City of CASSELTON

NORTH DAKOTA

Storm Water Management
Standards for Commercial,
Large Scale Residential,
and Single or Two Family
Residential Construction

Updated 2018

STORM WATER MANAGEMENT OVERVIEW

Growing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act. The Act established the basic structure for regulating discharges of pollutants into the waters of the United States.

This manual contains standard procedures and plans sufficient for typical commercial, large scale residential, and residential building construction in the City of Casselton. It is not intended to address all circumstances. The primary objective is to assist the contractor/owner in complying with all federal, state, and local agencies whose goal is to minimize the negative impacts of storm water runoff from a commercial or large scale residential construction site.

Storm water runoff can contain sediment, pollutants, and debris that drains into the city's storm sewer system and ultimately into the Maple River. Since the streets and gutters are conduits for draining storm water their protection is needed to maintain a healthy environment. Runoff can be caused by precipitation, snowmelt, or construction activities that are typical on a modern construction site.

To control this erosion and runoff, Best Management Practices (BMP's) are implemented. Their intent is to keep sediment and debris on the construction site and not allow it to reach the storm sewer system. The building permit holder (who is also responsible for the Storm Water Management Permit) is accountable for ensuring that adequate BMP's are in place and functioning until the project is completed. The construction project is considered complete when vegetation is reestablished to cover 70% of the permeable surfaces on the lot.

While reviewing the standards presented in this publication and considering implementation on your project, keep in mind that the intentions of BMP's is to prevent erosion and minimize sediments from leaving the lot. Failure to comply can result in damage to adjacent properties, damage to the storm sewer system, and pollution to streams, rivers and lakes located in the region.

The combination of BMP's presented in this manual will not cover every situation that may arise. Each builder must consider the situations that are unique to every site. If any questions or concerns arise, please feel free to contact Kevin Mayer at the City of Casselton Public Works Department (701-347-4861 ext 15). We are committed to helping all of those involved with the implementation of these construction procedures.

Copies of this booklet and other storm water management material can be found on the City's website http://www.casselton.com/bulding permits/

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BEST MANAGEMENT PRACTICES

Listed below are the allowed Best Management Practices (BMP's) for the City of Casselton.

➤ Perimeter Controls

Allowed erosion control devices include straw or rock wattle, silt fence, grass buffer strip, mulch or stabilized soil berm and other manufactured products used for perimeter control.

➤ Construction Entrance

A construction entrance for site access and deliveries is required. Crushed concrete, rock, class 5 and mulch are acceptable materials. Any construction site one (1) acre or larger must use rock.

➤ Inlet Protection

Protection for all street inlets and rear yard drains is required. Manufactured inlet protection products, rock wattles, straw wattles and re-enforced silt fences are acceptable controls.

➤ Concrete Washout Area

All concrete wash left on site must be contained and not allowed to enter storm water conveyances.

➤ Ditch Checks

Acceptable materials for concentrated storm water flows are rock checks, large straw wattles and reenforced silt fences.

Dewatering

All water that is pumped off site must go through a dewatering bag or structure if discharged to a city drainage conveyance system or waters of the state.

Good Housekeeping

Providing a clean construction site includes overall site management, material storage, hazardous material management and waste removal.

Other Erosion Control Devices

Other acceptable controls include erosion control blankets, temporary seeding, temporary diversion dikes, brush barriers, wind fences, sediment basins, surface roughening, compost filter berms or socks, riprap, straw or slash mulching, sodding, floating silt curtains, hydromulching and stockpile stabilization.

The City of Casselton is open to all suggestions and improvements on current erosion control products and techniques. Contact Public Works to approve devices not listed.

