Maryland Transportation Authority

Six Minimum Control Measures Progress Report FY 2023 and FY 2024

October 31, 2024, Submittal

National Pollutant Discharge Elimination System General Permit for Discharges from State and Federal Municipal Separate Storm Sewer Systems Permit Number 13-SF-5501

SUBMITTED TO:

Maryland Department of the Environment
Water and Science Administration
1800 Washington Boulevard
Baltimore, Maryland 21230

SUBMITTED BY:

Maryland Transportation Authority
Office of Engineering and Construction
Environmental Discipline
300 Authority Drive
Baltimore, Maryland 21222

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Six Minimum Control Measures Progress Report

FY 2023 and FY 2024

October 2024

National Pollutant Discharge Elimination System (NPDES)
General Permit for Discharges from State and Federal Small Municipal Separate Storm Sewer Systems (MS4)

MDE Contact:

Ms. Deborah Cappuccitti
Senior Regulatory Compliance Engineer
Maryland Department of the Environment
Water and Science Administration
1800 Washington Boulevard, Baltimore, MD 21230

Phone: (410) 537-3543

Web: www.mde.state.md.us

MDTA Contact:

Mr. Tigstu Belay, P.E.
Environmental Review & Permitting Lead
Maryland Transportation Authority
Office of Engineering and Construction
Environmental Discipline
300 Authority Drive, Baltimore, MD 21222

Phone: (410) 537-7844
Email: tmekonnen@mdta.maryland.gov

Web: https://mdta.maryland.gov/

Ms. Jessica Seipp, PMP
Consultant Stormwater Compliance Lead
Maryland Transportation Authority
Office of Engineering and Construction
Environmental Discipline
300 Authority Drive, Baltimore, MD 21222

Phone: (443) 254-0741
Email: jseipp3@mdta.maryland.gov

Web: https://mdta.maryland.gov/

ACRONYMS AND ABBREVIATIONS

BHT	Baltimore Harbor Tunnel Thruway
BMP	Best Management Practice
CFR	Code of Federal Regulations
CMI	Construction Management and Inspection
COMAR	Code of Maryland Regulations
CTP	Consolidated Transportation Program
DOT	Department of Transportation
EEIMS	Enterprise Environmental Information Management System
EMS	Environmental Management System
EO	Environmental Objective
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
ESRI	Environmental Systems Research Institute
ESD	Environmental Site Design
FMT	Fort McHenry Tunnel
FSK	Francis Scott Key Bridge
FY	Fiscal Year
GIS	Geographic Information System
HWN	Harry W. Nice Memorial/ Senator Thomas “Mac” Middleton Bridge
ICC	Inter County Connector
IDDE	Illicit Discharge Detection and Elimination
JFK	John F. Kennedy Memorial Highway
MCM	Minimum Control Measure
MD	Maryland
MDE	Maryland Department of the Environment
MDOT	Maryland Department of Transportation
MDTA	Maryland Transportation Authority
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OEC	Office of Engineering and Construction
OESRM	Office of Environment, Safety, and Risk Management
PB	Point Breeze
PRD	Plan Review Division
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RPC	Responsible Personnel Certification
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasures
SWM	Stormwater Management
SWPPP	Stormwater Pollution Prevention Plan
TBU	Transportation Business Unit
TJH	Thomas J. Hatem Memorial Bridge
TMDL	Total Maximum Daily Load
WO	Work Order
WPL	William Preston Lane Memorial Bridge

1 Introduction

The Maryland Transportation Authority (MDTA) maintains coverage of its properties under the *National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from State and Federal Small Municipal Separate Storm Sewer Systems (MS4)*, referred to as the "General Permit" or "Permit", issued by the Maryland Department of the Environment (MDE). The goal of the Permit is to control and improve the quality of stormwater discharged from State and Federal properties by requiring permittees to comply with six minimum control measures (MCMs). The MCMs are:

- Public or Personnel Education and Outreach,
- Public or Personnel Involvement and Participation,
- Illicit Discharge Detection and Elimination (IDDE),
- Construction Site Stormwater Runoff Control,
- Post Construction Stormwater Management, and
- Pollution Prevention and Good Housekeeping.

The latest General Permit, Permit No. 13-SF-5501, became effective on October 31, 2018. In addition to the six MCMs, this Permit incorporates the Chesapeake Bay Total Maximum Daily Load (TMDL) requirements for nutrients and sediment issued by the U.S. Environmental Protection Agency (EPA). The TMDL requirements are met by treating 20 percent of the untreated impervious area, determined as of a permittee established baseline year, using MDE-approved best management practices (BMPs). The MDTA submitted a Notice of Intent (NOI) for coverage under this Permit in October 2018. The General Permit expired on October 31, 2023, and has been administratively extended until a new permit is issued. The MDTA has continued to implement measures to comply with the permit's six MCMs. This report summarizes activities completed by The MDTA during the past two fiscal years, FY 2023, and FY 2024, from July 1, 2022, through June 30, 2024.

1.1 The MDTA Properties

Properties covered by the Permit include toll roadways, tunnels, and bridges along with associated assets and facilities. These include:

- I-95 (John F. Kennedy Memorial Highway including the Express Toll Lane and Travel Plazas) in Baltimore, Harford, and Cecil Counties (JFK)
- I-895 (Baltimore Harbor Tunnel Thruway) in Baltimore City and Baltimore, Howard, and Anne Arundel Counties (BHT)
- I-95 and I-395 (Fort McHenry Tunnel) in Baltimore City (FMT)
- I-695 (Francis Scott Key Bridge) in Baltimore City and Baltimore and Anne Arundel Counties (FSK)

- U.S. 301 over Potomac River (Harry W. Nice Memorial/ Senator Thomas “Mac” Middleton Bridge) in Charles County (HWN)
- U.S. 50 over Chesapeake Bay (William Preston Lane Memorial Bridge) in Anne Arundel and Queen Anne’s Counties (WPL)
- U.S. 40 over Susquehanna River (Thomas J. Hatem Memorial Bridge) in Harford and Cecil Counties (TJH)
- MD 200 (Inter County Connector/ ICC) in Montgomery and Prince Georges Counties (ICC)
- Point Breeze in Baltimore City (PB).

Associated facilities include campuses for administration, finance, human resources, engineering, maintenance, the MDTA Police, and E-Z Pass customer service. Buildings and parking lots in these complexes are covered under this Permit.

Facilities where maintenance activities occur (e.g., garages, storage bins, salt barns) are regulated under the *General Permit for Stormwater Associated with Industrial Activities* (*Permit No. 20-SW*).

1.2 Program Resources

Since January 2005, the MDTA has committed operating and capital funds to address permit compliance requirements. **Table 1** shows a breakdown of the approximate expenditures to implement the six MCMs over the permit term. Costs represent implementation over six years as MDE administratively extended the Permit on October 31, 2023, until a new permit is issued. These values are based on historical spending in earlier permit years.

These funds are used for education, outreach, training, inventory, inspections, assessments, maintenance, construction, and other efforts directly related to meeting the General Permit requirements.

Table 1: Six Minimum Control Measures Expenditures

Minimum Control Measures	Approximate Expenditures
Public or Personnel Education and Outreach	$820,000
Public or Personnel Involvement and Participation	$160,000
Illicit Discharge Detection and Elimination (IDDE)	$540,000
Construction Site Stormwater Runoff Control	$12,600,000
Post Construction Stormwater Management	$9,000,000
Pollution Prevention and Good Housekeeping	$1,040,000
Total	**$24,160,000**

2 Minimum Control Measures

The MDTA has continued to implement the programs developed in the previous permit term to meet the six MCM requirements specified in Part IV of the current Permit. The following sections describe how each MCM was addressed by the MDTA during FY 2023 and FY 2024.

The information provided in these sections supplements the responses provided by the MDTA in Minimum Control Measures Reporting Forms, provided in Appendix D of the General Permit.

2.1 MCM No. 1 - Public or Personnel Education and Outreach

2.1.1 Develop a process by which the public and/or staff can report water quality complaints that must include a phone number, within one year of permit issuance.

The public and staff can submit complaints related to stormwater at the 24/7 MDTA police dispatch number, 410-537-7911, which is advertised on the MDTA website (https://mdta.maryland.gov/Police/traffic-safety). The MDTA is currently evaluating the addition of a “Report a Problem” link on the MDTA website for easier reporting of an issue. The MDTA is proactive in addressing and correcting issues while minimizing impacts to the safety of travelers on roadways and adjacent property owners. Typically, environmental staff investigate the stormwater issue, assess the cause, and develop remedial recommendations. The MDTA also responds to requests from local municipalities to provide roadway emergency services for impacts from storm events. This process normally involves several of the MDTA divisions, such as Communications, Engineering, Construction and Operations. There were no water quality complaints received in FY 2023 or FY 2024.

2.1.2 Determine the target audience and develop materials to educate the audience on the impact of stormwater.

The target audience for this MCM is the MDTA staff, including managers, engineers, inspectors, and maintenance staff across many divisions. The training and educational materials developed for this audience are provided in **Appendix A** and described below**.**

2.1.3 Distribute stormwater education materials through newsletters, website, or other appropriate methods. Submit examples of educational material to MDE in accordance with reporting requirements.

To educate the target audience, the MDTA continues to distribute stormwater-related education materials through several forms of communication, such as trainings, brochures, presentations, websites, workshops, and various types of signage. These materials and educational platforms are discussed below.

- **Web pages** - The MDTA maintains various web pages and online resources to provide the target audience with 24/7 access to information. These web pages are advertised to employees via email, including:

- "Maryland: Smart, Green and Growing": The MDTA is registered in the Maryland Green Registry. This platform provides information about the State's efforts to restore the Chesapeake Bay and preserve green space as well as implement green initiatives to improve the environment. The MDTA's green initiatives can be found on the Maryland Green Registry's website and under Member Profiles: https://mde.maryland.gov/MarylandGreen/Pages/GreenMemberList.aspx.
- MDTA's enterprise Geographic Information Systems (GIS): This user-friendly tool is accessible to all the MDTA staff and provides summary data on inventory, inspection, and remediation. Also included in the tool are stormwater management (SWM) BMP photos and plans.
- MDTA's intranet website: This website includes links to standard operating procedures (SOPs), including those that protect the environment, such as SOPs for spill containment, management of recycled materials, and environmental inspections. It also includes information regarding where the MDTA employees should take household hazardous waste as well as tips on personal efforts that can help the environment. Information such as the guide to MDE's Environmental Permits and Approvals, mapping from the Chesapeake Critical Area Commission, and the Maryland Department of Natural Resources Roadside Tree Laws are also available on this website.
- MDTA's external environmental web page: The MDTA has an external environmental website:
  http://www. MDTA.maryland.gov/Environment/Home.html

  The website contains the MDTA's Environmental Policy Statement and information on the MDTA's sustainability initiatives, such as its energy conservation, recycling, fuel management, and stormwater management initiatives.
- MDTA's Bay Bridge web page: This web page includes content by "Spike & Otis", the seagull characters also found in radio spots and posters, who promote public information about the MDTA's roadways and crossings and promote safety www.baybridge.maryland.gov.

