation.

- Criminal Enforcement
  - monetary penalties up to $50,000 per day per violation and jail time possible
“... Wal-Mart has agreed to pay $3.1 million civil penalty and reduce storm water runoff at its sites by instituting better control measures.”

"Runoff from construction sites is a primary contributor to the impairment of water quality in the nation. EPA is vigorously enforcing federal regulations..."
III. Examples of EFFECTIVE & INEFFECTIVE Erosion Control and Best Management Practices
What contributes to erosion?
Factors influencing erosion. Heavy rainfall, steep slopes, removal of most existing vegetation, and erodible soils result in higher soil losses from erosion.
Lower rainfall amounts, flatter slopes, preserving existing vegetation, and less erodible soils result in lower soil losses from erosion.
Pre-Construction Planning
Limiting the amount of bare soil exposed to the weather by working in phases reduces erosion and sediment control expenses.
Preserving existing vegetation at the site makes the final development more attractive and saves money by reducing clearing, excavation, and erosion control expenses.
Phase your construction work to minimize exposed soil areas
Identify drainage areas and drainage ditches and channels. Install diversions, grassed channels, sediment traps/basins, downslope sediment barriers, and rock construction entrance before beginning work.
Install construction entrances and control dust
Construction entrance detail. Entrance/exit pad must keep mud from tracking onto paved roads.
Rock pad was installed properly with right sized rock, but lack of filter fabric underliner is causing rock to spread and sink into the soil. Note tracking of mud onto paved road. Mud tracked on roadways violates BMP standards
Rock sizing, placement, and pad sizing are good, but sediment from unprotected slopes and ditches is washing onto paved highway.
Poor construction entrance. Rock pad is poorly constructed; rock is too small. Use filter fabric under rock and larger sized rock, such as #2. No mud should be tracked onto paved roads open for traffic.
Rock sizing and placement look OK for a residential site, and very little mud appears on the pavement. The pad is a little thin, however, and it looks like some drivers are not using it—note track marks near curb.

Entire area needs seed and mulch.
Diverting Offsite Runoff
Around Exposed Soils
Berms and ditches diverting clean upland runoff around construction sites reduce erosion and sedimentation problems. Seed berms and ditches after construction.
Diversion ditches should be lined with grass at a minimum, and blankets if slopes exceed 10:1 (10%)
Vegetated buffers above or below your work site are always a plus. They trap sediment before it can wash into waterways, and prevent bank erosion.
Good construction, seeding, and stabilization of diversion berm. Note that diversion ditch is lined with grass on flatter part of slope, and with rock on steeper part.
Good installation of rocklined berm to divert rain runoff around residential construction site on steep slope near a river. Diversion ditches can be lined with grass if channel slopes are 20:1 or less, and with blankets or turf mats if they are steeper.
Protecting Bare Soils With Seed, Mulch, or Other Products
Erosion and sediment loss is virtually eliminated on seeded areas (left side). Rills and small gullies form quickly on unseeded slopes (right).
Good mix of sod, seed, and mulch at site of new community center.

Note that inlet should be protected by installing a rock or sandbag berm to pond water before it flows into the inlet.
Poor seed establishment on slope. Use erosion control blankets or turf reinforcement mats when slopes are steep (greater than 4:1) and soil quality is poor. Terracing or benching steep slopes also helps.
Poor management of bare soil areas on residential construction site. Temporary or permanent seed or mulch must be applied as soon as final grade is achieved.
Installing sod immediately after grading work is complete can reduce erosion and sediment loss to near zero.
Excellent soil coverage at stream bank stabilization project using hand scattered straw, jute matting, and erosion blanket.