CONTRACTOR RESPONSIBILITIES

- 1. The Storm Water Management Permit holder (also the building permit holder) are responsible for making certain that all BMP's are in place and functioning until the project is completed. This person will be the contact for all violations and required compliance on the site.
- 2. A Storm Water Pollution Prevention Plan (SWPPP) must be approved prior to any site work. The SWPPP should be submitted along with the Building Permit application and Storm Water Management Permit application.
- 3. Periodic inspections shall be performed by the permit holder, or his/her designee, at least **once a week**. Inspections are also required within 24 hours following every ½ inch rainfall event to be sure that BMP's are functioning as intended. Any problems noted during these inspections should be corrected immediately. A log of the inspections and a detailed description of any measures taken to correct noted problems must be kept. The City of Casselton has available a Storm Water Compliance Calendar to aid in your inspections.
- 4. The permit holder is responsible for maintenance of all erosion and sediment control measures on site. It is critical that sediment not be allowed to enter the storm sewer. The permit holder is responsible for actions of **ALL** contractors and subcontractors on site. No work shall begin until necessary storm water BMP's are installed.
- 5. The temporary construction entrance provides a place for entering and leaving the construction site. The intent of the entrance is to provide a stable surface for vehicles entering and leaving the lot, as well as, to remove sediment buildup on tires. The contractor is responsible for ensuring that all employee and delivery vehicles use this entrance and do not disturb the erosion control devices in place. Proper maintenance of the temporary construction entrance is required until such time as a permanent driveway can be put in place.
- 6. For the duration of the project, the permit holder is responsible for making sure that mud, dirt, rocks, and other debris are not allowed to erode or be blown onto the city streets, sidewalks or nearby properties. In addition vehicles leaving the construction site shall not be allowed to track mud, dirt, rocks, or other debris onto the streets. Should any materials be tracked or eroded onto the street, the contractor shall take **immediate** steps to have it removed.
- 7. The Permit Holder is responsible for following all EPA and ND Department of Health permitting and erosion control requirements.
- 8. The Permit Holder is responsible for informing the homeowner of all requirements for erosion control if the site is not fully stabilized once construction is completed. Once a homeowner is issued a certificate of occupancy, 70% of the green space on the lot needs to have vegetation coverage within one year.
- 9. Good housekeeping on construction sites: 1) To ensure that debris, trash and other building materials (paint, oils, gasoline, etc) are properly disposed of and not allowed to enter any storm water conveyance. 2) Proper storage of hazardous materials and providing spill kits or spill containment where materials are stored.

CITY INSPECTIONS

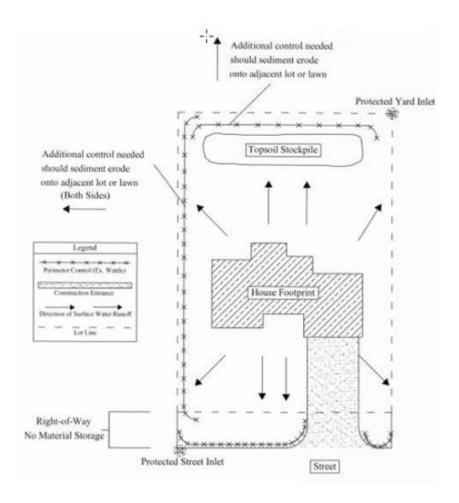
- 1. City inspectors will conduct an initial erosion and sediment control inspection in conjunction with post rainfall and routine inspections. Inspectors will verify that appropriate erosion and sediment control measures are in place and properly installed.
- 2. It is important that Storm Water Management Permit contact phone numbers, addresses and fax numbers are current. This ensures proper notification if a violation or issue arises. Contact Casselton Public Works at 701-793-0464 or e-mail to publicworks@casselton.org if the contractor's phone number or address changes.
- 3. During any inspection of the erosion and sediment control measures, if BMP's are not installed, are improperly installed, or if BMP's are ineffective, a "Notice of Violations/Order to Comply" shall be issued. The permit holder shall be instructed to correct the violation and/or control measure involved within forty-eight (48) hours.
- 4. Once the contractor has corrected the deficiency they shall call the City of Casselton Public Works Department during regular business hours (8 a.m. to 4 p.m.) to request re-inspection of their erosion and sediment control measures. Failure to inform the inspector within the forty-eight (48) hour timeframe will prompt a \$25 re-inspection fee.
- 5. Continued violations and/or failure to correct the initial violation can prompt the revocation of all City of Casselton permits (including building permit) and work will be stopped on site. Reapplication for all permits will be required once the violation has been corrected.
- 6. The permittee must allow the inspector to enter the site for the purpose of obtaining information, examination of records, conducting investigations and surveys. Failure to comply will result in all work on site being stopped.
- 7. The permittee must allow the inspector to bring such equipment upon the permitted site as is necessary to conduct such inspections, surveys and investigations. Failure to comply will result in all work on site being stopped.
- 8. The permittee must allow the inspector to examine and copy any books, papers, records, or memoranda pertaining to activities or records required to be kept under the terms and conditions of the permitted site. Failure to comply will result in all work on site being stopped.

