INSEC PROGRAM

IRMCA
INDIANA READY MIXED CONCRETE ASSOCIATION

Indiana Safety and Environmental Committee

Wash Out Certification

TABLE OF CONTENTS

Introduction/ What are the Washout regulations and Why do we need them?

- Mixer trucks, concrete pumps trucks and concrete finishing tools must be washed at job sites.
- This is necessary to prevent road hazards and for equipment longevity.
- Must be done carefully due to it's potential impact on the environment.

What is NPDES Phase 2 ?

National **P**ollutant **D**ischarge **E**limination **S**ystem

- **Federal Regulation –NPDES Phase 2**

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- **State Regulation –Rule 13, Rule 5**

↓

- **Local Regulatory Mechanism - Ordinance**

PURPOSE OF THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

- It's the LAW!
  - Enforced by the federal EPA via Clean Water Act of 1988
  - Enforced by state and local administrations having jurisdiction
- The Stormwater Pollution Prevention Plan (SWPPP) is designed to eliminate pollution from leaving the construction site.
- To eliminate pollution of the U.S. waterways
- To ensure that all individuals understand the importance of Best Management Practices (BMPs) on construction sites.

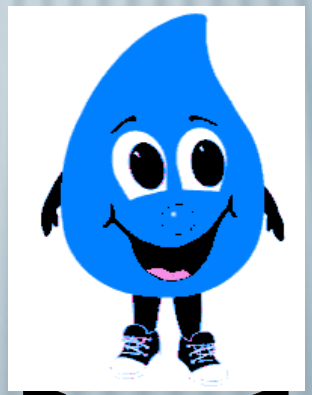
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (IDEM) STORMWATER RULES

- Rule 5 – Stormwater Discharge Associated with Construction Activity
- Rule 6 – Stormwater Discharge Associated with Industrial Activity
- Rule 13 – Municipal Separate Storm Sewer Systems

Federal

IDEM

State



MS4

Municipal

This is why it's so important!

Concrete Facts, Figures and Trivia

Facts and Figures

DID YOU KNOW?

- Only about 2.5 % of the world's water is fresh water. The rest is salt water. However, most of the fresh water is held in glaciers and polar icecaps or locked in deep aquifers, thus not available for human use. The result is that only about 0.25 % of the world's water, mostly in rivers, lakes and shallow aquifers, can be used to meet human needs.

Facts and Figures

Did you Know?

- If you get a rainstorm that dropped one inch of rain on your 1/2 acre lot with a house, you just received over 13,000 gallons of water!

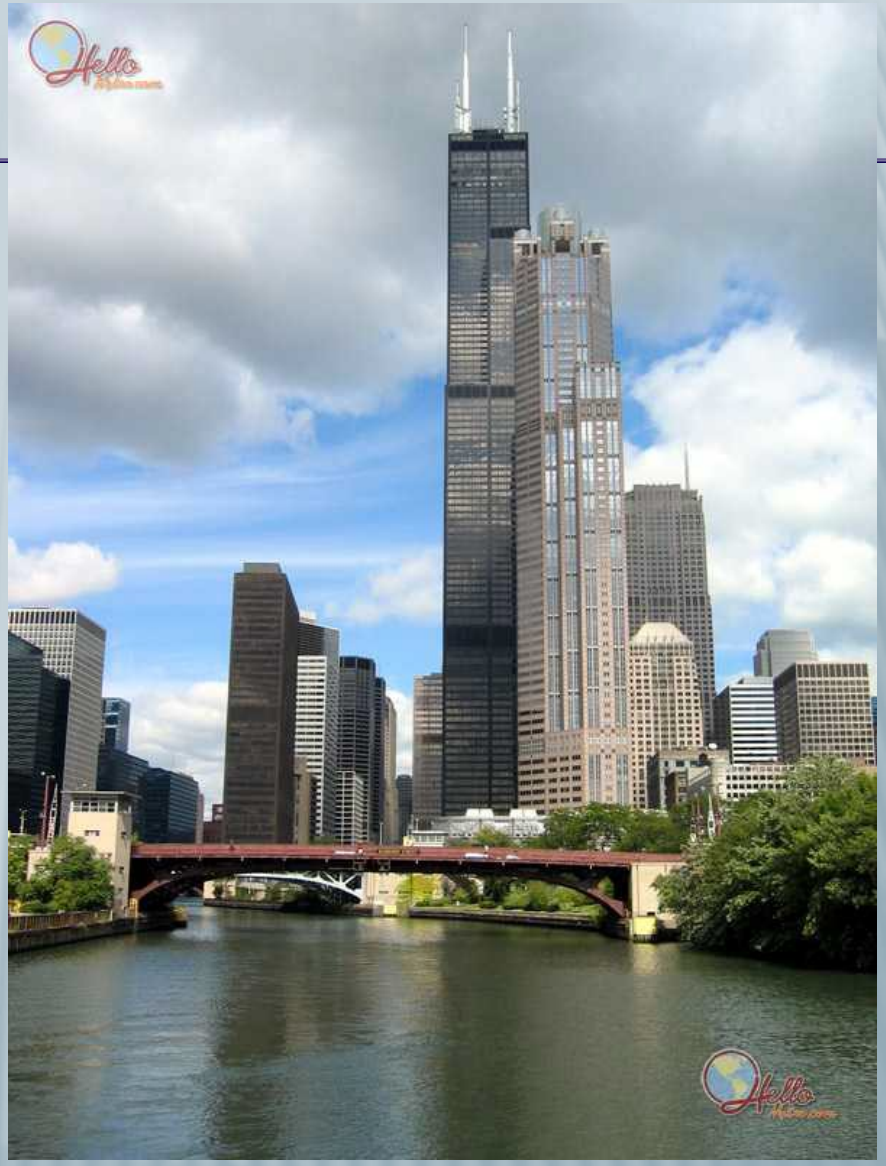
Facts and Figures

CONCRETE TRIVIA

The amount of concrete washout material and washwater generated each year accumulates to:

- 34 times more concrete than was used to build the Sears Tower in Chicago (2 million cubic feet/72,000 cubic yards), the worlds tallest building until 1996 or
- enough concrete to build an 8-lane freeway system 175 miles long or,
- nearly ¾ the amount of concrete used to construct the entire Hoover Dam
- Enough water to provide a city of 50,000 for nearly three months

- *All figures are approximate and for informational purposes only.