- **Publications** - The MDTA prepares various forms of publications for internal use and public information, including:
  - Engineering Policies and Procedures: The MDTA continued to distribute procedures related to environmental design and recordkeeping during FY 2023 and FY 2024. These documents describe each phase of the project design process and related environmental permitting and compliance steps, various types of permits, and the associated agency for each permit. These policies and procedures are distributed to employees via email and are available on the MDTA intranet.
  - Connections e-newsletter: The MDTA distributes an internal monthly e-newsletter via email that contains articles related to the environment, health, and safety. The e-newsletter also advertises upcoming activities such as field trips. Connections

encourages employees to participate in various environmental programs, such as the MDTA's Earth Day fairs and contests. Each year, the newsletter highlights Earth Day activities.

- **Handouts** - During FY 2023 and FY 2024, four (4) handouts were updated and distributed during the MDTA Earth Day event. Approximately thirty (30) of each fact sheet were distributed and are provided in **Appendix A.1**. The fact sheets included:
  - What is the MDTA doing to protect Maryland's waters?
  - Stormwater Pollution Prevention Plan (SWPPP) Inspections
  - Why should we care about water quality? What can we do about it at home?
  - Illicit Discharge Detection and Elimination (IDDE) Testing

These topics are appropriate for the target audience because the day-to-day responsibilities of employees can impact stormwater quality. Given the industrial nature of operational activities at the MDTA, employees often handle hazardous chemicals, oils and grease, and large machinery. By understanding the impacts of potential pollution from these operations on Maryland's waters, employees can carry out their job descriptions more safely and efficiently.

2.1.4 Develop and implement an annual employee training program that addresses appropriate topics to prevent or reduce the discharge of stormwater pollution into the MS4. Submit example training materials and attendee list to MDE in accordance with reporting requirements.

The MDTA delivers a comprehensive training program that promotes environmental awareness to personnel, using a variety of approaches such as in-person training, presentations, guidance documents, and intranet web pages. This training program involves diverse staff across many divisions, including managers, engineers, inspectors, and maintenance staff. Copies of training materials and sign-in sheets are provided in **Appendix A**.

- **Environmental Briefings for Managers** - Throughout the year, the MDTA executive and management-level personnel are briefed on the progress and the importance of environmental compliance, particularly with the NPDES Permit program. Details are communicated during management meetings to inform managers of compliance requirements and to ensure that resources and funding sources are maintained. For FY 2023 and FY 2024, meetings included briefings for executive staff and senior management on continuing efforts to meet the requirements of NPDES permits (the General Permit and the 20-SW Industrial Stormwater General Permit). Maryland Department of Transportation (MDOT) leadership was briefed on environmental activities at the MDTA.
- **Environmental Training** - The MDTA performs annual environmental training for staff at each maintenance facility. Several trainings are offered to the MDTA personnel throughout the year:

- Spill Prevention Control and Countermeasures (SPCC): These trainings focus on stormwater pollution prevention, spill prevention, control, and countermeasures, and waste management related to the Resource Conservation and Recovery Act (RCRA). This training is required for all facility maintenance crews and is also offered to all the MDTA personnel. The SPCC training topics include handling of oil and petroleum products and spill response, identification of major versus minor spills, and spill prevention. The training modules include group discussions, short videos, and an informal quiz. Waste management/RCRA training addresses topics such as RCRA regulations, hazardous, solid, and universal waste disposal, and waste management. This module includes group discussion and a short informal quiz. In FY 2023, the MDTA conducted ten (10) in-person SPCC trainings for a total of 207 employees. In FY 2024, MDTA conducted nine (9) in-person SPCC trainings for a total of 292 employees. A copy of the training presentation is included in **Appendix A.2**.
- Stormwater Pollution Prevention Plan (SWPPP): The SWPPP training specifically addresses the requirements in the General Permit and 20-SW Permit. Topics such as SWPPPs, Chesapeake Bay TMDL, IDDE, erosion and sediment control (ESC), and good housekeeping procedures are covered. Information on the quarterly facility inspections and sampling at the outfalls, a requirement of the 20-SW General Permit, is also included. The training sessions include group discussion and interactive exercises focused on identifying stormwater issues in the field, recognizing pollutants and illicit discharges, and estimating spill volumes. The training is updated each year, and new activities are added. In FY 2023, the MDTA conducted eleven (11) in-person SWPPP training events for a total of 279 employees. In FY 2024, the MDTA conducted twelve (12) in-person SWPPP training events for a total of 254 employees. Copies of the training and sign-in sheets for FY 2023 and FY 2024 are included in **Appendix A.3** and **Appendix A.4**.

- **Natural Resources Training/Outreach** - During FY 2023, the MDTA's Natural Resource Division provided Invasive Species Management and Pesticide Calibration training with facility representatives. The training was held at FMT with the purpose of instructing Operations staff on how to properly calibrate equipment during pesticide application. A copy of the training presentation and a summary of additional outreach and natural resources initiatives for FY 2023 and FY 2024 are included in **Appendix A.5**.
- **Professional Training** - The MDTA staff continued to broaden their stormwater expertise by participating in a variety of training events and professional groups. Staff viewed webcasts sponsored by the U.S. EPA, MDE, and the American Society of Civil Engineers (ASCE) that focused on NPDES compliance and Chesapeake Bay TMDL implementation. Staff also attended stormwater and environmental conferences and training sessions such as the American Society of Highway Engineers Water Resources Conference, ACEC/MW TMDL Symposium, Annual Transportation Research Board

Meeting, and Chesapeake Water Environment Association Stormwater Seminars. The content of these events provides overall stormwater awareness, as well as specific technical information and professional growth and networking opportunities.

- **BMP Maintenance Training** - The MDTA continued to train operations staff on preventative maintenance of BMPs. Maintenance manuals for each facility are provided and include information related to its BMPs, such as inventory, descriptions, location maps, and standard maintenance work orders. Training included field instructions on how to inspect BMPs and perform maintenance activities. In FY 2023 and FY 2024, the MDTA provided BMP trainings for facility representatives at each facility. The training focused on landscape and vegetation management best practices for roadside and SWM BMP facilities. A copy of one of the training presentations and sign-in sheet at one facility is included in **Appendix A.6**. This training and additional discussion of BMP Maintenance Manuals that were developed are further discussed in Section 2.5.4.

2.1.5 Briefly describe in reports to MDE how the education programs complement and strengthen other programs of the MS4 permit.

The stormwater education program complements other programs relating to the General Permit by educating how to prevent stormwater pollution through awareness of key issues and improved behaviors. Through the education program, the target audience learned about topics such as IDDE, spill response, stormwater pollution prevention, BMPs, and good housekeeping. As a result of these trainings, findings from IDDE and construction site stormwater runoff control programs are improved because of the increased knowledge and participation of the MDTA staff. For instance, the target audience is aware of what stormwater pollution, or an illicit discharge can look like, they may notice and report issues that may arise to the appropriate manager.

Similarly, the target audience may now be inclined to change their personal behavior through such actions as washing vehicles at designated car washes, containing vehicular fluids with absorbent booms, or planting rain gardens at their own residences.

The MDTA evaluates the effectiveness of this MCM program by comparing reported complaints and examining the frequencies of illicit discharges detected, spills, and BMPs that are in passing condition year to year. As fewer discharges are reported, fewer complaints come in, and BMPs maintain a passing condition, then MDTA can conclude that the program is effective at educating and empowering employees to protect water resources through their actions at work and at home.

2.1.6 Summary of activities planned for the next reporting cycle.

The MDTA will continue to hold regular training sessions for its employees and produce additional outreach materials. It will also continue to advertise online resources to staff to ensure they have immediate access to information. The MDTA will also continue to address water quality complaints quickly and effectively.

2.1.7 MCM implementation cost over the permit term.

The MDTA anticipates spending approximately $820,000 over the course of the permit term to implement this MCM.

2.2 MCM No. 2 - Public or Personnel Involvement and Participation

2.2.1 Determine the target audience to promote public and/or staff involvement and participation activities.

The target audience for the General Permit includes the MDTA employees, the general public in adjacent communities, travelers, and project stakeholders. Outreach activities led by the MDTA are designed to engage this audience.

2.2.2 Specify activities appropriate for the target audience and promote participation.

Activities appropriate for this target audience include events such as public notices and meetings, the MDTA initiatives, trash pickups, volunteering events, Earth Day events, and other "pop-up" events. The information presented at these events directly relates to the daily job responsibilities of the target audience, the majority of whom are employed by the MDTA.

These activities are valuable and appropriate for the target audience because the MDTA employees are continually working in and around the environment and stormwater assets. Involvement in these activities increases their awareness of issues and situations related to preventing stormwater pollution.

2.2.3 Perform at least five public and/or staff participation events during the permit term and report to MDE in accordance with reporting requirements.