Items Inspected

Perimeter Controls
Inlet Protection (Street and Yard)
Dewatering
Sediment Tracking on Roads
Sediment or Pollutants in Curb and Gutter
Debris/Trash Control
Hazardous Material Storage

Construction Entrance
Concrete Washout Areas
Boulevard Use
Maintenance of BMP's
Inspection Records
Damage to Adjacent Properties
Other Storm Water Controls

RESIDENTIAL EROSION CONTROL PLAN A



Notes for Plan A: - Single Family Home

- Typical drainage, perimeter controls along curbline, front access, street and/or yard inlets
- Perimeter controls needed on sides and back if sediment is eroding onto adjacent seeded or sodded lots
- Construction entrance or permanent access installed
- Rear yard topsoil stockpile
- Concrete washout required on site if no regional washout is provided

PERIMETER CONTROLS

Perimeter controls are vital in containing eroded sediment on site. There are several types of perimeter controls allowed by the City of Casselton, this section explains all types and maintenance of those controls. All perimeter controls must be installed prior to any land disturbing activity.

Allowable Perimeter Controls

Allowable perimeter controls are silt fence, straw or rock wattles, mulch or stabilized soil berms, grass filter strips and other manufactured products used for perimeter control.

Grass Filter Strips

Grass filter strips are excellent perimeter controls and are typically in place prior to the start of construction. It is important that the strip is not disturbed during construction. Listed below are some requirements of grass filter strips.

- The grass must be a minimum of four (4) inches long and a maximum of eight (8) inches.
- One (1) foot of filter strip is required for every five (5) feet of disturbed soil (for example 50 feet of disturbed soil requires a ten (10) foot wide filter strip).
- The filter strip must NOT be compacted or driven on. It is the permit holder's responsibility to ensure protection of the strip. (Temporary fencing may be required)
- Any place where the filter strip has been torn up, driven on or destroyed must be replaced by another perimeter control.
- Building materials cannot be stored on the filter strip.
- Filter Strips can only be used for sheet flow (equal runoff along perimeter).
- Filter Strips are only allowed for areas with slopes of 5% of less.







Maintenance of Grass Filter Strips

- Any sediment accumulation in the strip must be removed for the strip to function properly.
- Any gullies or very small brook formed in the strip must have additional controls.
- The filter strip must have living vegetation.
- Must be inspected during regular weekly inspections.
- Filter strip must have a minimum 70% vegetative cover.

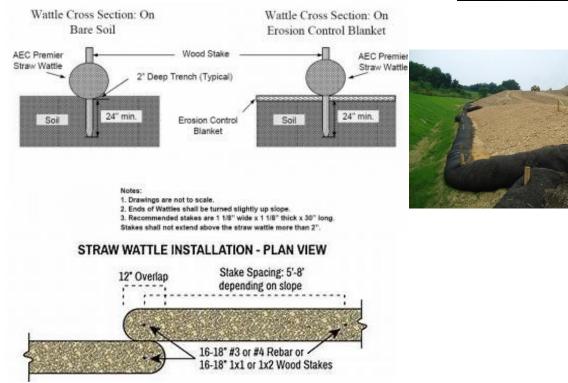
PERIMETER CONTROLS

Rock or Straw Wattles

Wattles are very easy to install and the most common perimeter control. They can be moved if needed and easily maintained. It is important that wattles are installed correctly and inspected regularly. Listed below are some requirements for rock and straw wattles:

- Wattles must be a minimum of six (6) inches in diameter.
- They must be J-hooked on the ends.
- They are NOT to be driven on or flattened.
- Wattles must not have any gaps under them.
- Connected wattles must overlap.
- Wattles must be staked or pinned down.