FACTS AND FIGURES

- Concrete's versatility, durability, and economy have made it the worlds most used construction material.
- The U.S. uses about 340 million cubic yards (260 million cubic meters) of ready-mixed concrete each year.
  - It is used in highways, streets, parking lots, parking garages, bridges, high-rise buildings, dams, homes, floors, decks, sidewalks, driveways, and numerous other applications. (http://www.cement.org/tech/)

Facts and Figures

Ready Mix

- 34 Million Truck Loads per year (10 cubic yards per truck)
- 2.16 Million Cubic Yards of concrete material left on chutes (1/16 yard left on chutes)
- 4.32 Million Tons of concrete material left on chutes (1 yard weighs 2 Tons)
- 240 Million Gallons of concrete washwater generated (7 gallons of water per truck chute)

Pump Truck

- 1.36 million Pumps per year (based on avg. 250 yard pour)
- 68 million Gallons of concrete washwater generated (50 gallons of water per pump)
- 340,000 Cubic Yards of concrete material left in pump hoppers (1/4 yard per pump)
- 680,000 Tons of concrete material left in pump hoppers (1/4 yard per pump)

- **TOTALS**

308 MILLION GALLONS OF WASHWATER GENERATED FROM TRUCK AND PUMP WASHOUT
2.5 MILLION CUBIC YARDS OF CONCRETE WASHOUT MATERIAL
5 MILLION TONS OF CONCRETE WASHOUT MATERIAL

THESE TOTALS ARE WHY CONCRETE WASHOUT PRACTICES ARE IMPORTANT!

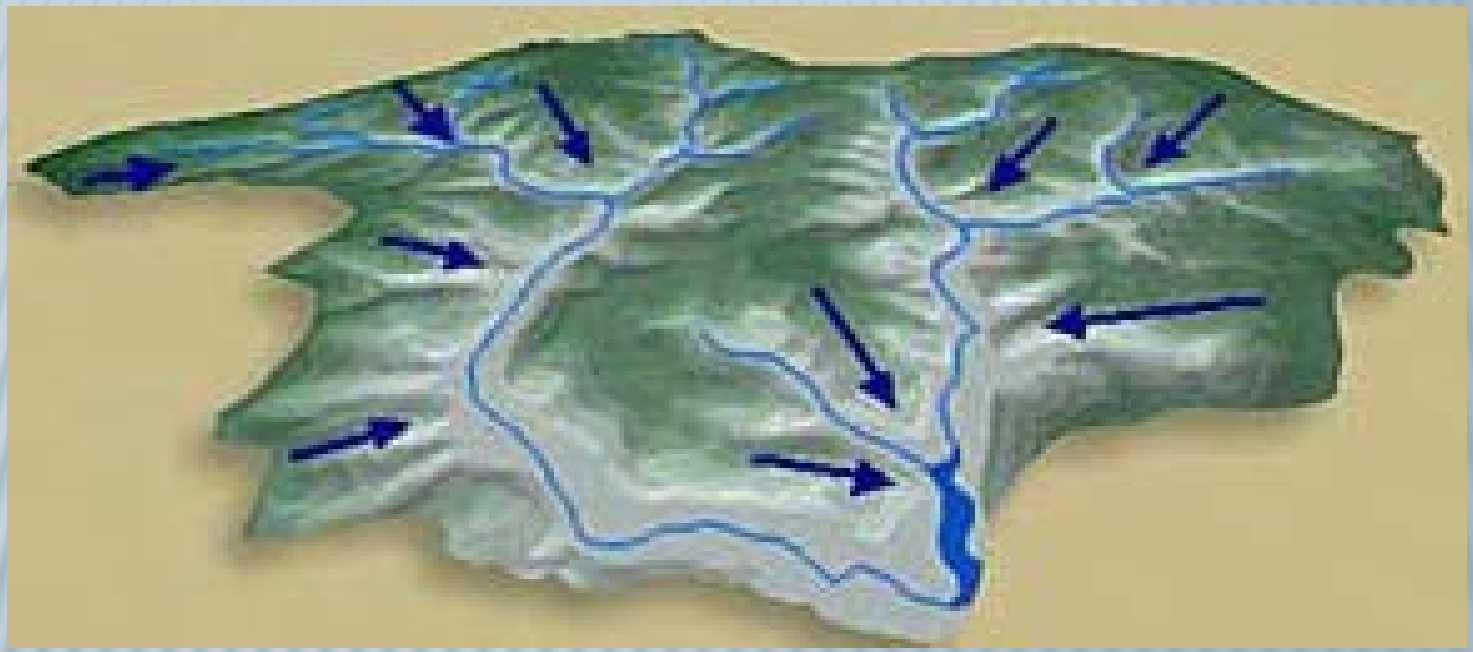
Definitions

WHAT IS STORMWATER?