Activities completed during FY 2023 and FY 2024 included:

- **MDOT / MDTA Initiatives** - staff participate in programs that promote environmental compliance and stewardship. The MDTA also participates in MDOT work groups composed of MDOT Transportation Business Units (TBUs). Some of the topics discussed in the work groups include emerging technologies to meet the Chesapeake Bay's restoration requirements.
    - Environmental Management System (EMS) - The EMS is implemented across MDOT TBU's.
    - MDOT Annual Attainment Report - This report measures the progress of the MDOT TBUs toward achieving their strategic goals through projects in the Consolidated Transportation Program (CTP). The Environmental Stewardship sections of these reports summarize the environmental achievements of these TBUs, including the MDTA. Copies of the environmental stewardship sections of the MDOT 2022 and 2024 Annual Attainment Reports are provided in **Appendix B.1**.
    - MDOT Excellerator Performance Management System - This system is composed of 10 tangible results that drive the business decisions of the TBUs. The Excellerator report is

available on the MDOT website. The ninth tangible result, which is to "Be a Good Steward of Our Environment" measures the following areas:

- Water Quality Treatment to Protect and Restore the Chesapeake Bay
- Stormwater Cleanup – Street Sweeping and Inlet Cleaning
- Bay Restoration Program Spending
- Recycled Waste from Office and Non-Office
- Recycled/Reused Materials from Maintenance Activities and Construction/Demolition Projects
- Fuel Efficiency: Miles Per Gallon and Total Gallons Consumed
- Utility Electricity Use
- Renewable Energy Generation
- Air Quality Emissions

- **MDTA's Bay Bridge web page** (www.baybridge.maryland.gov) - This web page has children's games that help families become aware of the Bay as an environmental and cultural resource.
- **MDTA Earth Day Fair** - The MDTA Office of Environment, Safety, and Risk Management (OESRM) organizes this event annually. Staff from the Office of Engineering and Construction (OEC) manned a table during the 2023 and 2024 events. OEC staff used an Enviroscape to educate attendees about stormwater pollution and practice they could implement at the MDTA facilities and at home to help reduce polluted runoff. OEC staff also distributed fact sheets about IDDE, SWPPP, water quality, and ways to protect water quality. During the 2024 event, OEC gave a presentation on stormwater, stormwater pollution, and practices that the MDTA implements to help reduce stormwater pollution. Approximately 69 people attended the 2023 event and 92 people attended the 2024 event. Copies of the fact sheets are provided in **Appendix A.1** and copies of the presentation and photos from the event are included in **Appendix B.2**.
- **Turner Station Earth Day Event** - The MDTA helped sponsor the 2024 Turner Station Earth Day event held on April 20, 2024. The MDTA was one of seven (7) sponsors. Approximately 90 volunteers helped collect over 32 bags of trash from the waterline and the park. The MDTA staff manned a both using an Enviroscape to educate volunteers about stormwater pollution and practices they could implement on their properties to help reduce polluted runoff. Photos from the event are included in **Appendix B.3**.
- **Environment Management System (EMS)** - The MDTA's EMS team meetings were paused during 2024; however, implementation of components of the MDTA's EMS continued. Representatives from OESRM facilitated quarterly facility inspections, we handled and disposed of all facility waste, awarded a new 3-year contract for 3rd party

audits, performed two 3rd party audits, held Department of Transportation (DOT) HazMat training, and facilitated staff outreach through the MDTA's Earth Day events.

- **Storm Drain Markers** - To increase stormwater awareness among the public, the MDTA affixed permanent storm drain markers, shown in the adjacent figure, on the MDTA's storm drains along access roads and travel plaza parking lots. These markers tell the public not to dump in the storm drains and that drainage goes to the Chesapeake Bay. The public can scan the bar-code on these markers with a smart phone to access a website with stormwater pollution prevention information. The MDTA is listed as a sponsor on this website: *www.StormDrainMarkingUSA.com*. Markers are replaced when the markings become faded or damaged.
- **Tree Planting** - The MDTA planted 2,064 trees in FY 2023 and 4,445 trees in FY 2024 as part of their environmental stewardship.



Storm Drain Marker

Table 2 quantifies the public and staff involvement in various activities.

Table 2: Summary of Public or Personnel Involvement and Participation

Activity	Quantity
Number of participants at public and/or staff events	250+
Quantity of trash and debris removed at clean-up events	35+ bags
Number of employee volunteers participating in sponsored events	10+
Number of trees planted	6,509

2.2.4 Provide public and staff members access to the permittee's MS4 Progress Reports via website or other method and consider any substantive public and/or staff comments received concerning the permittee's MS4 program.

The Annual MS4 Progress Report submitted to MDE can be accessed by the MDTA and MDOT staff. Staff can review the reports and submit comments to the OEC staff responsible for preparing the MS4 report. Staff-provided comments are strongly considered and are incorporated into the MS4 program where applicable. The MDTA is working toward publishing a summary of the Annual MS4 Progress Report on the MDTA website.

2.2.5 Comply with all State and federal public notice requirements for any regulated activity associated with this general permit.

The MDTA notifies the target audience of any regulated activities under the General Permit. To notify the public and project stakeholders about stormwater pollution and control activities in the planning, design, and construction phases of all major projects, the MDTA has set up public notices and meetings. Major projects (discussed in **Section 2.4.5**) involve the following:

- Conducting public hearings and public meetings,

- Providing a point of contact between the public and the project team,
- Proactively informing adjacent property owners and key stakeholders of pending construction activities, potential environmental impacts, and impacts that were avoided,
- Promoting environmental mitigation/stewardship projects, for example, with news releases on upcoming MDTA construction projects that describe environmental efforts related to the work,
- Offering project stakeholders a chance to provide input into specific project decisions,
- Holding field meetings during construction to resolve any public concerns.

2.2.6 Summary of activities planned for the next reporting cycle.

The MDTA will continue to host events and promote public/staff involvement in activities related to stormwater pollution prevention, such as the MDTA and Turner Station Earth Day events.

2.2.7 MCM Implementation Cost over the permit term.

The MDTA anticipates spending approximately $160,000 over the permit term to implement this MCM program.

2.3 MCM No. 3 - Illicit Discharge Detection and Elimination

2.3.1 Develop and maintain an updated map of the MS4 that identifies all stormwater conveyances, outfalls, stormwater BMPs, and waters of the U.S. receiving stormwater discharges.

The MDTA continues to review information related to stormwater structures as new projects are constructed. Attribute and spatial information for drainage pipes are logged in a comprehensive GIS geodatabase that depicts the drainage network owned by the MDTA. A map created from this information is updated annually and is maintained in the MDTA's database. In addition, illicit discharge screening and outfall inspections are logged in the NPDES database.

2.3.2 Establish a policy or other agency directive that prohibits illicit discharges into the MS4.

The MDTA, prohibits illicit discharges into the MS4 through environmental directives. The OEC has published the *Illicit Discharge Detection and Elimination Directive* for the MDTA employees prohibiting illicit discharges into the storm drains. This directive has been made available to employees on the MDTA's intranet. The MDTA has published the *Environmental Management System (EMS) Manual,* which outlines policies that foster environmental protection and reinforces practices among the MDTA employees that are essential to operations. The EMS Manual also outlines the various operations that would be conducted by the MDTA staff, including maintenance of underground storage tanks, construction and earth-disturbing activities, storage of petroleum products, and concrete/asphalt surfacing, and their potential to impact water resources. The EMS Manual can be accessed on the MDTA intranet.

2.3.3 Maintain the capability to access the storm sewer system across the entire property(ies) to investigate and eliminate illicit discharges (e.g., maintain physical access, proper internal permissions).

The MDTA maintains access to its storm sewer system by ensuring that access points are in good condition. This maintenance involves tending to outfalls and surrounding areas to ensure vegetation, debris, or a safety hazard are not preventing access. The MDTA is also in contact with property owners of areas surrounding the MDTA outfalls. This close coordination allows the MDTA constant access to stormwater conveyance systems without trespassing. Site accessibility allows the MDTA to address illicit discharges and other water quality concerns promptly after they are reported.

2.3.4 Develop and implement written SOPs.

The MDTA has procedures to proactively detect and address potential illicit discharges. The screening for illicit discharges involves visual inspection of storm drain outfalls or affiliated drainage structures. If there is any type of dry-weather flow three days after a storm event, the discharge is characterized, the source of discharge is investigated, as-needed corrective actions are evaluated, and appropriate actions are taken.

The *Illicit Discharge Detection and Elimination Practices and Procedures Manual* (updated January 29, 2019) developed by the MDTA documents the procedures for conducting IDDE inspections. The manual includes the following information, as required by the General Permit:

- An inspection checklist for collecting site description, outfall description, structural integrity of the outfall, characteristics of the discharge, and measurement of chemical parameters in case a dry weather flow is observed at the outfall,
- Frequency of outfall inspections — up to 100 outfalls per year per the General Permit requirements, as the MDTA, at more than 2,000 acres, is considered a large property,
- Procedures for identifying the source and eliminating spills, illegal dumping, and other suspected illicit discharges,
- Identification of priority areas or hot spots for illicit discharge screening based on pollution potential.

The directive and EMS manual referenced in **Section 2.3.2** include information related to the following:

- Policy to ensure illicit discharges are eliminated,
- Procedures to inform employees, businesses, and the general public of the issues relating to illegal discharges and improper waste disposal, and
- Coordination with adjacent operator(s).

2.3.5 Submit SOPs to MDE for review and approval within 2 years of permit issuance. MDE will review for consistency with the guidance [in the permit] in Appendix B, Section II.

The MDTA provided the SOP in the Year 2 Progress Report submission to MDE, which has been approved.

2.3.6 Document results of illicit discharge screening efforts, including a description of how screening locations were prioritized, and any necessary follow-up investigations and remediation measures implemented to address any suspected discharge. Submit to MDE in accordance with reporting requirements.

There are over 1,800 outfalls within the MDTA's MS4 boundary, and 20%, up to 100 outfalls, are required to be screened annually per MDE guidelines. Generally, the MDTA prioritizes screening of major NPDES outfalls, which are storm drainpipes with an equivalent diameter of 36 inches or larger that discharge to Waters of the United States. However, for the recent IDDE inspections, the MDTA has been considering all outfalls. The MDTA performs IDDE screening on a 3-year cycle, with outfalls generally grouped by facility whenever possible to optimize inspection logistics. The MDTA performs more frequent screening at selected outfalls when there may be a suspected illicit discharge. Outfalls identified as having a higher pollutant potential at MDTA facilities include LBEH00017, LBEH00019, LBEH00037, HTEH00119, HTEH00020, HTEH00245, HTEH00246, FTEH00124, KBEH00082, KBEH00083, KHEH00861, KHEH00872, NBEH00009, and NBEH00012. These outfalls were identified as high-priority outfalls because their drainage areas include multiple potential pollutant sources.