Maintenance of Rock or Straw Wattles

- Any wattle flattened to half its original height must be replaced.
- Sediment must be removed once it reaches 1/3 the height of the wattle.
- If wattles are moved they must be moved back by the end of the day.
- Any destroyed wattle must be replaced.
- Wattles must stay in place until final stabilization has occurred.

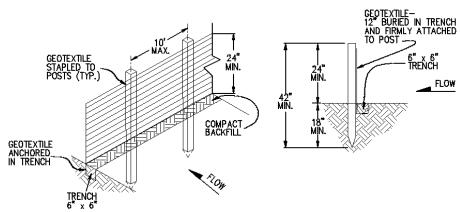
PERIMETER CONTROLS

Silt Fence and Manufactured Products

Silt fence and other manufactured products also work excellent for a perimeter control. One issue with silt fence in North Dakota is damage caused by high winds. Wire backing can prevent this type of damage. New manufactured products are appearing every year, many with promising erosion control characteristics.

Silt Fence

- Silt fence must be trenched in
- Silt fence must be J-hooked
- Posts must be on the outside of the fabric



Maintenance of Silt Fence

- Sediment that reaches 1/3 the height of the fence must be removed.
- Any torn or damaged fabric must be replaced or repaired.







Other Manufactured Products

Every year new and exciting manufactured products are introduced to the construction industry. Most new products have been field tested and are proven effective. Please consider the use of manufactured products as you prepare your site for construction.



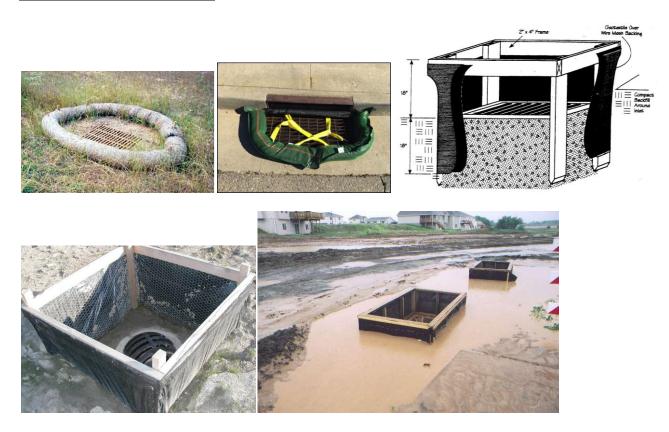
SMARTfence



INLET PROTECTION

Inlet protection is the last defense before sediment enters the storm sewer system. All inlets that receive runoff from a construction site must be protected (street and yard inlets). The purpose of an inlet protection device is to pond water, allowing sediment to settle out. There are many ways to protect an inlet. Below are several constructed types followed by manufactured inlet protection devices.

Constructed Inlet Protection



Maintenance of Inlet Protection

- Once eroded sediment has reached 1/3 the height of the device, the sediment must be removed.
- Any gap or hole in the device must be replaced or repaired.
- The device must remain in place until site is 70% vegetated.
- All street inlet devices must be removed by November 1st of every year.
- Any street inlet device that causes local flooding or a safety hazard, must have an overflow bypass.
- They must also be inspected regularly to ensure that they are functioning properly.