- Runoff from natural precipitation, such as rain events, snow melt, and other surface runoff drainage

WATERSHED

The land that water flows across or under on its way to a receiving waterbody



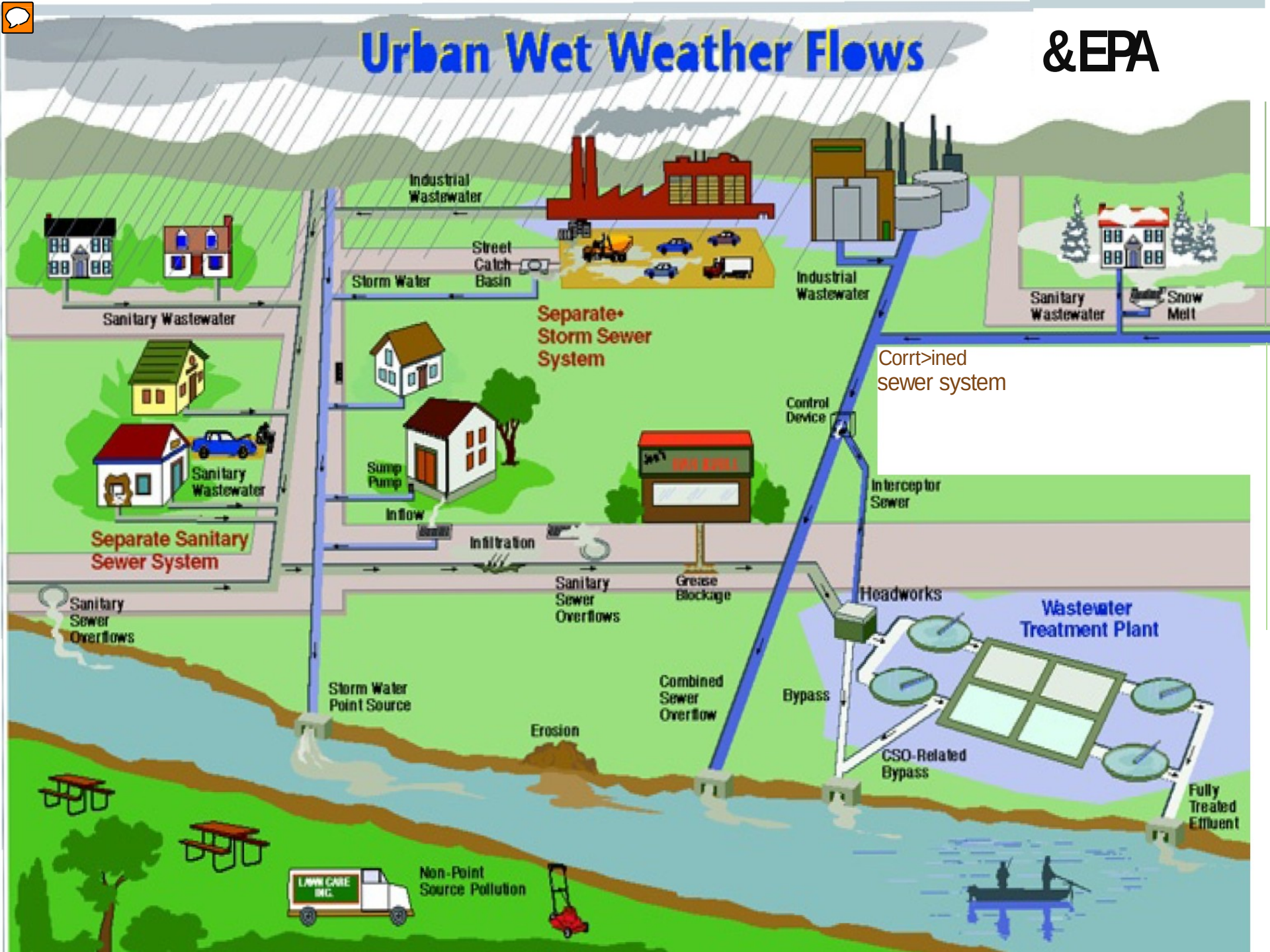
We ALL live in a WATERSHED, therefore our collective, individual activities impact stormwater quality

WHY IS STORMWATER AN ISSUE?

- EPA has identified stormwater as a leading source of water pollution to nearly 40% of surveyed water bodies in the US.

Pollutants

- Nutrients
- Sediment
- Pathogens
- Oils/ Grease
- Metals

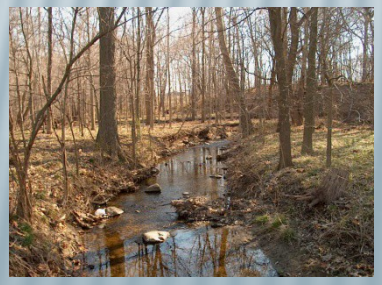

Urban Wet Weather Flows
&EPA
Industrial Wastewater
Street Catch Basin
Storm Water
Sanitary Wastewater
Separate Storm Sewer System
Industrial Wastewater
Sanitary Wastewater
Snow Melt
Corrt>ined sewer system
Control Device
Sump Pump
Inflow
Infiltration
Interceptor Sewer
Separate Sanitary Sewer System
Sanitary Wastewater
Sanitary Sewer Overflows
Sanitary Sewer Overflows
Grease Blockage
Headworks
Wastewater Treatment Plant
Storm Water Point Source
Erosion
Combined Sewer Overflow
Bypass
CSO-Related Bypass
Fully Treated Effluent
Non-Point Source Pollution

WHAT IS POLLUTION?

- “The action of polluting especially by environmental contamination with man-made waste”
- “The act of contaminating or polluting; including (either intentionally or accidentally) unwanted substances or factors”
- “undesirable state of natural environmental being contaminated with harmful substances as a consequence of human activities”

POTENTIAL SOURCES OF POLLUTANTS

- URBAN
  - Impervious Surfaces
  - Failing Septics
  - Development/ Sediment
  - Fertilizers/Pesticides
  - Pet Waste
  - Household Hazardous Waste
- RURAL
  - Tillage Practices
  - Erosion/Sediment
  - Failing Septics
  - Manure Mgmt
  - Lack of Riparian areas
  - Fertilizers/Pesticides

CONSTRUCTION SITE POLLUTION

- Waste or debris is generated by every person doing work on a construction site.
- If the waste or debris is not contained and disposed of properly, it becomes pollution.
- Good Housekeeping practices will reduce the potential for pollution.

