

State of Vermont
Operations Division
Web: <http://www.aot.state.vt.us/maint/Operations.htm>

Agency of Transportation
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Best Management Practice: **“BRIDGE WASHING”**

Effective Date: 5/1/2013

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Director, Operations Division

VTTRANS STATE HIGHWAY SYSTEM BRIDGE WASHING BEST MANAGEMENT PRACTICES (BMPs)

PURPOSE STATEMENTS

Washing bridges is a preventative maintenance task performed on a recurring basis in order to protect bridge decks, components and superstructure against corrosive effects of chlorides, de-icing chemicals and the accumulation of sand on bridge surfaces throughout the winter.

The VTrans State Highway System Bridge Washing BMP guides maintenance activities in order to:

- ∞ Define appropriate level of service and performance expectations;
- ∞ Maintain safe bridges for the traveling public and bridge maintenance employees;
- ∞ Prevent infrastructure deterioration, extend useful life and provide for a better functioning structure;
- ∞ Comply with VTrans Policy and Federal or State rules and regulations;
- ∞ Reduce Cost (water consumption, energy, equipment and personnel costs);
- ∞ Protect water quality and aquatic wildlife habitats;
- ∞ Create mechanisms and standards for addressing environmentally sensitive areas;
- ∞ Preserve the scenic qualities of the highway corridor.

GUIDING PRINCIPLES

These BMPs have several guiding principles:

- ∞ VTrans Bridge Washing Policy;
- ∞ State and Federal Regulatory Requirements;
- ∞ Create consistent requirements throughout the state that protects water quality;
- ∞ Preserve the scenic qualities of the corridor to the extent practicable, while maintaining environmental stewardship and conserving resources.

LEVEL OF SERVICE & PERFORMANCE EXPECTATIONS

Sweep 100% and wash 50% of all bridges annually in the Spring. It is expected that all bridges will be washed at least every other year and that bridge washing operations are compliant with all applicable Safety and Environmental Regulations. Annual Trainings shall be provided to VTrans Maintenance Personnel directly involved in bridge washing activities.

GENERAL STANDARDS

These standards are applicable only to bridges on the VTrans State Highway System, are subject to the conditions and exceptions noted below and are intended to be implemented to the extent reasonable and practicable when not otherwise required by rule, regulation or law. Bridge washing operations shall not violate any written VTrans Policy or State/Federal Rule, Regulation or Permit.

The VTrans District Transportation Administrator (DTA) or its designee must ensure compliance with all VOSHA standards and the Manual for Uniform Traffic Control Devices (MUTCD) by use of contract language and safety plan review meetings with contractors or VTrans personnel. Items to be addressed in addition to VOSHA and MUTCD standards should include, but are not limited to, equipment loading, storage, and access plans; safety plans for working over water; traffic control and mobile operations sign planning, and protection of personnel, infrastructure, and the traveling public.

TARGET AUDIENCE

These BMPs are primarily intended for VTrans Operations Division. In addition, these BMP's may also be applicable to municipally managed structures and Municipal bridge maintenance crews.

Municipalities may wish to refer to these standards and implement the practices mentioned herein. VTrans will not be responsible for monitoring Municipal performance nor compliance under these standards and practices, but may serve as a technical resource for Municipalities regarding the implementation of these practices.

POLICY & REGULATORY REQUIREMENTS

VTrans Policy and State/Federal Regulations will dictate how, where and when these BMPs are applied and to what performance level. The BMPs noted herein are directed at addressing these requirements.

- ∞ VTrans Bridge Washing Policy (Attachment A) – applicable statewide
Requirements have statewide implications and include but are not limited to:
 - ∞ Removal and proper disposal of sand, debris and other material from bridge deck prior to use of water to clean bridge surface.
 - ∞ Water used to flush salts and de-icing chemicals from the bridge must come from a water source which has no potential to harm the receiving water body.
 - ∞ Minimize impact to the receiving waters when washing bridge seats, pier caps, diaphragms and any other superstructure (steel) components of the bridge.
- ∞ “Transport of Aquatic Plants and Other Nuisance Species” V.S.A Title 10 Chapter 50 Section 1454 <http://www.leg.state.vt.us/statutes/fullsection.cfm?Title=10&Chapter=050&Section=01454> (Attachment B) – applicable statewide.
On July 1, 2010 the then 22-year old law was amended prohibiting:
 - ∞ Transport of any invasive aquatic species in Vermont. Specifically, the law prohibits transport on the outside of boats, personal watercraft, trailer or other equipment. That means the outside of an intake hose on any pump or water truck and any pump equipment used by VTrans to get water from natural water bodies. This is a law that has statewide jurisdiction and may require:
 - ∞ Avoid taking water from document water bodies that are known to have aquatic invasive species http://www.anr.state.vt.us/dec/waterq/lakes/docs/ans/lp_transportlaw2010.pdf
 - ∞ Drawing water from nearby municipal water supplies or stand pipes installed by various fire districts or other clean/non-contaminated water source.
 - ∞ Clean off any equipment used for “working over water” safety programs before moving to next bridge.