During FY 2023 and FY 2024, illicit discharge screenings were conducted for NPDES outfalls along roadways associated with BHT, FSK, FMT, JFK, WPL, and ICC. In FY 2023 and FY 2024, 109 and 125 outfalls or associated upstream inlets were inspected, respectively. Field test kits were used to test dry weather flows observed at 6 outfalls in FY 2023 and 13 in FY 2024. The dry weather flows were screened for temperature, pH, chlorine, phenol, copper, and detergents. A map of outfalls inspected during FY 2023 and FY 2024 is included in **Appendix C.1**. The executive summaries for the FY 2023 and FY 2024 IDDE reports are included in **Appendix C.2** and **Appendix C.4**.

Dry weather flow screening for FY 2023 and FY 2024 found all flowing outfalls to be compliant with threshold parameter/ contaminant values. Therefore, no illicit discharges were identified in FY 2023 or FY 2024.

For cases where a true illicit discharge is discovered, it will be traced through the drainage system to determine the source. If it originates on a neighboring property, the landowner will be contacted. If the source is on the MDTA property, clean-up procedures will be initiated based on the material. The MDE response unit may be called, in appropriate instances. The source of the illicit discharge will be eliminated, and the site will be closely monitored to prevent recurrences.

The MDTA also addresses discharges from vehicular spills along highways and major crossings. Discharge Notification Forms are completed that record the date, time, and location

of the spill, and the authorities that were notified and procedures that were used to clean up the spill and properly dispose of the hazardous materials. When required, documentation is provided to MDE. **Table 7** in **Section 2.6.2** summarizes reported spills on MDTA roadways in FY 2023 and FY 2024.

The MDTA also has a drainage inspection protocol for storm drain outfalls to assess drainage performance and structural condition. As part of the IDDE investigations, the drainage structure conditions are noted. Where warranted, remedial work orders are developed to address deficiencies. Drainage inspections also help identify potential illicit discharge issues for further investigation.

During FY 2023 and FY 2024, 39 and 29 outfalls with maintenance concerns were identified, respectively. These outfalls had cracking concrete, vegetation buildup, sediment accumulation, and/or corrosion in the pipes. Remedial actions taken to resolve these issues included structural repair or replacement of headwalls and pipes and removal of vegetation or sediment accumulation. The MDTA continues work to address the issues identified in FY 2023 and FY 2024.

2.3.7 Maintain complete records of IDDE program investigations and make them available to MDE during field reviews of the permittee's MS4 program.

The MDTA maintains records of all IDDE inspections electronically. These records are updated after every IDDE inspection.

2.3.8 IDDE education and training program.

As part of the annual environmental training, the MDTA provided IDDE training to 279 employees in FY 2023 and to 254 employees in FY 2024 during the annual SWPPP trainings. Employees learned how to identify pollutant types, observe pollutant characteristics, and report findings to the appropriate authority, which can investigate and eliminate the illicit discharge. Materials developed to meet education and training requirements are provided in **Appendix A.3** and **Appendix A.4**. These materials include sections of the stormwater pollution prevention training related to IDDE inspection.

2.3.9 MCM implementation cost over the permit term

The MDTA anticipates spending approximately $540,000 over the permit term to implement this MCM program.

2.4 MCM No. 4 - Construction Site Stormwater Runoff Control

2.4.1 Submit erosion and sediment control plans to MDE (or other authority when applicable) for review and approval in accordance with COMAR and with the Maryland Stormwater Management and Erosion and Sediment Control Guidelines for State and Federal Projects (February 2015).

The MDTA prepares ESC plans for construction activities involving land disturbance exceeding 100 cubic yards or 5,000 square feet. The plans are submitted for MDE review and approval per the Guidelines.

2.4.2 Ensure compliance with requirements under MDE's 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control or more recent revision and COMAR 26.17.01.

All MDTA construction projects are governed by the Code of Maryland Regulations Title 26, Subtitle 17, Chapter 1 (COMAR 26.17.01). The chapter governing ESC consists of 11 regulations. The MDTA complies with Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland and State and federal laws, regulations, ordinances, and procedures that regulate construction site activity.

2.4.3 Ensure all necessary permits have been obtained, including MDE's General Permit for Stormwater Associated with Construction Activity for projects disturbing one acre or more, and local sediment and erosion control plan approval.

Construction projects are initiated only when the required permits, including ESC Plan Approvals, as applicable, are acquired. For projects with disturbances that exceed 1 acre, the MDTA obtains coverage under the *General Permit for Stormwater Associated with Construction Activity (20-CP General Permit)* in compliance with the federal NPDES program requirements.

2.4.4 Develop a process for receiving, investigating, and resolving complaints from any interested party related to construction activities within the property(ies). Notify the complainant of the investigation and findings within seven days.

Non-compliance findings and complaints from different stakeholders are reported directly to project construction management and inspection (CMI) staff or indirectly through other contacts within the MDTA. Information and updates from CMI staff for active construction projects is distributed monthly within the OEC and makes it possible to direct complaints to the respective staff without delay. The general procedure to address noncompliance findings and concerns is for field management staff to investigate and recommend corrective actions when required in consultation with MDE's Compliance Inspectors. CMI staff have the authority to direct the construction contractor to perform corrective actions to resolve complaints in a timely manner. Complainants are notified of the follow-up actions accordingly. CMI staff ensure that complaints, action items, and routine inspections are documented.

No construction complaints were received during FY 2023 and FY 2024.

2.4.5 Track all active grading permits for each property covered under this general permit and report disturbed areas for all active grading permits to MDE in accordance with reporting requirements.

There were 40 active construction projects in FY 2023 and FY 2024 that were issued grading permits. The projects had a combined disturbed area of 495.38 acres and have been reported to MDE. A list of the active construction projects and their corresponding disturbed areas for FY 2023 and FY 2024 is provided in **Appendix D.1**.

2.4.6 Ensure that construction site inspections and enforcement procedures are performed in accordance with COMAR. This will require ongoing communication and collaboration with MDE to ensure that any violations are properly addressed.

At the MDTA, engineering design and construction of projects is overseen by the Office of Engineering and Construction. Under this office, the Environmental Engineering Discipline applies for and acquires permits during a project's design development.

During construction, the project's CMI team and the Contractor shoulder compliance responsibility. As necessary, an independent ESC quality assurance (QA) inspector, outside the project team, is also retained for additional oversight. Prior to construction, the Contractor notifies MDE at least seven (7) days in advance to schedule a pre-construction meeting with MDE representative(s). The CMI team, typically consisting of a project engineer and several inspectors, oversees the Contractor's performance, ensuring the Contractor follows the approved plans and standard construction procedures, maintains inspection records including communications with MDE, and performs regular site inspections to ensure compliance. Regular inspections are conducted by the CMI team and periodic inspections are performed by the MDE inspectors. In the event of non-compliance or violations, they coordinate with the Contractor and Environmental Engineering Discipline. The CMI team directs the contractor to perform the corrective actions to ensure conformance. If the MDE compliance inspector finds non-compliance or violations, it is communicated to the CMI team who coordinates with the Contractor to perform the corrective actions. After corrective measures are taken, that parties conduct a field visit to ensure the measures are satisfactory.

Construction site inspections are performed by the MDTA team members to ensure safety and adherence with the 20-CP General Permit. The inspectors are required to have a valid certificate of attendance for the responsible personnel training. Inspections are performed immediately after installation of sediment controls, once in seven (7) days (or after 4 business days as agreed upon during the pre-construction meeting) and after a storm event of 0.25 inches or greater within 24 hours. For sites located in Tier II waters, inspections are conducted twice a week in addition of inspecting the site after a storm event of 0.25 inches or greater. For sites requiring turbidity monitoring, inspections are conducted once per day on which the discharge occurs.

The Contractor coordinates with the CMI team on potential changes to approved plans. The CMI team, in turn, coordinates with the MDE compliance inspector regarding the proposed modifications. Minor field modification requests can be approved by the MDE inspector, be

performed without revisions to the approved plans. If the MDE compliance inspector determines that proposed field modifications must be reviewed and approved by MDE Plan Review Division (PRD), the CMI communicates the inspector's determination to the Environmental Discipline. The Environmental Discipline coordinates with the designers and MDE PRD to obtain modified plans' approval.

The MDTA did not receive violation notices from MDE during FY 2023 and FY 2024. As a result, there were no enforcement activities.

2.4.7 Incorporate procedures within property operations to effectively abate sediment pollution and comply with all applicable State and federal laws pertaining to erosion and sediment control practices.

For all project work, including those performed as part of regular O&M that may not require a grading permit, the MDTA follows the SHA standard specifications for construction and materials with special provisions for MDTA. The specifications are maintained online and serve as the standard policy documents guiding sediment pollution abatement and prevention on the MDTA facilities. In addition, all the MDTA facilities operate under the 20-SW General Permit. The SWPPPs and annual employee training for 20-SW General Permit (discussed in **Section 2.6.2**) specifically address erosion and sediment control abatement practices.

2.4.8 Ensure staff is adequately trained on proper procedures and actions to address potential discharge of pollutants into the MS4 as a result of any construction activity. The Responsible Personnel Certification on-line training course through MDE must be made available to appropriate staff.

The MDTA encourages certification of construction inspectors, contractors, engineering designers, and maintenance staff in MDE's Responsible Personnel Certification (RPC).

Construction management and inspection staff, who provide construction oversight, oversee project compliance with ESC plan approval conditions, and perform construction inspection activities, are required to have the RPC. As of FY 2024, 33 MDTA employees, who serve in project CMI teams, have MDE's RPC. A list of the MDTA personnel with MDE's RPCs is provided in **Appendix D.2**.

2.4.9 Coordination with Other Entities.

The MDTA coordinates with Anne Arundel County Soil Conservation District and the Chesapeake Bay Critical Area Commission, who have regulatory authority on construction activities in defined zones within the State. The MDTA also coordinates with other TBUs through regular collaboration meetings. Recent meetings between SHA PRD and the MDTA have included information sharing sessions to discuss implementing requirements of the 20-CP General Permit, performing required erosion and sediment control inspections, and managing and tracking grading permits.

2.4.10 MCM implementation cost over the Permit term

The MDTA anticipates spending approximately $12,600,000 over the permit term implementing this MCM.

2.5 MCM No. 5 - Post Construction Stormwater Management

2.5.1 Submit stormwater management plans to MDE (or other authority when applicable) for review and approval in accordance with COMAR and with the Maryland Stormwater Management Erosion and Sediment Control Guidelines for State and Federal Projects (February 2015) for compliance with State stormwater management requirements.