WHAT IS EROSION?

- Erosion: is the process in which, by the action of wind or water, soil particles are displaced or transported

What are the types of erosion?

Splash: Raindrop impact, dispersal and mobilization of soil particles

Sheet: Saturated soils, soil particles entrained in run-off water, uniform removal

Rill: Increase topographic relief, higher run-off velocities, soil incision

Gully: Concentrated flow, head cutting, down cutting

Stream Bank: Natural drainage patterns, toe cutting, bank sloughing

WHAT IS SEDIMENT?

- Sediment: eroded material suspended in water or in the air. Sediment is the #1 pollutant of waterways.
- Sedimentation: the deposit of eroded materials
- When erosion occurs, small particles become suspended in water or air and sediment is transported down-stream or down wind.
- The purpose of stormwater pollution prevention is to minimize the opportunity for erosion to occur, thus minimizing the possibility of SEDIMENT leaving the jobsite.
- Most concentrated sedimentation comes form construction, which can exceed 100 times that from agriculture.

What is Sediment?

CONCRETE WASHWATER

Some of the contaminants contained within concrete washwater include; Aluminum, Barium, Chromium, Hexavalent Chromium (Chromium 6), Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Selenium, Sodium, Vanadium, and Zinc.

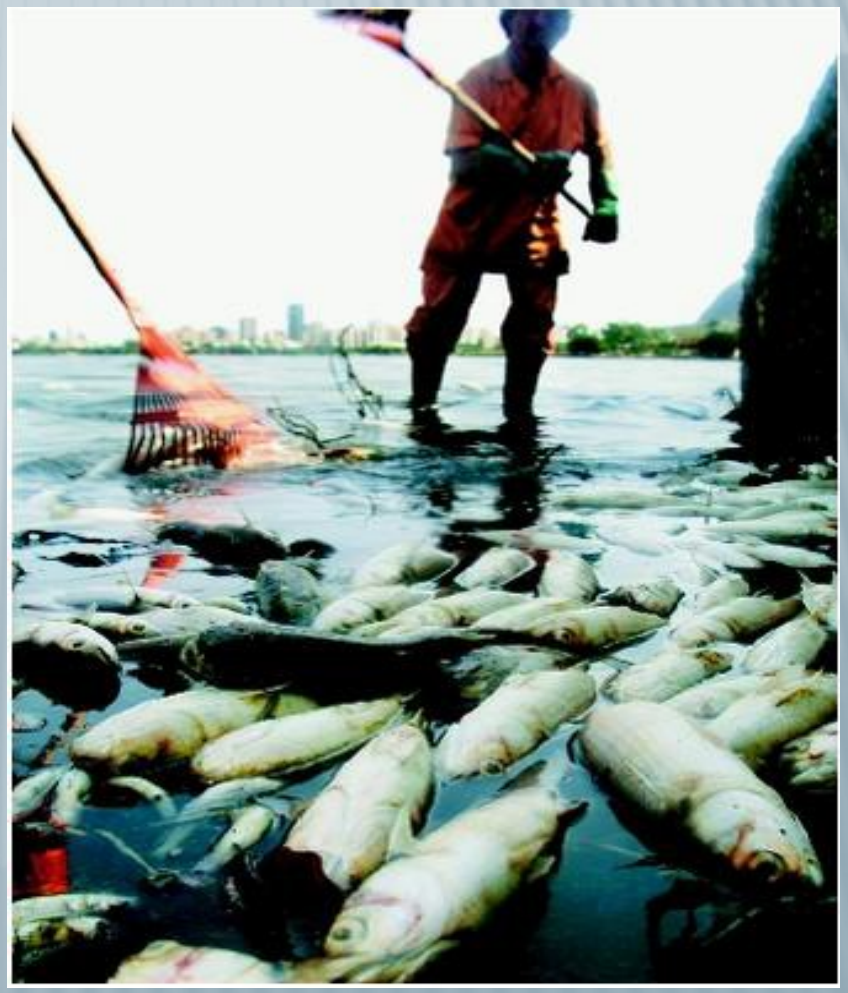
- The washwater may also contain trace elements of petroleum products, admixtures and other materials from processing or treating the material.
- Contact with wet (unhardened) concrete, mortar, cement or other cementitious materials can cause skin irritation and severe chemical burns or serious eye damage.

What is Sediment?

EFFECTS OF HIGH PH ON AQUATIC LIFE

- The effects of high pH on fish may include: DEATH; damage to outer surfaces like gills, eyes, and skin; and an inability to dispose of metabolic wastes.
- High pH may also increase the toxicity of other substances.

  -For example, the toxicity of ammonia is ten times more severe at a pH of 8 than it is at pH 7.
- The safe range for aquatic life is between 6.5 – 9.0 pH units.
- The average pH of concrete washout water is near 12 pH units.