- ∞ Vermont Water Quality Standards in effect or as may be amended and are applied statewide.
<http://www.nrb.state.vt.us/wrp/rules.htm>
- ∞ Federal Clean Water Act – National Pollutant Elimination System – Municipal Separate Storm Sewer System (MS4) General Permit – applicable in designated MS4 areas.
 - ∞ Districts with bridges in MS4 areas are **NOT** allowed to discharge bridge deck washing water into water bodies subject to MS4 Permit requirements. The list of waters is noted on ANR’s web site (link below) and is subject to change. This is a regulation that has limited geographical jurisdiction in the state that can and does change periodically. See the Agency of Natural Resources MS4 Map: http://www.vtwaterquality.org/stormwater/docs/ms4/sw_MS4_map.pdf
- ∞ Federal Migratory Bird (MBTA)/Bald & Golden Eagle Protection Act and Endangered Species Act – applicable statewide. Both Federal programs are intended to protect species of concern.

The MBTA provides that it is unlawful to pursue, hunt, take, harass, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg or any such bird, unless authorized under a permit issued by the Secretary of the Interior. Some regulatory exceptions apply. Take is defined in regulations as: “pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.” The Bald/Golden Eagle Act is extremely comprehensive, prohibiting the take, possession, sale, purchase, barter, or offer to sell, purchase, or barter, export or import of the bald or Golden eagles at any time or in any manner.

<http://www.fws.gov/migratorybirds/mbpermits/ActSummaries.html>

The migratory bird species protected by the Act are listed in 50 CFR 10.13. View the list of [MBTA protected birds](#) and Migratory Bird Program Rule at <http://www.fws.gov/migratorybirds/index.html>.

The Endangered Species Act (ESA) and the Vermont Rare, Threatened, and Endangered Species Rules (VRTER) are designed to regulate a wide range of activities affecting animals designated as endangered or threatened, and the habitats upon which they depend. With some exceptions, the ESA and VRTER prohibits taking and other activities affecting these protected species and their habitats unless authorized by a permit. Permitted activities are designed to be consistent with the conservation of the species.

Take - From Section 3(18) of the Federal Endangered Species Act means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

<http://www.fws.gov/endangered/species/index.html> and http://www.vtfishandwildlife.com/cwp_elem_spec_rte.cfm

Contact VTrans Program Development Environmental Program Staff Biologist or the Vermont Department of Fish & Wildlife (links below) if you find a nest with or without eggs or young and if you feel you have a rare, threatened or endangered species present (ie. Bats or other listed species using the bridge has habitat). Be advised, you may be instructed to avoid disturbing the nest and to wash areas around the nest, leaving the nest undisturbed.

http://vtransengineering.vermont.gov/sections/environmental/natural_resources and http://www.vtfishandwildlife.com/cwp_contact_us.cfm

- ∞ Highway Safety – applicable statewide
The DTA or its designee must ensure compliance with all VOSHA standards and the Manual for Uniform Traffic Control Devices (MUTCD) by use of contract language and safety plan review meetings with contractors or VTrans personnel. Items to be addressed in addition to VOSHA and MUTCD standards should include, but are not limited to, equipment loading, storage, and access plans; safety plans for working over water; traffic control and mobile operations sign planning, and protection of personnel, infrastructure, and the traveling public.