Plans for the MDTA projects with stormwater management requirements are submitted to MDE for review and approval.

2.5.2 Implement the principals, methods, and practices found in the latest version of the 2000 Maryland Stormwater Design Manual, Volume I & II (Manual), and the latest version of MDE's Maryland Stormwater Management Guidelines for State and Federal Projects. This includes that environmental site design (ESD) be implemented to the maximum extent practicable (MEP).

For the MDTA development and redevelopment projects, stormwater design activities follow MDE's *Maryland Stormwater Management and Erosion and Sediment Control Guidelines for State and Federal Projects*, dated February 2015, and include stormwater management design that complies with the *2000 Maryland Stormwater Design Manual, Volumes I and II*, including the updated Chapter 5 of the manual. The MDTA incorporates ESD requirements to the maximum extent practicable.

2.5.3 Maintain stormwater program implementation information and provide updates in accordance with the MS4 Progress Report that include:

a) Total number of plans submitted to MDE for review and approval,

b) Total number of as-built plans submitted to MDE and approved, and

c) Verification that BMPs are maintained in accordance with MDE requirements outlined on approved plans.

During FY 2023 and FY 2024, design plans for 46 projects were submitted to MDE. As-built plans for 15 projects were submitted to MDE and 10 were approved.

Once approved by MDE, as-built plans are kept by the MDTA as the official record for a BMP. Relevant data from the plans are populated in the MDE-required Urban BMP Database. The MDTA maintains an internal NPDES geodatabase to track BMP inventory and maintains BMPs through regular inspections and remedial maintenance.

- **Inventory** - The MDTA maintains a comprehensive inventory of stormwater BMPs and drainage systems. The MDTA continually updates stormwater infrastructure data as new

stormwater features are constructed or existing assets are enhanced as part of the MDTA projects. The MDTA also tracks proposed BMPs scheduled for construction, such as those for development projects and for stormwater retrofits that address Chesapeake Bay TMDL restoration requirements. Inventory data are based on design documents, construction plans, and as-built plans, and on aerial imagery and field inspections as-needed. These data are stored in the MDTA's NPDES geodatabase, which includes spatial and attribute data and connectivity between stormwater features. The BMP inventory is linked with design documents, impervious area treatment and drainage areas, and Chesapeake Bay tributaries. The BMP inventory expands annually, based on:

- Continual review and update of BMPs based on property boundaries that would identify BMP ownership; and
- Preliminary evaluation of the MDTA-owned stormwater pond embankments to confirm dam hazard class.

Table 3 lists the inventory of constructed ("active") BMPs by major BMP type and the MDTA facility.

Table 3: BMP Inventory Summary

MDTA Property	Pond	Filtering	Infiltration	Other	Total
FMT	3	4	-	-	**7**
BHT	6	48	-	10	**64**
TJH	-	-	1	-	**1**
ICC	40	139	42	36	**257**
JFK	36	186	11	27	**260**
FSK	4	20	-	7	**31**
WPL	1	5	2	33	**41**
HWN	-	2	1	-	**3**
PB	-	3	-	-	**3**
Total	**90**	**407**	**57**	**113**	**667**

The MDTA continued to inventory impervious areas MDTA-wide in the NPDES geodatabase. This database tracks information such as impervious area type (e.g., building versus roadway) and MDE site development designation (redevelopment or new development). In addition, the MDTA tracks stormwater features by watersheds of Chesapeake Bay tributaries. This is a proactive approach to tracking stormwater retrofit efforts that addresses Chesapeake Bay TMDL requirements.

- **Inspection –** BMPs are inspected at regular intervals, triennially. These inspection records are available in digital form at each MDTA facility.

Inspections are performed using the MDTA's inspection protocol described in *Stormwater Best Management Practices Field Inspection Manual* (January 2017). The inspections evaluate performance and overall stability of BMPs. Overall ratings of A through E are assigned, where:

- **A** – BMP is performing as designed, with no signs of impending deterioration.
- **B** – BMP is functioning and has minor issues and is a potential candidate for maintenance.
- **C** – BMP is operational but has moderate problems. Remedial action may be needed to restore performance and/or stability.
- **D** – BMP is not functioning properly and has major problems. Key parameters are compromised and may require remedial action(s). The BMP may be a potential candidate for major repair or rehabilitation.
- **E** - BMP is not functional and has significant problems. BMP deterioration may require temporary stabilization or comprehensive remedial action(s), or both. The BMP may require emergency action, restoration, enhancement, or replacement.

As necessary remedial actions are identified, then work orders are executed, and inspections are performed afterwards to track the improved condition. The MDTA also has identified BMPs for enhancement to improve SWM to current standards. Where warranted, the MDTA performs detailed assessments after inspections to further evaluate individual BMPs or a specific BMP type. Inspections are tracked in the NPDES geodatabase, which includes field photos. Inspection dates are also updated in the Urban BMP Database submitted to MDE.

Applicable BMPs are inspected triennially in accordance with the Dam Inspection Checklist in Maryland Pond Code 378. **Table 4** summarizes the most recent ratings from BMP inspections, including ratings from inspections conducted during FY 2023 and FY 2024. During FY25, 266 BMPs are scheduled for inspection.

Table 4: BMP Inspection Ratings Summary

BMP Type	FY	A	B	C	D	E	Total
Pond	FY 2023	-	21	14	5	-	**40**
Filtering	FY 2023	8	53	18	5	-	**84**
Infiltration	FY 2023	2	29	4	2	-	**37**
Other	FY 2023	19	30	7	2	1	**59**
Total	***FY 2023***	***29***	***133***	***43***	***14***	***1***	***220***
Pond	FY 2024	1	9	8	2	1	**21**
Filtering	FY 2024	65	67	10	3	-	**145**
Infiltration	FY 2024	4	7	-	1	-	**12**
Other	FY 2024	1	1	1	-	-	**3**
Total	***FY 2024***	***71***	***84***	***19***	***6***	***1***	***181***
Grand Total	**FY 2023 and FY 2024**	**100**	**217**	**62**	**20**	**2**	**401**

- **Maintenance** - The MDTA continually conducts maintenance for BMPs requiring action. Work orders (WOs) for major maintenance and rehabilitation include remedial action lists, site maps annotated with remedial actions, photographs identifying defects, and details and specifications. In addition, enhancement WOs are issued for poorly performing BMPs. BMP maintenance and repair is tracked in the internal NPDES geodatabase to manage activities for progress and cost as well as to aid in forecasting future remediation. Maintenance checklists are available to MDE during field review if requested. **Table 5** summarizes the remedial activities performed during the past two reporting years.

Table 5: BMP Maintenance Activities Summary

Maintenance Type	FY	Pond	Infiltration	Filtering	Other	Total
Preventative	FY 2023	90	-	407	-	**497**
Minor Repair	FY 2023	3	-	61	1	**65**
Major Repair	FY 2023	3	-	2	-	**5**
Rehabilitation	FY 2023	-	-	-	-	**-**
Enhancement	FY 2023	-	-	-	-	**-**
Total	***FY 2023***	***96***	***0***	***470***	***1***	***567***
Preventative	FY 2024	90	-	407	-	**497**
Minor Repair	FY 2024	9	5	18	8	**40**
Major Repair	FY 2024	-	-	-	-	**-**
Rehabilitation	FY 2024	-	-	-	-	**-**
Enhancement	FY 2024	-	-	-	-	**-**
Total	***FY 2024***	***99***	***5***	***425***	***8***	***537***
Grand Total	**FY 2023 and FY 2024**	**195**	**5**	**895**	**9**	**1,104**

  - Preventative Maintenance - Engineering staff work closely with maintenance staff in coordinating preventative (routine) BMP maintenance. The MDTA continually updates stormwater BMP maintenance manuals for each facility and the GIS enterprise. This provides maintenance staff with the current inventory of BMPs for their facility and the typical maintenance activities by BMP type. A sample maintenance manual is provided in **Appendix E.1**. Maintenance is also performed in accordance with the procedures detailed on MDE-approved plans. Proper techniques will prolong the service life of BMPs, minimize damage, maintain access to critical components (e.g., risers, inflow structures), and reduce the opportunity for invasive or noxious vegetative growth.
  - Repair and Rehabilitation - Minor repairs include phragmites management and WOs for maintenance staff to address minor issues observed during inspections. Major repair and rehabilitation require more significant WOs typically performed by stormwater contractors. Several BMP repairs WOs were prepared in FY 2024. In FY 2023 and FY 2024, inspections revealed a variety of defects requiring action performed by the MDTA maintenance staff, including:

- Forty-eight (48) BMPs required mowing. These BMPs had their side slopes mowed and excessive turf growth more than 6 inches trimmed.
- Fifty-four (54) BMPs required trash and debris from within and around their footprints.
- Forty-five (45) BMPs needed invasive/noxious vegetation control, which included removal of phragmites and other invasive vegetation. These BMPs were sprayed, and the phragmites were mechanically removed.
- Fifty-five (55) BMPs required vegetation management, such as removing woody vegetation surrounding control structures, inflow structures, outflow structures, within the BMP, on adjacent side slopes trimming unwanted vegetation, and maintaining access to each BMP.
- Twenty-six (26) BMPs required sediment and debris removal, specifically within their footprints, stone windows, and control structures.
- Forty (40) BMPs required inflow stabilization at the outfall of inflow pipes, inflow channels, weir over-flows, and outfalls. This also included stabilization adjacent to edge of roadways, side slopes, and check dams. Stabilization methods included placement or redressing of stone or riprap.
- Thirty-one (31) BMPs required site stabilization, specifically of eroded or exposed areas. Stabilization typically occurred with 4-inch topsoil, seed & mulch, and Type A soil stabilization matting.
- Six (6) BMPs required impoundment maintenance, specifically the repair of eroded areas, replacement of surface media as needed, and dewatering of BMPs where ponding was excessive.
- Thirty-five (35) BMPs required underdrain/outlet maintenance. This consisted of control structures, low-flow pipes, or underdrains to be cleaned and/or repaired.
- Five (5) BMPs required landscape replacement and supplementation.
- Five (5) BMPs required major repair delivered by an on-call contractor.

2.5.4 Provide training to stormwater program staff and to staff responsible for proper BMP design, performance, inspection, and routine maintenance. Report the number of trainings offered, topic covered, and number of attendees.