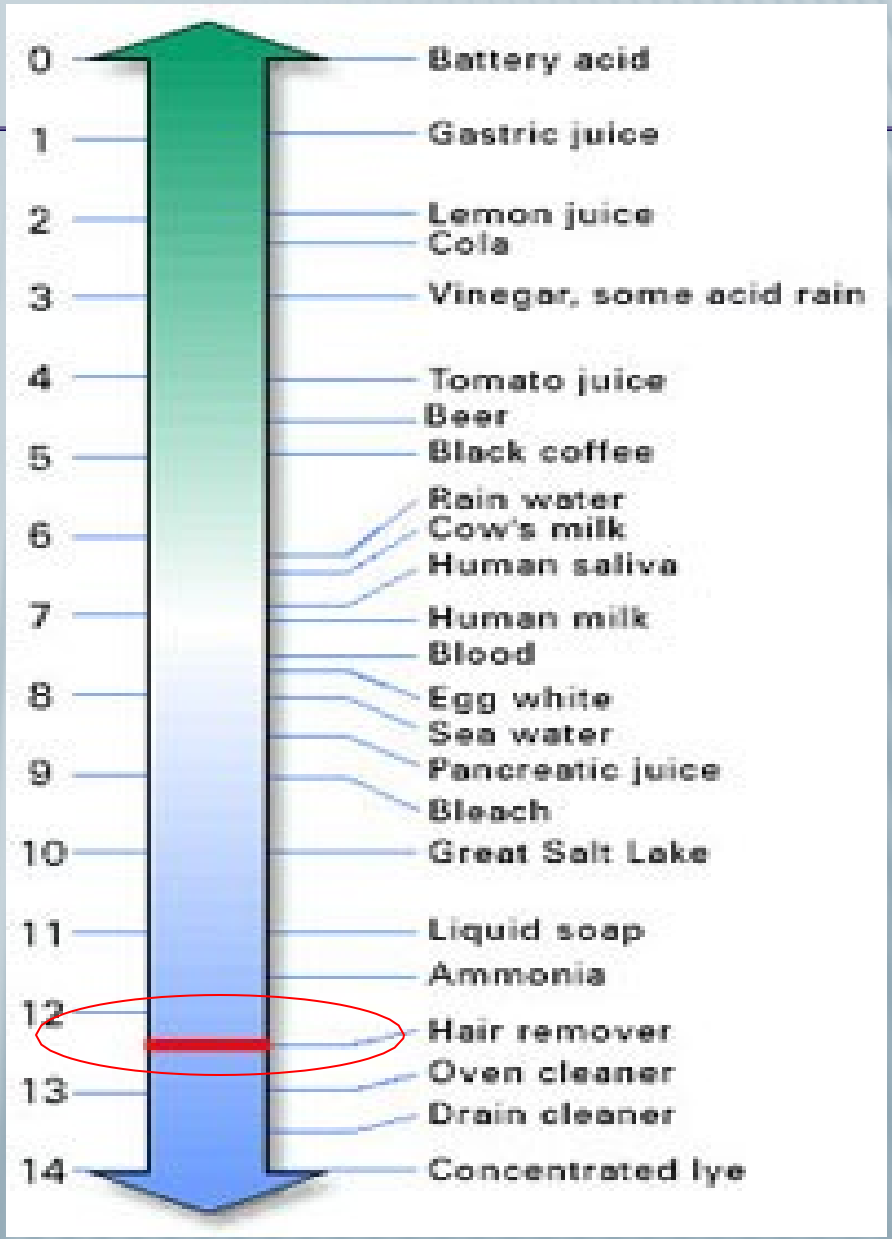
What is Sediment?

EFFECTS OF HIGH PH ON VEGETATION

- The effects of high pH on vegetation may include: inhibited growth, damage to soil and plants and substantial alteration of the soil and plant chemical composition even after the pollution source is gone.
- High pH may also increase the toxicity of other substances causing further problems.
- The safe range for plant life is between 6.5 – 7.0 pH units.

CONCRETE & PH

- WHAT IS PH?
- pH is a measure of how acidic or alkaline a substance is. The pH scale goes from 0 to 14, where 7 is neutral.
- A low pH value means the sample is acidic, while a high pH value means that the sample is basic or alkaline.
- A change in one pH unit means a tenfold change in concentration, similar to the Richter scale and measuring earthquakes.



THE INFLUENCE OF PH ON STORMWATER

- pH is important to aquatic life and water quality
- It is the measurement of the acidity or alkalinity

$$pH = - \log [H+]$$

- Has influence over both water quality and water chemistry

CONCRETE AND PH

- Adding or creating additional hydroxyl ions.
- Typically cement or concrete will make water more alkaline which is toxic to fish and other aquatic organisms.
- Impacts aquatic species respiration and photosynthesis in plants.
- Concrete contains sediment that coats the streambed and destroys habitat.

Industry Problems

INDUSTRY PROBLEMS

- Construction sites have long been identified as a large contributor to urban runoff pollution if the proper pollution prevention practices are not regularly performed.
- Materials washed into the storm drain have a direct impact on local waterways and habitat living in that environment.

INDUSTRY PROBLEMS

- The most common discharge into our storm drains from concrete construction is the residue and contaminants from washing down equipment such as concrete trucks, pumps, mixers, chutes, hand tools and wheelbarrows.
  - It also comes from other cementitious type products such as grout, mortar and stucco.

INDUSTRY PROBLEMS

- The primary ingredient in ready mixed concrete is Portland Cement.
- Which consists of Portland Cement Clinker, Calcium Sulfate, Calcium and Magnesium Oxide, metals and trace elements of potassium and sodium sulfate compounds, chromium compounds and nickel compounds.

INDUSTRY PROBLEMS

- Due to this high potential for urban runoff pollution, the United States Environmental Protection Agency (US EPA) has stepped up their efforts to keep Storm Water Pollution Prevention Plans (SWPPP's) compliant to the National Pollution Discharge Elimination Systems (NPDES).

- All of these mandated criteria are part of the US Clean Water Act and mandates the utilization of Best Management Practices (BMP's) on construction sites. Potential discharges into the storm drain systems from concrete work has become a priority of the federal and state EPA, water quality control officials, regional and local inspectors as well as a strategic target of the advocacy and environmental groups.

Let’s Fix it!

BEST MANAGEMENT PRACTICES (BMPS)

- Stormwater BMPs are critical to successful implementation of MCMs
- Def: any structural or nonstructural control measure utilized to improve the quality and reduce quantity of stormwater runoff"

Best Management Practices (BMP)

CONSTRUCTION ENTRANCE

Examples

Bad

Good

Let’s Fix It - Washout Locations

JOBSITE WASHOUT LOCATIONS

- The most important factor when washing out your vehicle or tools at the jobsite is the location!
- When you first arrive at the job-site, find out where the concrete is located.
- An acceptable washout location will have the following.