BRIDGE WASHING PROCEDURES & BEST MANAGEMENT PRACTICES

1. **Prepare for and set up a work plan** for each bridge site addressing, among other things:
 - a. Traffic control, fall protection, working over water plan, and other MUTDC/VOSHA requirements.
 - b. Location of bridges to be washed and acknowledgement of higher standards if located in a designated MS4.
 - c. Consider proximity of bridge to various clean bridge washing water sources (even sources on route),
 - d. Consider presence of invasive/nuisance aquatic plants/organisms in local surface water sources;
 - e. Consider presence of bird nests or other protected species and complete coordination with the VTans Program Development Environmental Section's Staff Biologist or Vermont Department of Fish & Wildlife prior to disturbing any nests, birds or other protected species. Bridge washing between April 1 and August 1 is more likely to encounter birds and nesting. Bridge Maintenance Crews that experience recurring bird use, nesting or use by rare, threatened or endangered species may want to consider installing deterrents on that specific bridge.

2. **Identify appropriate water source** for bridges scheduled for washing:
 - a. Check for local sources of fresh/clean water and if considering using a local water body as source, check Agency of Natural Resources (ANR) web site for presence of aquatic invasive/nuisance species. If the surface water body intended for use to fill the tanker truck is or is suspected of carrying aquatic invasive/nuisance species then that water body SHALL NOT be used and an alternate clean water source will need to be found, most likely municipal.
 - b. When considering water sources, first consideration is to use a clean untreated or de-chlorinated water source from a municipal supply, second from fire stand pipe in the same watershed as the bridge scheduled for washing, and final last option is from a water body under bridge being washed or in the same watershed if the bridge is not over waters and those water bodies are not known or suspected of carrying aquatic invasive/nuisance species.
 - c. If the only available option is to use a surface water body to fill a water tanker truck first inspect all hoses, pipes, pumps that will come in contact with the water for any plant material or mud prior to putting this equipment into the water....remove any materials if found and properly dispose of the plant material. Proper disposal means bagged and disposed of in trash receptacle. After pumping is completed, inspect again and remove plant materials and mud if any are found before moving on to the next bridge. Empty tanker truck of all water taken up from surface water body before moving onto the next bridge.
 - i. **Inspect** and clean off any aquatic plants, animals, and mud from all equipment before leaving bridge location where water was drawn from.
 - ii. **Drain** pumps, hoses and all other water containing devices.
 - iii. **Dispose of unused water on location if source of water is from non-municipal supply.**
 - iv. **Never dump live fish, vegetation or other organisms from one water body into another.**

The intent of these actions is to clean off any visible large-bodied organisms attached to equipment. Draining can also remove small organisms such as zebra mussel veligers, however, additional steps are needed to remove small-bodied organisms from other parts of the equipment. Those can be easily rinsed off or die out of water in a short period of time. To this end, added precautions that improve treatment effectiveness are to:

- i. **Spray/rinse** equipment with high pressure hot water to clean off mud and kill aquatic invasive species,
 - ii. **Flush pump** motor according to owner's manual, and/or
 - iii. **Dry** everything for at least five days before reuse or **wipe** with a towel before reuse.
- d. If a surface water body is used as bridge washing water source the pipes/hoses used to withdraw water shall be screened to prevent fish entrainment and to help prevent uptake of vegetation.