The MDTA provides annual or semi-annual training for staff on BMP design, inspections, and maintenance. These trainings were offered on 12/8/2023, 1/26/2024, 2/28/2024, 4/2/2024, 5/13/2024, 6/4/2024, and 6/11/2024. Inspections teams are trained annually. In FY 2023 and FY 2024, 38 employees were trained. In addition, Stormwater BMP Maintenance Manuals have been developed for each facility. An example of one of the manuals is included in **Appendix E.1**. Additionally, the Drainage Remediation Team also provides WOs to the MDTA

maintenance staff on smaller, lower priority issues to develop the construction expertise of facility crews.

2.5.5 Maintain and submit the Urban BMP Database in accordance with the database structure in Appendix B, Tables B.1.a, b, and c. This information shall be submitted to MDE with annual reports.

The MDTA submitted an Urban BMP Database as part of the impervious area reporting requirements to MDE. This database is derived from the MDTA's NPDES geodatabase that includes BMPs, storm drain systems, drainage areas, impervious surfaces, natural resources, asset inspections, and remedial actions to meet MDE's database requirements. The MDTA manages spatial and attribute data related to inventory, inspections, remediation, and illicit discharge screening. The geodatabase has tables which link supporting information, such as site photos, defect photos, design documents, and remedial WOs to features.

The stormwater data is readily accessible to staff via an enterprise GIS system. This helps information sharing, eliminates multiple versions of the same data, facilitates the decision-making process, and allows additional quality control (QC) procedures to be applied to the data input in the enterprise geodatabase.

The MDTA is also using Environmental Systems Research Institute's (ESRI) ArcGIS Online platform to share data among stormwater-specific staff. This platform offers a user interface, data visualization, and data management. BMP inspection ratings are located on a dashboard. To improve data integrity and efficiency in field collection of data, the MDTA uses ESRI's ArcGIS Collector application for BMP inspections and IDDE investigations and Survey123 for SWPPP inspections.

2.5.6 Summary of activities planned for the next reporting cycle.

The MDTA will use program funding to continue BMP inspections and maintenance, to update the MDE-required Urban BMP Database, and to train employees in inspections and maintenance.

2.5.7 MCM implementation cost over the permit term

The MDTA anticipates spending approximately $9,000,000 over the permit term implementing this MCM.

2.6 MCM No. 6 - Pollution Prevention and Good Housekeeping

2.6.1 Ensure that appropriate staff and contractors receive training at least annually. Topics must include spill prevention and response, proper disposal of waste, and periodic visual inspections to detect and correct potential discharges at properties owned or operated by the permittee.

The MDTA employees are trained annually in spill prevention and response, proper waste disposal, and inspection of discharges during SWPPP training. Committee members and staff at

maintenance facilities are trained annually on the SWPPP contents and the procedures for good housekeeping and for routine inspections of their facility. As part of good housekeeping training, the MDTA employees learn how to use the EMS and the Enterprise Environmental Information Management System (EEIMS), developed by OEC and OESRM. The compliance-focused EMS was developed as a tracking tool. The EMS manages environmental performance and compliance with environmental regulations. OESRM oversees the EMS program, and the EMS compliance audits at maintenance facilities. The EEIMS was created to track and document compliance progress.

The MDTA provided annual SWPPP training to 279 employees in FY 2023 and 254 employees in FY 2024. Copies of the training materials are provided in **Appendix A.3** and **Appendix A.4**.

2.6.2 Develop, implement, and maintain a good housekeeping plan for permittee owned or operated properties where any of the following activities is performed: maintenance of vehicles or heavy equipment, and handling of any of the following materials: deicers, anti-icers, fertilizers, pesticides, road maintenance materials such as gravel and sand, or hazardous materials. A standard plan may be created to address multiple properties where similar activities are conducted, provided the below items are addressed. The plan must include:

a) **A description of site activities,**

b) **A list of potential pollutants including their sources and locations on the site. The plan must consider conveyance of stormwater entering, flowing across, and leaving the site,**

c) **Written good housekeeping procedures designed to prevent discharge of pollutants off site that include regular visual inspections to detect potential discharges,**

d) **Written procedures for corrective actions to address any release, spill or leak on site, and**

e) **Documentation for any discharge, release, leak, or spill, including date, findings, and response actions.**

Industrial activities, as defined by MDE in the 20-SW General Permit, are performed at the MDTA's Operation and Maintenance complexes. Eleven (11) facilities have been identified as requiring coverage under the 20-SW General Permit. NOIs for coverage under the 20-SW General Permit have been submitted for the 11 maintenance facilities, presented in **Table 6** below, and registration letters with updated permit numbers have been received for them.

Table 6: MDTA Facilities with 20-SW General Permits

MDTA Property/ Facility	Registration #	Municipality
I-95 (John F. Kennedy Memorial Highway/ JFK):		
JFK Maintenance Facility #1	20SW2042	Harford Co.
JFK Maintenance Facility #2	20SW2043	Cecil Co.
Truck Weigh and Inspection Station	20SW2043	Cecil Co.
U.S. 40 over Susquehanna River (Thomas J. Hatem Memorial Bridge/ TJH):		
TJH Maintenance Facility	20SW2048	Cecil Co.
I-95 and I-395 (Fort McHenry Tunnel/ FMT):		
FMT Maintenance Facility	20SW2046	City of Baltimore
I-895 (Baltimore Harbor Tunnel Thruway/ BHT):		
BHT Maintenance Facility	20SW2045	City of Baltimore
I-695 (Francis Scott Key Bridge/ FSK):		
FSK Maintenance Facility	20SW2050	Baltimore Co.
U.S. 50 over Chesapeake Bay (William Preston Lane Memorial Bridge/ WPL):		
WPL Maintenance Facility	20SW2047	Anne Arundel Co.
U.S. 301 over Potomac River (Harry W. Nice Memorial/Senator Thomas “Mac” Middleton Bridge/ HWN):		
HWN Maintenance Facility	20SW2049	Charles Co.
MD 200 (Inter County Connector/ ICC):		
ICC – East Operations Maintenance Facility	20SW2415	Prince George’s Co.
ICC – West Operations Maintenance Facility	20SW3395	Montgomery Co.
Point Breeze/ PB		
(No separate maintenance facility)	N/A	-

All SWPPPs were updated to comply with conditions of the 20-SW General Permit. Each plan documents the prevention activities and provides a list of potential pollutants; a map of the storm drainage system, including outfalls; descriptions of the existing BMPs; and recommended good housekeeping activities. The SWPPPs also provide site-specific information such as operating procedures, list pollution prevention committee members and their roles, and provide schedules for site inspections and outfall testing. The SWPPPs are updated annually to reflect changes in the site or operations. In 2016, SWPPP-related documents also were created for the I-95 Chesapeake House and Maryland House travel plazas, although the MDTA is not required to have permit coverage for these two sites.

The MDTA also conducts routine inspections every quarter and conducts annual comprehensive SWPPP inspections at all maintenance facilities to review the potential pollutant-generating activities, site conditions, and effectiveness of the BMPs. Findings from each quarter’s SWPPP inspections are summarized and remedial actions are identified as needed. With the quarterly inspections, issues can be quickly identified and remediated before a larger issue arises. As required by the 20-SW General Permit, the MDTA also performs

quarterly visual monitoring at outfalls of the maintenance facilities during a rain event or snowmelt. These forms are also uploaded to EEIMS. Copies of inspection forms as well as a paper copy of the SWPPP are kept in or near the office of the Chief Facility Maintenance Officer at each facility. These records are also maintained by the Environmental Engineering Division and are readily available in case of a field review by MDE.

The MDTA maintains a record of all spills, leaks, discharges, and releases via EEIMS as part of the SWPPP. These spills are also documented on the SWPPP maps. **Table 7** summarizes all accidental releases recorded during FY 2023 and FY 2024.

Table 7: Accidental Releases

MDTA Property	FY	Date of spill	Observations	Response
FMT	FY 2023	1/9/23	*Parking lot:* 4 Gallons of hydraulic oil spilled, did not affect soil or water.	Absorbent used to clean spill.
JFK	FY 2023	2/22/23	*MM 92.4 SB:* Tractor Trailer punctured its diesel tank, diesel spill reached soil.	MDE and Fire Dept cleaned spill.
JFK	FY 2023	3/1/23	*MM 99.7 SB:* MDTA dump truck leaked 20 gallons of hydraulic fluid.	Cleaned with stay dry, booms, sand.
JFK	FY 2023	3/6/23	*MM 92.7 SB:* Oil cap fell of a Tractor trailer and 30 gallons of motor oil spilled, Soil effected.	Absorbent used to clean up, MDE involved in clean up.
JFK	FY 2023	4/19/23	*MM 73.7 NB:* Damaged tank on tractor trailer spilled 100 gallons of Diesel.	Absorbent placed in front of storm drain, MDE involved in clean up.
BHT	FY 2023	5/12/23	Fuel Island: 4 gallons of diesel spilled.	Absorbent used for cleanup.
WPL	FY 2023	5/24/23	*Bay Bridge gateway 8, US 50:* 2.5 gallons of diesel spilled during accident.	Absorbent, booms, and street sweeper used for cleanup.
HWN	FY 2023	6/22/23	*1.0 Northbound on bridge:* Leaking forklift, spilled 2.5 gallons of hydraulic fluid.	Absorbent used for cleanup.
JFK	FY 2023	7/27/23	*MM 92.8 NB:* 22 gallons of diesel spilled from tractor trailer, Millings impacted, MDE and Fire department called.	Absorbent and sweeper used for cleanup.
WPL	FY 2023	8/7/23	*Admin parking lot:* Dump truck leaked 3.5 gallons of hydraulic fluid.	Absorbent, pig mats and booms used for cleanup.
WPL	FY 2023	8/11/23	*Eastbound pier #35:* 1 gallon of high-solid polyurethane paint dropped into surface water.	Spill dissipated in a matter of minutes, not enough time to effectively prevent paint from dissipating.
WPL	FY 2023	8/21/23	*Eastbound scale house:* Truck leaked 3 quarts of motor oil.	Absorbent used for cleanup.
WPL	FY 2023	9/2/23	*Contractor parking lot:* 1-2 gallons of diesel, 3 quarts of oil spilled.	Absorbent used for cleanup.
WPL	FY 2023	9/28/23	*Tolls parking lot:* 2 qrts of transmission fluid leaked.	Absorbent used for cleanup.