REQUIRED POSTING AT JOBSITES

- Most construction sites will have designated a specific washout site.
- If you are not familiar with a site or do not see any sign, ask a supervisor to point out the washout location.
- When you washout there, make sure to position your vehicle or tools so that your washout waters fall onto the washout area

JOB-SITE CONCRETE WASH OUT LOCATIONS

- The washout location must be accessible by truck
- The washout location cannot drain into storm sewers
- The washout location cannot impact the future use of land.
- The washout location cannot be located on slopes or hills where water can drain into a body of water.
- The washout location cannot be located in areas where snowmelt or heavy rain will drain into a body of water.

JOB-SITE CONCRETE WASH OUT LOCATIONS

- The washout location cannot drain into parks, open areas or pristine environment.
- The washout location cannot drain into waterways including lakes, rivers, stream, ponds or wetlands.
- The washout location must be located in areas where permission has been granted by the landowner.
- Never use acids or other solvents during washout procedures. Doing so violates federal law which is considered a crime.
- Never back flush the drum on any job-site under any circumstances.

JOB-SITE CONCRETE WASH OUT LOCATIONS

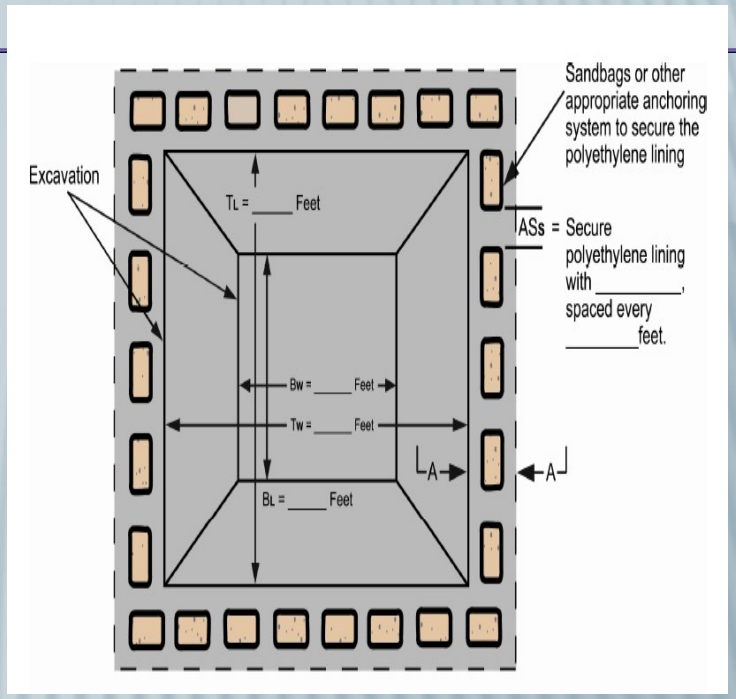
- Dump excess concrete in small piles and scrape all excess concrete out of the chutes.
- Use the minimum amount of water possible to reduce washout quantities and time.
- Wash the fins and the load hopper first when the drum is in the charge position.
- Wash the chutes last.

Construction Site Runoff Controls

- Develop, implement, manage, and enforce a stormwater runoff control program for construction activities
- Develop procedures for conducting plan reviews inspections, and enforcement
- Develop a mechanism for receiving and addressing specific public complaints or concerns

Construction Site Runoff Controls

CONCRETE WASHOUT



- Locate in regularly flat areas at least 50’ from any ditches, creeks, wetlands, inlets etc…
- Install clear signage to identify the location

LOCATION/PLACEMENT OF WASHOUT

- Do not place concrete washout facilities within 50 feet of storm drains, open ditches, or water bodies.
- Allow for convenient access for concrete trucks, preferably near the area where the concrete is being poured.
- Appropriate gravel or rock should cover paths to concrete washout facilities if the facilities are located on undeveloped property.
- On large sites with extensive concrete work, washouts should be placed in multiple locations for ease of use by concrete truck drivers.

JOB-SITE CONCRETE WASH OUT LOCATIONS

Scrape excess mud off the outside of tires and return it back to the job-site before driving off of the temporary drive.

Spilled concrete on roadways pose additional problems with the EPA, customers, and traveling, motorists.

Note: Do not travel on public roadways with chutes on.

JOB-SITE CONCRETE WASH OUT LOCATIONS

- If the washout containment is full and overflowing, call dispatch immediately (name of company representative) and note it on your ticket.
- Dispatch will then contact the local (Ms4) stormwater specialist (Management) making them aware of the situation.
- The owner/contractor will also be contacted for assistance in cleaning out the washout containment.

CONCRETE WASH OUT (BAD)

- Concrete wash out is pollution!
- Concrete washouts should be provided for delivery trucks.

CONCRETE WASH OUT (GOOD)

- Pit lined with 10 mil liner
- Stormwater run off protected from contamination

INLET PROTECTION (GOOD)

- Frames properly built
- Properly trenched
- Reinforced filter fabric Anchored
- Should allow for overflow in case of heavy rainfall