INLET PROTECTION

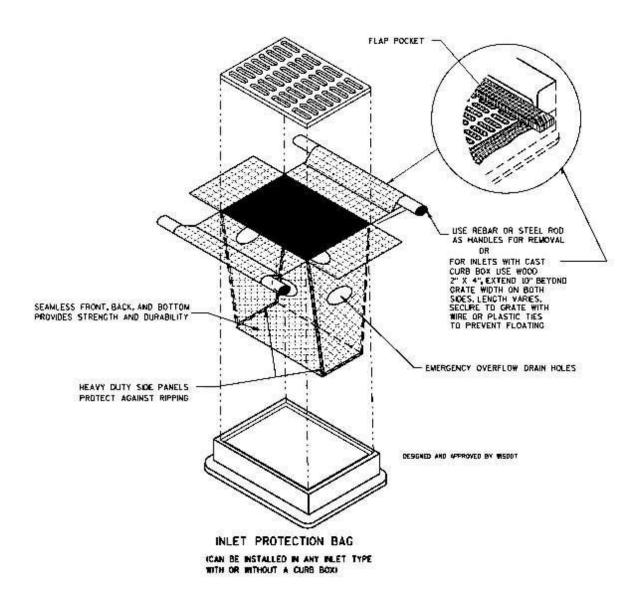
Manufactured Inlet Protection Devices

Manufactured inlet protection devices are becoming more and more common. They are relatively inexpensive and provide excellent protection for inlets. Several styles are available, including popup or drop down devices. Manufactured inlet protection devices are available locally and work for both yard and street inlets.









CONSTRUCTION ENTRANCE

Construction entrances are required for all sites whose permanent access is not yet installed. The goal of a construction entrance is to clean mud and dirt off the tires upon exiting a construction site. It is the permit holder's responsibility to ensure that all subcontractors and delivery personnel use the entrance. Listed below are the requirements for all construction entrances:

- Construction entrances must be composed of crushed concrete, rock, class 5 or mulch.
- Allowable materials all have different levels of effectiveness, choose material accordingly.
- Construction entrances must have a minimum depth of six (6) inches.
- Should the access block drainage from the road, a pipe must be installed along the curb to allow water to pass through to a street inlet.
- Should the access allow dirt or mud to be tracked onto the street, the roadway must immediately be cleaned (not by flushing).
- Vehicles should try to stay off site during wet conditions, parking on the street when applicable.





NOTE: City of Casselton Ordinance #86 requires contractors to remove all soil and sediment from vehicles before entering city streets. This includes deposits on tires.



Improperly constructed construction entrance

CONCRETE WASHOUTS

Concrete washout is one of the leading pollutants that enters the storm sewer system. It is considered a violation to allow concrete or other masonry wash-waters to enter a city drainage conveyance. Wash water disposal must be limited to a confined space, specifically designated for wash water. Listed below are the requirements of concrete washout:

- If no regional washout is provided, the site **MUST** have a constructed washout.
- The washout must be contained, meaning that none of the water can leave the washout area.
- The washout should be properly marked, allowing all drivers and personnel to find it.
- The washout must be a minimum of fifteen (15) feet away from any storm sewer inlet.
- Any washout that is deposited on the street or in the curbline must be cleaned up immediately (not by flushing).
- The permit holder is responsible for making sure all subcontractors and concrete workers use the designated washout area.
- The washout must be large enough to handle all washout water from the site.



Maintenance of Conrete Washout

- Washout must be emptied when 80% of capacity is used.
- All concrete and wash must be removed when completed.
- Any boulevard used must be restored to its original condition.
- Must be inspected during weekly inspections.



Washout Violations

DEWATERING

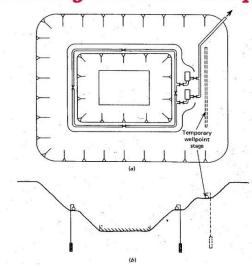
Standing water can be a problem on any construction site and most often is eliminated by pumping it off site. The water that is being pumped out is usually carrying fine sediment with it. This sediment will end up in the city's storm sewer if left untreated.

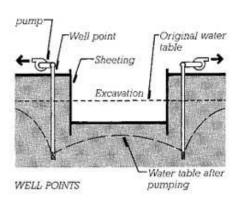
There are several ways to treat this sediment-rich water. Manufactured products can be used or a structure can be built to filter out the sediment. Dewatering bags are becoming more and more common. The dewatering bags are attached to the end of a hose so the sediment is contained in the bag. For larger amounts of water a dewatering structure can be constructed, there are several ways and materials that can be used in their construction. Refer to examples for construction details.