3. **Prior to washing bridge surface**, the following activities will be completed:
 - a. Sweep sand, debris and deicing chemical contaminated sediment from the bridge.
 - b. Sweepings will be removed by hand using shovels, wheelbarrows or bobcat buckets and placed off the roadway shoulder. Larger amounts of sweepings will be spread out along roadway shoulder after trash and larger debris has been removed for proper disposal. Sweepings can also be trucked back to Maintenance Yard and added to sand pile for future re-use (again after trash and larger debris has been removed and properly disposed of). Sweepings will not be swept into open deck drains or over the edge of the bridge.
 - c. Prior to washing bridge surfaces, all scuppers and other drains will be blocked with unbroken sand bags to prevent accidental discharge of wash water to surface waters under bridge or onto roadway below bridge.
 - d. Brush and vegetation may need to be removed from around wings abutments and piers. Any vegetation management in river buffers should follow the VTrans Riparian Tree and Brush Cutting BMP. <http://vtransoperations.vermont.gov/bmp>
 - e. Invasive terrestrial (plant) species encountered and in need of removal should be managed per the VTrans Invasive Species BMP. <http://vtransoperations.vermont.gov/bmp>
4. **Prior to washing bridge superstructure**, the following activities will be completed:
 - a. If nests are found while on-site working or if you feel you may have a rare, threatened or endangered species present (ie. Indiana Bat or other listed species using the bridge as habitat), contact Vermont Department of Fish & Wildlife http://www.vtfishandwildlife.com/wildlife_nongame.cfm or VTrans Environmental Biologist http://vtransengineering.vermont.gov/sections/environmental/natural_resources.
 - b. If bird nests are present they must not be disturbed. Bridge washing operations may proceed so long as nests and birds can be avoided and left undisturbed.
 - c. If rare, threatened or endangered species are suspected or are present, Bridge Maintenance Crews must contact VTrans Environmental Biologist or Vermont Department of Fish & Wildlife to confirm species and secure guidance on how to proceed before bridge washing operations commence on that specific bridge.
5. **Washing the bridge surface and superstructure** will follow these procedures:
 - a. Water hose nozzles will be aimed to minimize overspray into surface waters or roads below bridge.
 - b. Limit psi when washing steel bridge components so as to avoid the accidental dislodging of paint which might end up in the water body beneath the bridge. Pressure washing equipment shall be operated at pressures that do not damage the paint or other coatings on the bridge or undercut the grout or harm the masonry plates beneath the bearings.
 - c. Water will be aimed along the curb line to wash any accumulated sand/salt towards the bridge down slope.
 - d. Washing will include bridge joints, finger joint troughs, bridge shoe and seats and any bridge components that are within the splash zone.
 - e. To the extent practicable, washing of bridges will be scheduled on structures over waterways during the springtime to coincide with high-flow periods or during other high-flow periods following storm events.
 - f. Any bridge deficiencies should be repaired or noted and added to the work schedule.
 - g. **Bridge deck washing in designated MS4** – All bridge drainage systems shall be blocked during surface washing and to the extent practicable, residual wash water will be diverted to upland areas (i.e. over embankments into vegetated areas or into catch basins) so that sediments may settle out prior to reaching the waterway. Water washed over a vegetated area must not cause scour or contribute to sedimentation of the waterway. This is an absolute requirement in MS4 designated watersheds.
 - h. **Bridge deck washing in designated MS4** - REPORT within 5 business days, to VTrans Operations Environmental Program Stormwater Technician any accidental discharges to water bodies and corrective measures taken to cease the discharge and prevent additional discharges.
 - i. Clean off any equipment used for “working over water” safety programs before moving to next bridge.

USEFUL LINKS

VTrans Bridge Washing Policy

<https://inside.vermont.gov/agency/vtrans/VTransIntranetHome/Ops/Policy%20and%20Procedures%20Manual/BridgeWashing3011.pdf>

VSA Title 10 – Aquatic Plants & Aquatic Invasive Species Transport Law

http://www.vtwaterquality.org/lakes/htm/ans/lp_ans-index.htm

http://www.anr.state.vt.us/dec/waterq/lakes/docs/ans/lp_transportlaw2010.pdf

ANR Aquatic Invasive Species Site (Map)

http://www.vtwaterquality.org/lakes/docs/ans/lp_aismapmajorspecies2011.pdf#zoom=100

http://www.vtwaterquality.org/lakes/docs/ans/lp_infestedwaterbodieslist.pdf

Migratory Bird Treaty Act & Bald/Golden Eagle Protection Act

<http://www.fws.gov/migratorybirds/index.html>

View the list of [MBTA protected birds](#)

<http://www.fws.gov/migratorybirds/mbpermits/ActSummaries.html>

Federal Endangered Species Act

<http://www.fws.gov/endangered/species/index.html>

Vermont Rare, Threatened, and Endangered Species

http://www.vtfishandwildlife.com/cwp_elem_spec_rte.cfm

State of Vermont DEC - EPA NPDES – State MS4

http://www.vtwaterquality.org/stormwater/htm/sw_ms4.htm

Map of designated MS4's

http://www.vtwaterquality.org/stormwater/docs/ms4/sw_MS4_map.pdf

VT Water Quality Standards

<http://www.nrb.state.vt.us/wrp/rules.htm>

VTrans Training PowerPoint (most recent posted on VTrans Web Site)

<http://vtransoperations.vermont.gov/bmp>

OSHA

Contact VTrans Safety Officer

http://vtransoperations.vermont.gov/technical_services/occupational_safety

VTrans Safety Site (working over water, etc)

Contact VTrans Safety Officer

http://vtransoperations.vermont.gov/technical_services/occupational_safety

VTrans Riparian Tree & Brush Cutting BMP

<http://vtransoperations.vermont.gov/bmp>

VTrans Invasive Species BMP

<http://vtransoperations.vermont.gov/bmp>

Operations Division Vermont Agency of Transportation	Original Policy Adopted Date: N/a	Original Identification No. 05-MOP--3011
Policy and Procedures Manual	Responsible Section: Maintenance Districts	Policy Name: Bridge Washing
Subject: Training	Approval Date: 11/29/2005	Page(s) 1 of 1