TYPES OF CONCRETE WASHOUTS

- Prefabricated
- Self-installed

Let’s Fix It – Washout Procedures

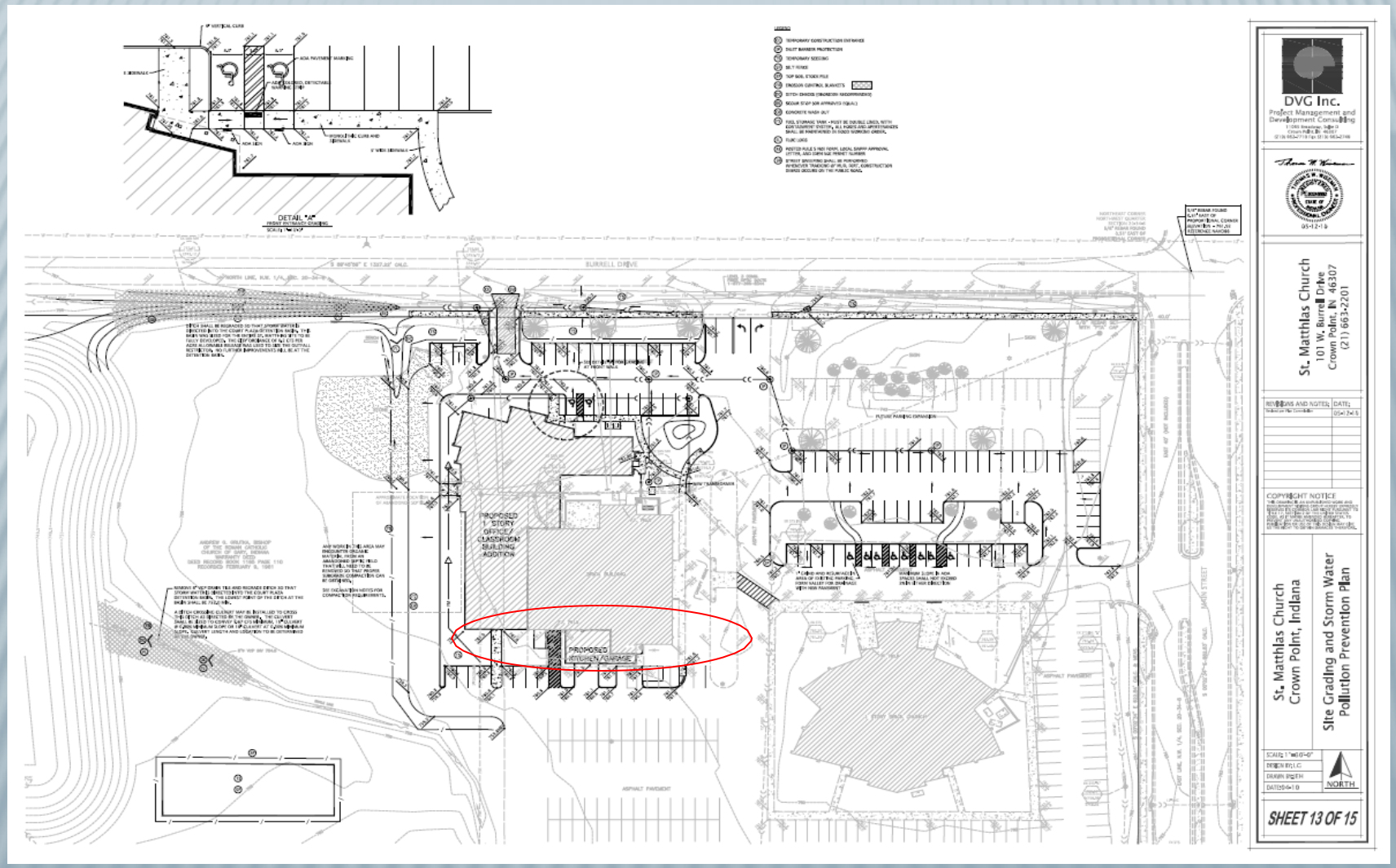
Washout Procedures

- When Washing out, there are a few simple rules to follow.
  - Do not leave extra concrete in your chutes or hopper
  - Remove as much mud as possible without using water
  - Use as little water as possible when washing out
  - Stop washing out in a particular location if you observe the water is running off.
  - Never add anything to your wash water