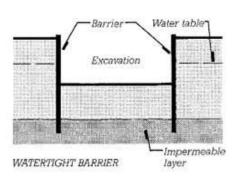
The dewatering of a construction site can greatly decrease the time it takes to complete a project. Waiting for a site to dry out naturally takes time and money away from your business. When done correctly the sediment is filtered out and the clean water can enter the storm sewer. The process may differ from site to site but the end goal on every construction site is the same CLEAN WATER.

Dewatering Methods - Wellpoints









OTHER CONSIDERATIONS

Seasonal Considerations

There are several items to consider when a construction site is not at final stabilization by time winter arrives. Listed below are several requirements dealing with seasonal change:

- Street inlet protection devices must be removed by November 1st of each year. This allows city plows to work without damaging the inlet or device.
- Moving your perimeter controls back two (2) feet, before winter, will ensure that city plows do not catch and destroy any in-place BMP.
- Spring snow melt is considered storm water runoff and is required to be treated.
- The permit holder is responsible for erosion control year-round until the permit is closed.

Boulevard Use

The boulevard is property of the City of Casselton and material storage is not allowed on it. The boulevard can be used as a filter strip during construction and a buffer from the street. The boulevard must be restored to its original condition if damaged or used during the construction process.

Adjacent Lot Use

Construction activities must remain within property limits. Any construction site that requires entering adjacent land must have written permission from that owner. Erosion control must also be provided for any disturbed land on that lot (especially boulevard damage).

Sidewalks

If a sidewalk is installed along the construction site, there are several requirements:

- The sidewalk must remain safe and hazard free for pedestrians.
- No driving is allow on ANY city sidewalk by Ordinance #289
- Any sediment eroded or tracked onto city sidewalks must be removed immediately.
- If any part of the sidewalk is to be removed, Public Works must be notified and a detour plan must be approved by the City and in place BEFORE work is started.
- Any sidewalk that has to be driven over, must be closed with a proper detour and a blister (of at least twelve (12) inches) installed over the sidewalk.

Questions and Contact Information

Any questions about storm water management or erosion control can be directed to Kevin Mayer at the City of Casselton Public Works Department. Contact information is listed below:

Kevin Mayer Casselton Public Works – 702 1st St N Phone (701) 347-4861 ext. 15 Fax (701) 347-4505

Email: publicworks@casselton.org

GOOD HOUSEKEEPING

Potential Sources of Storm Water Contamination

The purpose of this section is to identify pollutants that could impact storm water during and after construction of a project. Pollutants can be in many forms including liquids, powders, dust granules, soil and other sediments, building materials and debris leaving the worksite.

Good housekeeping measures can eliminate or significantly reduce these pollutants from contaminating the storm sewer system. The following are some measures that should be implemented on every worksite.

- Every worksite should be clean
- Each worksite should be inspected regularly to discover and remove potential sources of pollutants.
- Building supplies and waste material should be appropriately contained so that nothing can be blown off-site by wind.
- Potential pollutants should be stored to protect against accidental release during storm events.
- Spills and mechanical breakdowns should be anticipated by having a plan in place and materials on hand, to properly address such incidents.

Significant Materials Inventory

The more common pollutants that result from clearing, grading, excavation, road and home construction which have the potential to be present in storm water runoff, are listed in the table on the following page.

The table includes information regarding material type, chemical and physical description and specific regulated warm water pollutants associated with each material.

Good housekeeping measures should be concentrated on keeping these pollutants out of the storm water system.