MDTA Property	FY	Date of spill	Observations	Response
JFK	FY 2023	9/30/23	*61.4 Southbound:* Trailer leaked less than 16 quarts of oil and coolant.	Sand and sweeper used for cleanup.
WPL	FY 2023	10/19/23	*911 Parking Lot:* 1 gallon of antifreeze leaked into parking lot.	Absorbent used for cleanup.
JFK	FY 2023	11/29/23	*91.6 NB:* Punctured fuel tank, leaked less than 3 gallons of diesel.	Cecil County fire and Havre de Grace fire, Cecil County Hazmat, and responsible driver managed cleanup.
JFK	FY 2023	12/5/23	*Chesapeake House:* 30 gallons of Diesel leaked from truck during accident.	Absorbent and sweeper used for cleanup.
JFK	FY 2023	12/11/23	*SB ramp:* Tractor trailer leaked less than one gallon of motor oil.	Absorbent used for cleanup.
JFK	FY 2023	12/29/23	*69.9 SB right shoulder:* Tractor trailer leaked 7 gallons of motor oil; soil impacted.	Absorbent used for cleanup, Fire dept involved in cleanup.
JFK	FY 2024	2/21/24	*NB Inspection Lot:* Truck leaked 10 gallons of oil.	Absorbent and sweeper used for cleanup.
JFK	FY 2024	3/1/24	*MM 97.3:* Accident caused less than 1 gallon of coolant to spill.	Absorbent used for cleanup.
JFK	FY 2024	3/11/24	*MM 108.5:* Overturned car leaked less than 3 gallons of fuel and coolant.	Absorbent used for cleanup.
WPL	FY 2024	3/18/24	*Fuel Island:* 1-2 quarts of motor oil and transmission fluid leaked from delivery truck.	Cardboard and absorbent used to cleanup spill.
JFK	FY 2024	4/10/24	*MM 67.2 SB:* Truck spilled animal guts on roadway	Trucking company managed spill clean up
JFK	FY 2024	4/23/24	*MM 107.2 SB:* Driver leaked less than 5 gallons of oil.	Absorbent used for cleanup.
JFK	FY 2024	4/25/24	*MM 92.9 SB:* More than 20 gallons of oil were spilled into soil.	Contaminated soil and millings were excavated, and replaced with new soil, covered with grass seed.
JFK	FY 2024	4/27/24	*MM 71:* 50 gallons of diesel spilled during accident; soil impacted.	MDE involved with cleanup.
JFK	FY 2024	5/1/24	*MM 92.8:* 5 gallons of fuel/coolant/oil spilled and reached soil.	Saturated soil removed and replaced; absorbent used to clean spill on roadway.
JFK	FY 2024	5/20/24	*MM 80:* 80 gallons of diesel fuel spilled, impacting soil and water.	Absorbent and Booms used for cleanup on roadway, truck driver's insurance handled cleanup for soil and water, MDE involved.
JFK	FY 2024	6/4/24	*MM Chesapeake House:* 10 gallons of oil spilled in parking lot.	Absorbent and sweeper used for cleanup.
JFK	FY 2024	6/12/24	*MM 88.8 NB:* 40 gallons of Diesel fuel leaked on roadway.	MDE managed cleanup.
JFK	FY 2024	6/18/24	*MM 81.8:* 7 gallons of motor oil leaked.	Absorbent and sweeper used for cleanup.

MDTA Property	FY	Date of spill	Observations	Response
JFK	FY 2024	7/3/24	*MM 85.1 NB:* Oil leaked on roadway and into soil, unsure of quantity.	No info on report.
JFK	FY 2024	7/8/24	*MM 85.6 to 84.9:* 10 gallons of motor oil leaked into soil.	Absorbent and sweeper used for cleanup.

2.6.3 Quantify and report pollution prevention efforts related to the following activities:

a) Number of miles swept, and pounds of material collected from street sweeping and inlet cleaning programs, as applicable.

The MDTA conducts street sweeping and inlet cleaning at maintenance facilities and along highways. These activities prevent pollutants from reaching nearby water bodies. Sweeping machines and vacuum trucks systematically remove sediment and debris, which is then dewatered and temporarily stored at the MDTA maintenance facilities before it is hauled off-site for proper disposal.

The MDTA prioritizes street sweeping in areas that accumulate high volumes of pollutants such as intersections, exits, and roadway shoulders. Bridges are also given high priority due to the drains and accumulation around barrier walls. Other roadways and parking lots are also swept, though may be swept less frequently than high pollutant potential areas. Some of the MDTA facilities try to sweep in the evenings when traffic volumes are lower or there are road closures.

Records are kept on the total amount of waste removed. **Table 8** lists the weight of road sweeping debris collected in FY 2023 and FY 2024.

Table 8: Summary of Street Sweeping and Sediment Disposal

MDTA Property	FY 2023			FY 2024		
	Miles Swept	Inlets Cleaned[1]	Tons removed[2]	Miles Swept	Inlets Cleaned[1]	Tons removed[2]
JFK	200	-	165	200	-	97
FMT	30	-	415	30	-	226
BHT	70	-	89	70	-	49
ICC	77	-	181	77	-	85
WPL	21	-	30	21	-	24
FSK	41	-	28	41	-	15
Total	**439**	**-**	**907**	**439**	**-**	**496**

[1] Inlets cleaned are not tracked separately from street sweeping of roadways. Total tons removed includes debris removed from inlets.

[2] The MDTA tracks the mass of sweeper waste removed from both street sweeping and inlet cleaning collectively.

b) Good housekeeping methods for pesticide application such as integrated pest management plans or alternative techniques.

The MDTA does not employ staff certified to apply pesticides. All pesticide application is performed by a contractor with the required pesticide applicator license. The MDTA employs the following procedures when applying herbicides:

- Follow instructions on herbicide packaging related to mixing, application, and storage.
- Keep spill kits nearby when transferring or mixing herbicides.
- Keep application equipment clean and free of chemical buildup.
- Apply herbicides only in dry weather.
- Never mix, apply, or store herbicides near a storm drain.

The MDTA uses staff with required certification on the above-listed activities. **Table 9** lists the employees and facilities where they are located.

Table 9: MDTA Employees with Herbicide Application Certification

MDTA Property/ Facility	Certified Employee
I-95 (John F. Kennedy Memorial Highway/ JFK)	
JFK Maintenance Facility #1	Ricky Gibson
JFK Maintenance Facility #2	Jim Grove and Charles Marcum
Truck Weigh and Inspection Station	Jim Grove and Charles Marcum
U.S. 40 over Susquehanna River (Thomas J. Hatem Memorial Bridge/ TJH)	
TJH Maintenance Facility	Jim Grove and Charles Marcum
I-695 (Francis Scott Key Bridge/ FSK)	
FSK Maintenance Facility	John Monk
I-895 (Baltimore Harbor Tunnel Thruway/ BHT)	
BHT Maintenance Facility	Robert Lowe
I-95 and I-395 (Fort McHenry Tunnel/ FMT)	
FMT Maintenance Facility	Sherri Michael – currently on extended leave

c) Good housekeeping methods for fertilizer application such as chemical storage, landscaping with low maintenance/native species, and application procedures.

The MDTA follows good housekeeping practices when applying fertilizers. These procedures include:

- Follow instructions on fertilizer packaging related to mixing, application, and storage.
- Keep spill kits nearby when transferring or mixing fertilizers.
- Never apply fertilizers to frozen ground.

- Keep application equipment clean and free of chemical buildup.
- Apply fertilizers only in dry weather.
- Never mix, apply, or store fertilizers near a storm drain.

d) Good housekeeping methods for snow and ice control such as use of pretreatment, truck calibration and storage, and salt dome storage and containment.

The MDTA follows good housekeeping practices when applying snow and ice control materials. These procedures include:

- Minimize spills by not overloading salt spreading trucks and equipment.
- Use the least amount of salt necessary to achieve safe walking/driving conditions.
- Store salt in a covered dome with barriers blocking the exit to prevent migration of salt outside where it can encounter stormwater.
- Establish snow storage areas that are not located near storm drains. Ideal snow storage areas are located on pervious areas where snowmelt can infiltrate.
- Sweep excess salt and sand from paved areas after the last snow.

e) Other good housekeeping methods performed by the permittee not listed above.

The MDTA follows standard operating procedures for Waste Disposal. The MDTA staff deposit waste in the appropriate receptacle (recycling bin or trash can). Housekeeping personnel remove materials from interior receptacles and place them in vendor-provided containers located outside. A vendor collects material from the external containers on each campus. Hazardous waste disposal, including disposal of universal waste, follows established SOPs. Street sweeping waste is placed into covered piles or dumpsters at the facilities that store sweeper waste.

2.6.4 Submit in the NOI a list of properties owned or operated by the permittee where the activities listed in this MCM are performed and indicate which are covered under the Maryland General Permit for Stormwater Discharges Associated with Industrial Activity. Provide an update in annual reports if the status of industrial activity permit coverage changes for any property.

The MDTA has submitted NOIs and maintains active coverage for its facilities. The processes and procedures designed to meet the permit requirements are followed in operation of the facilities and SWPPPs continue to be updated per permit conditions. The list of MDTA facilities with 20-SW General Permit coverage is provided in **Table 6**.

2.6.5 MCM implementation cost over the permit term

The MDTA anticipates spending approximately $1,040,000 over the permit term implementing this MCM.

Appendix A: MCM No. 1 - Public or Personnel Education and Outreach Supporting Documentation

Appendix A.1 - Earth Day Fact Sheets

MDTA
Maryland Transportation Authority

What is MDTA doing to protect Maryland's waters?

Testing Stormwater Runoff



Planting Trees



Sweeping Roads and Parking Lots



Installing Green Practices to Treat Stormwater



Educating employees about stormwater pollution



Stenciling Storm Drain Inlets



Maryland Transportation Authority

Stormwater Pollution Prevention Plan (SWPPP) Inspections

What is the annual SWPPP inspection?

You may have noticed people walking around your site recently. Each MDTA facility has a SWPPP, which tells us what potential pollutants could be at the site and what MDTA is doing to prevent them from getting into the stormwater runoff. A SWPPP inspection is performed annually at each MDTA facility to identify changes at the site or problems to fix. A SWPPP is required by MDTA's Stormwater Discharge Permit issued by MDE.

Why is the SWPPP inspection important?