Statutory Reference / Other Authority: Federal and state rules and regulations, and the Manual on Uniform Traffic Control Devices (MUTCD)

Approved by: Samuel B. Lewis, Director of Operations

BRIDGE WASHING

Purpose:

Bridge preventive maintenance is critical in extending the life of bridges. Decks, seats, pier caps and troughs need to be periodically cleaned of debris and salt residue. Over the winter, sand and debris accumulate along the deck /curbing interface, as well as on abutments or pier caps, allowing a perfect medium for residual salt to penetrate to the reinforcing steel and cause deterioration of both the steel and structural concrete. It is important that the process of removing of the sand and debris is accomplished early in the spring and in a manner that does not harm the environment or violate state or federal regulations.

Policy:

Sand, debris, and other material must be removed from the bridge deck prior to the use of pressure water which will remove the salt latents from the deck/curbing interface. Appropriate removal of material can be accomplished with hand tools and power or hand brooms. All removed material must be deposited in an area which will not affect the river, brook or other body of water crossed by the bridge. Generally, an appropriate place for depositing the material can be found along the approaches of the bridge. **No foreign material can be deposited over the side of the bridge rail, even if it is not directly over water!**

Water used to flush the salt latents from the deck must come from a source which has no potential to harm the receiving water body. Scuppers will need to be sand bagged or plugged if they have a direct route to the body of water crossed by the bridge.

Care needs to taken when washing bridge seats, pier caps, and diaphragms to minimize any impact on the receiving water.

Traffic control shall follow the guidance provided in the MUTCD.

It is expected that bridges will be washed at least every other year.

Law Prohibits the Transport of Aquatic Plants and Aquatic Invasive Species in Vermont

Invasive species such as Eurasian watermilfoil and zebra mussels are typically spread by “hitchhiking” on boat trailers, propellers and fishing gear that isn’t cleaned, or in bilge water, bait buckets, or livewells that aren’t drained before moving to a different water body. It often takes only a tiny fragment of an invasive plant, sometimes less than an inch, to start a whole new infestation.

On July 1, 2010, Vermont’s 22-year old law prohibiting the transport of important aquatic invasive species changed. Previously, the law prohibited the transport of the invasive plants Eurasian watermilfoil and water chestnut. Come July 1, Vermont’s invasive species transport law prohibits the transport of **all aquatic plants or aquatic plant parts** on the outside of a vehicle boat, personal watercraft, trailer or other equipment.



The law defines an aquatic plant as “...a plant that naturally grows in water, saturated soils or seasonally saturated soils, including algae and submerged, floating leafed, floating, or emergent plants.”

A poster titled "CLEAN BOATS CLEAN WATERS" with the slogan "No More Free Rides". It contains text about Vermont law, a diagram of a boat with labels for Hitch, Live Well, Transom Well, Rollers, Axle, and Lower Unit/Propeller, and instructions on what to do when leaving a body of water.

**CLEAN BOATS
CLEAN WATERS**

No More Free Rides

Under Vermont Law, you may be fined up to \$1000 for transporting any aquatic plant or plant fragment, zebra mussels or quagga mussels. So carefully inspect and clean your boat and trailer every time you take them out of the water.

WATERCRAFT CHECK POINTS

Hitch Live Well Transom Well
Rollers Axle Lower Unit/Propeller

When you leave a body of water:

- Clean** off any mud, plants (even small fragments), and animals from boats, trailers and equipment. If possible wash at home or at a car wash.
- Drain** boat and equipment away from water.
- Dry** anything that comes into contact with water.

Never release plants, fish or animals into a body of water unless they came out of that body of water.

The law change means both the public and those who enforce the law will not have to know how to distinguish one type of aquatic plant from another.

Vermont’s invasive species transport law also will continue to prohibit the transport of two animal species, zebra mussels and quagga mussels.

The full law is available [here](#).

A person who violates this law may be subject to a penalty of up to \$1,000 per violation (Vermont Statutes Annotated Title 23, Chapter 29 § 3317. Penalties).

More information

- Click [here](#) for the full text of Vermont’s aquatic invasive species transport law.
- For more information on aquatic invasive species, visit the VT Water Quality Division Web site at <http://www.vtwaterquality.org>