Significant Materials Inventory

Material/Chemical	Physical Description	Storm Water Pollutants	Location	Process for Containment	
Pesticides (insecticides, fun- gicides, herbicides, rodenti- cides)	Various colored to color-less liquids, powders, pellets or grains	Chlorinated hydrocarbons, or- ganophosphates, carbamates and arsenic	Herbicides used for noxious weed control	Certified Applicator	
Permanent Seeding Fertilizer	Liquid or solid grains, nitro- gen and phosphorus	Nitrogen, phosphorus, organic substrate	Permanent cover – newly seeded areas	Organic base, slow release forms only, tied up in compost	
Cleaning Solvents	Colorless, blue or yellow- green liquid	Perchloroethylene, methylene chloride, trichloroethylene, pe- troleum distillates	No equipment clean- ing allowed in project limits	Tarps, monitor weather for rain and wind	
Wastewater from construction	Equipment washing rinse water	Water soil, oil, grease and solids	Equipment washing not allowed in project limits	N/A	
Asphalt	Black solid	Oil, petroleum distillates	Streets, roofing	Excess material to be removed from project limits	
Concrete	White solid	Limestone, sand	Driveways, curb and gutter, culverts, ma- sonry, foundations	Designated wash areas or complete haul removal	
Glue, adhesives	White or yellow liquid	Polymers, epoxies	Expansion joints, home construction	Empty container management	
Gypsum board	White solid or powder	Calcium carbonate	Home construction	Good housekeeping during construction	
Joint compound, wall and ceiling texture	White-grey paste or powder	Silica, calcium carbonate	Home construction	Good housekeeping during construction	
Paints	Various colored liquids	Metal oxides, Stoddard solvent, talc calcium carbonate, arsenic	Roadway stripping, home construction	Empty container management	
Curing compounds	Creamy white liquids	Naphtha	Curb and gutter	Follow manufactures recommendations	
Wood preservatives	Clear amber or dark brown liquids	Stoddard solvent, petroleum distillates, arsenic, copper, chro- mium	Timber pads, railroad tracks, home con- struction	Oil absorbing diapers, trained personnel	
Hydraulic oil/fluids	Brown oily petroleum hydro- carbon	Mineral Oil	Random leaks or broken hoses	Oil absorbing diapers, trained personnel	
Gasoline	Colorless pale brown or pink liquids	Petroleum hydrocarbon, ben- zene, ethyl benzene, toluene, xylene, MTBE	Secondary contain- ment	Oil absorbing diapers, trained personnel	
Diesel fuel	Clear blue-green to yellow liquid	Petroleum distillates, oil and grease, naphthalene, xylene	Secondary contain- ment	Oil absorbing diapers, trained personnel	
Kerosene	Pale yellow liquid petroleum hydrocarbon	Coal oil, petroleum distillates	Secondary contain- ment	Oil absorbing diapers, trained personnel	
Anti-freeze/coolant	Clear green/yellow liquids	Ethylene glycol, propylene gly- col	Random leaks and broken hoses	Trained personnel	
Soil erosion	Solid particles	Soil, sediment	Project limits	Prevention and stabilization measures within prescribed periods	

City of Casselton

Storm Water Management Permit

General Information

Site Address:					Acres:				
Start Date:	Completion	Date:	te: Phone:						
Owner/General Contractor: Email:				Email:					
Mailing Address:									
Permit Information									
New Single Family / Two Family Residential									
New Multi-Unit Residential *(Plans & SWPPP to be approved by City of Casselton)									
Commercial *(Plans & SWPPP to be approved by City of Casselton)									
Infrastructure * (Includes: Streets, Sewer, Water, Sidewalks, Utility, Etc)									
Any site over 1 acre requires	a permit from	the st	ate of North Dakota	l					
*SWPPP(Storm Water Pollution Prevention Plan) MUST include erosion/sediment control plan & site map									
Building Permit Number NDPDES Permit Number:									
I hereby certify that I have received and reviewed a copy of the Storm Water Management Standards for the City of Casselton and I am responsible for implementing, maintaining, and monitoring the effectiveness of the storm water management standards during construction on the lots listed above. I also understand that I may need to supplement or modify implemented protection measures as site conditions develop to control on-site erosion and ensure all site runoff is adequately treated by storm water controls. I will also be responsible for the actions of all subcontractors and delivery personnel at the worksite.									
Owner / Contractor Signature Date									
Printed Name Phone									
City Use Only									
Permit Number:	Date	Date Issued: Date		Date Ex	pired:				
Fee: Paid Permit Fee Schedule	#	Approved By:							
0 - 3 acres \$15 with a \$5 per acre additional fee for those over 3 acres			SWPPP Approval Number:						