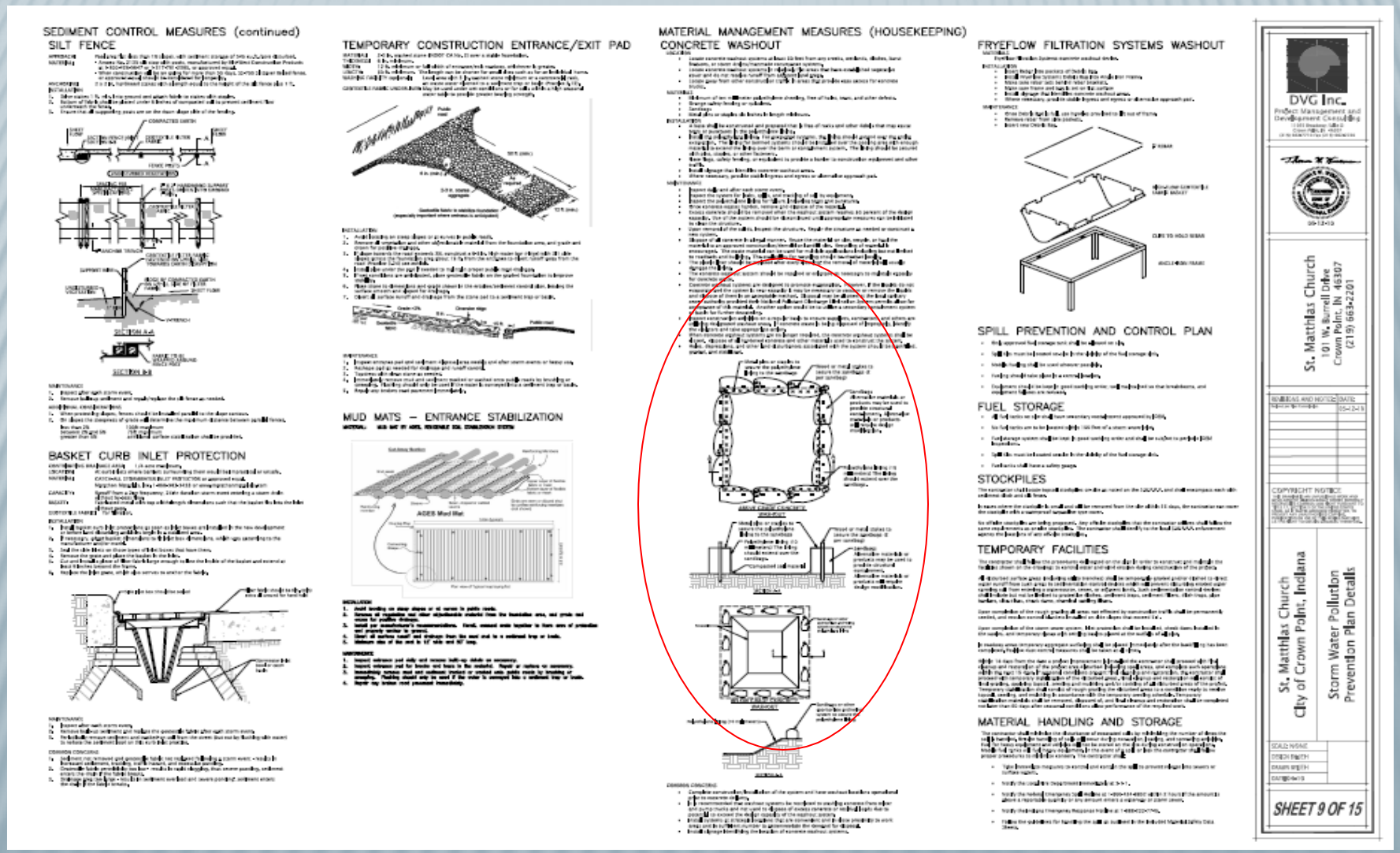
WASHOUT PROCEDURES

- Always try to empty your chutes or hopper at the pour.
- Never back- flush your truck at the jobsite except in an emergency and then only after obtaining the permission of the site owner and contractor
- Never add anything to your wash water.
  - Solvents or acid

Washout location and Design (SWPPP)



Details- Stormwater pollution prevention plans



SEDIMENT CONTROL MEASURES (continued)

SILT FENCE

BASKET CURB INLET PROTECTION

TEMPORARY CONSTRUCTION ENTRANCE/EXIT PAD

MUD MATS – ENTRANCE STABILIZATION

MATERIAL MANAGEMENT MEASURES (HOUSEKEEPING)

CONCRETE WASHOUT

FRYEFLOW FILTRATION SYSTEMS WASHOUT

SPILL PREVENTION AND CONTROL PLAN

FUEL STORAGE

STOCKPILES

TEMPORARY FACILITIES

MATERIAL HANDLING AND STORAGE

DVG Inc.
Project Management and Development Consulting

St. Matthias Church
101 W. Burrell Drive
Crown Point, IN 46307
(219) 663-2201

St. Matthias Church
City of Crown Point, Indiana

Storm Water Pollution
Prevention Plan Details

SHEET 9 OF 15

Reporting, Documentation and Enforcement

MONITORING/ MAINTENANCE DURING CONSTRUCTION

- Check all concrete washout facilities daily to determine if they have been filled to 75% capacity, which is when materials need to be removed.
- Ensure that plastic linings are intact and sidewalls have not been damaged by construction activities.
- If drivers have washed out their chutes or hoppers in other locations, you may need to provide more education, install additional signage, or place additional washouts in more convenient locations.

ENFORCEMENT

- Verbal warning to the construction site operator to make corrections. Initial verbal warning, min. 24 hours to correct, re-inspection free
- Written warning to the construction site operator to make corrections within a specified period of time. The period of time shall take account issues such as the severity of the problem, pending weather, seasonal conditions, and the level of effort necessary to correct the problem.

ENFORCEMENT

- Warning of non-compliance with directions to the construction site operator that site conditions require immediate action.
- Written pending stop work order, min. 48 hours to correct, re-inspection fee of $50.00
- Stop work order
- $200.00 fine + additional $50.00 re-inspection fee Total $300.00
- Failure to comply
- $1,000.00 per day until corrected

ENFORCEMENT – BOND

- A bond will be required initially or for any site that has been issued a STOP work Order. A one year maintenance bond, or other acceptable guarantee in the amount of 25% of the cost of the storm water drainage system is required.

ENFORCEMENT- INJUNCTIVE RELIEF

- It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this ordinance. If a person has violated, or continues to violate, the provisions of those ordinance, the authorized enforcement agency may petition any court of competent jurisdiction for a preliminary or permanent injunction restraining the person from activities which create further violations.

Fines$$$$

CITIZENS CAN INITIATE CIVIL SUITS AGAINST:

- An individual person
- A construction company
- The U.S. or any other government entity
- The EPA itself

Fines$$$$

- Avoid costly Stop Work Orders

In many jurisdictions, violations causing an immediate danger to the environment do not require prior notice for Stop Work Orders to be issued.

Fines$$$$

COMPLIANCE

- And even more costly fines of up to $25,000 *per day* from IDEM

Fines$$$$

EPA ADMINISTRATIVE FINES

- Currently $260 Million fines against builders in litigation
- No permit No SWPPP No inspection records
- Compliance Violations include
- No amendments to SWPPP

Conclusion

CONCLUSION

- Legal Concrete Washout Requirements

1. Contained Area:

   To prevent concrete slurry form entering storm sewers, ditches, stormwater ponds or other surface waters.

2. Defined Area:

   Signage identifying where concrete washout should be performed.

3. Rock Entrance:

   To prevent sediment tracking

CONCLUSION

- It is up to each of us in the ready mix industry to take special care and precautions to protect our industry from violating these regulations and from negative publicity.
- Please remain aware and alert to your washout procedures and help our industry stay a good neighbor wherever we work.

RESOURCES

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