By conducting annual SWPPP inspections, MDTA is keeping track of areas on our sites that have the potential to pollute Maryland waters like the Chesapeake Bay and our local streams. MDTA maintains these areas to keep employees safe and to prevent any leaks or spills from occurring.

What do the inspectors look for?

During the annual inspection, inspectors walk around with the SWPPP and the site map, which shows the pollutant sources on site. The inspectors compare the pollution controls listed in the SWPPP to the map and the site conditions and recommend changes if the controls aren't working properly.



Stained pavement



Damaged salt dome

What does MDTA do after an inspection?

Based on the results of an inspection, MDTA corrects any problems, and makes changes to the SWPPP and map to reflect site conditions. MDTA also performs maintenance on items identified as being in poor condition during the inspection. Once the plan is updated and maintenance is conducted, MDTA documents the work in case MDE performs their own inspection.



Cloggged stormdrain inlet



Excessive trash



Properly Functioning Stormwater Management Pond

MDTA
Maryland Transportation Authority

Why should we care about water quality? What can we do about it at home?

Water quality impacts a variety of living things, including animals, bugs, plants, and humans. So, water pollution can affect YOUR quality of life.

Here are several activities that may be impacted by polluted water:

- Boating – water may smell badly due to dead fish or rotting vegetation, and your boat can be damaged by floating or partially submerged debris
- Fishing – fish and other aquatic life may die or could be too sick for humans to eat
- Crabbing – crabs can die when their habitats become clogged with sediment
- Swimming – the water may smell badly or make swimmers sick

If you want to do your part in preventing polluted stormwater runoff from reaching the Bay, here are some things you can do at home:

- Wash your car on the grass or at a car wash
- Collect rainwater using rain barrels and reuse water in your garden
- Plant a rain garden to filter water and attract pollinators like butterflies and bees
- Manually pull weeds instead of using herbicides


Car wash


Rain barrels

- Conduct car maintenance in your garage and use drip pans and absorbent to contain any spills before they reach the storm drain
- Only allow rain down the drain - do not dump oil, grease, trash, or cigarette butts into your neighborhood storm drain
- Properly dispose your trash and recycling


Rain garden


Pulling weeds


Car maintenance in garage



Only Rain Down the Storm Drain



Properly dispose of trash and recycling

Tell a friend! Spread the word about stormwater pollution prevention

Illicit Discharge Detection and Elimination (IDDE) Testing

Maryland Transportation Authority

What is an illicit discharge?

An illicit discharge is any contaminated flow into or out of a storm drain that occurs during a period of dry weather. Storm drains are meant for stormwater, so if it isn't raining, they should be dry!

What causes an illicit discharge?

An illicit discharge could be caused by a variety of sources, such as a bad pipe connection (i.e. sewer), a spill, or illegal dumping of liquids.



Illicit discharge

What is IDDE Testing?

IDDE Testing is required annually by MDTA's stormwater permit issued by MDE. Stormwater testers travel around MDTA's highways, roadways, and sites during dry weather to check storm drains for flow. If there is flow, the water is tested for a variety of contaminants like detergent, chlorine, and sediment.



Water testing and sampling

What should you do if you see an illicit discharge?

If you see water flowing from a storm drain during dry weather, take note of the smell and color of the discharge. If possible, take pictures and note any other details. Then, notify Joyce Rebar at jrebar@mdta.state.md.us with the information you have gathered. OESRM will investigate and eliminate the discharge



Illegal Dumping

Appendix A.2 - SPCC Training

SPILL PREVENTION, CONTROL, and COUNTERMEASURE (SPCC) / GENERAL SPILL RESPONSE

Maryland Transportation Authority
Office of the Environment, Safety, and Risk Management (OESRM)
2023

This training is provided in general accordance with 40 CFR 112 Section 311(j)(1)(C) of the Clean Water Act as amended by the Oil Pollution Act of 1990

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Things to remember…

- Contact OESRM for copies of information from today
- Turn off or silence cell phones
- STAY AWAKE!
- Please participate



2

Today's Discussion

- What is the SPCC rule?
- Why are you here?
- SPCC Plan requirements
- General spill response information
- Resources
- Contact information

3

Did You Know?

- A single drop of solvent can contaminate 75,000 gallons of water
- Water is easy to contaminate but difficult and expensive to clean up
- Contaminated water deters new businesses and industry from buying properties/creating development

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Why Do I Need This Training?

Federal regulation requires **all** MDTA "oil-handling" personnel receive **annual** training:

- Basic understanding of pollution control rules and regulations
- Know the basics of your facility's SPCC Plan
- Know how to prevent discharges
- Know and follow discharge procedures
- Know where to find your facility's SPCC Plan

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Why are You Here?

- As part of your job, you:
  - Perform maintenance on vehicles or equipment containing oil
  - Utilize vehicles or equipment that contain oil
  - Pump or transfer oil to equipment or vehicles
  - Otherwise handle oil
  - Must know how to respond, if a spill/release occurs



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Does the SPCC Rule Apply to MDTA?

YES!

EPA's SPCC regulations apply to facilities with a reasonable expectation of a release to navigable waters of the U.S.

- More than 1,320 gallons above ground oil storage capacity

- or -

- More than 42,000 gallons "completely buried" storage capacity



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What's Considered "Oil" under this Rule?

- Fuel oil
- Petroleum products
- Sludge
- Oil refuse
- Oil mixed with other wastes
- Other oils, as defined



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SPCC Plan: Overview

MDTA facilities fall under the category of:
"Industrial… or public facilities using or storing oil"
So, an SPCC Plan is required.

Components of the SPCC Plan include:

- Operating procedures that prevent oil spills
- Control measures that prevent oil spills
- Countermeasures to contain, cleanup, and mitigate effects of spills

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SPCC Plan: Required Components

- Potential spill scenarios
- Engineering controls to prevent spills
- Procedures to prevent spills
- Training and recordkeeping requirements
- Inspection requirements
- Description of site security



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Potential Oil Spill Sources

Oil Storage Equipment

- Fixed Storage Containers and Piping
  - Aboveground Storage Tanks (ASTs)
  - Underground Storage Tanks (USTs)
- Small Quantity Storage
  - Drums (55 gallon or larger)



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Potential Oil Spill Sources

Oil Storage Equipment (cont'd)

- Portable Storage Containers
  - Bed tanks
  - Portable generators
- Oil Filled Operational Equipment (OFOE)
  - Transformers
  - Stationary generators
  - Vehicles
  - Heavy equipment



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SPCC Plan: Required Components

- Potential spill scenarios
- Engineering controls to prevent spills
- Procedures to prevent spills
- Training and recordkeeping requirements
- Inspection requirements
- Description of site security

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Potential Oil Spill Scenarios

Most oil spills occur during active operations

- Mechanical failure
  - Line break
- Container failure
  - Weathering/Degradation
  - Accidental impact



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Potential Oil Spill Scenarios

Most oil spills occur during active operations (cont'd)

- Oil and chemical handling/usage
  - Petroleum products
  - Non-hazardous waste
  - Hazardous materials
  - Hazardous waste
- Fuel transfers
  - Fuel delivery
  - Fueling vehicles or equipment



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SPCC Plan: Required Components

- Potential spill scenarios
- Engineering controls to prevent spills
- Procedures to prevent spills
- Training and recordkeeping requirements
- Inspection requirements
- Description of site security

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Engineering Controls & Prevention

Engineering Controls

- Overfill alarms and mechanisms
- Visual gauges
- Secondary containment
  - Required for liquids
- Protecting containers from weathering
  - Semi-permanent covering
  - Disposable covering
  - Maintaining indoors

Spill Prevention

- Sticking fuel tanks
- MDTA representatives present at fuel deliveries
- Keep containers/lids closed
- Use drip pans or deploy spill pads before leaks occur
- Pay attention while performing the operation
- Practice good housekeeping
- Follow established procedures

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Spill Prevention: Procedures

MDTA SOPs for Proper Materials Management	Located on the MDTA Intranet
Fuel Dispensing (vehicles and equipment)	S-OPS-ENVF-A-0014-01
Tank Gauging (over 2,000 gallons)	S-EHS-ENVF-A-0021
BHT Spill Response (tunnel thruway)	S-EHS-ENVM-0018
Notification of Spill	S-EHS-ENVF-U-0015
HVAC Recovery	S-EHS-ENVF-A-0009
Compressed Gas Cylinder Management	S-EHS-ENVF-A-0001
Hazardous Materials Management	S-EHS-ENVF-A-0002
Hazardous Waste Management	S-EHS-ENVF-A-0003
Universal Waste Handling	S-EHS-ENVF-A-0007
Fluorescent Bulb Crushing	S-EHS-ENVF-A-0020
Maintenance – Aerosol Can Management	S-EHS-ENVF-A-0026
Aerosol can Management Recycling	S-EHS-ENVF-U-0016
Motor Vehicle Refrigerant Recovery	S-EHS-ENVF-A-0005

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Spill Prevention: Fueling Operations

Contractor Deliveries

- Must occur during business hours
- Contractors **must** cleanup spills and overfills
  - Including product released to spill buckets
- MDTA personnel must remain with contractor
- MDTA must maintain fuel delivery receipts



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Spill Prevention: Fueling Vehicles

MDTA Employees fueling vehicles

- Remain outside vehicle and with the nozzle while fueling
- Use the "hold-open" latch provided on the fuel nozzle
  - **Do not** insert an object to keep in open position
- Turn pump off when finished **before removing nozzle** from vehicle



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Proper Fueling Procedures

- Activate system using FuelMaster and prokee
- Open fuel tank
- Remove nozzle from cradle
- Insert nozzle in fuel tank
  - Double check it's secure
- Flip lever to activate pump
  - DO NOT DO THIS BEFORE THE NOZZLE IS IN YOUR TANK
- Use latch on nozzle to dispense fuel

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Proper Fueling Procedures (cont'd)

- When nozzle clicks off, flip lever to deactivate pump
- DO NOT TOP OFF!
- Remove nozzle from tank
- Place nozzle back in cradle on dispenser



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Spill Prevention: Fueling Equipment

MDTA Employees must:

- Remain with the equipment while fueling
- Place portable equipment on the ground before fueling
- Fill portable containers/tanks to only 90% capacity
- Use the "hold-open" latch provided on the fuel nozzle
  - **Do not** insert an object to keep in open position
- Turn pump off when finished **before removing the nozzle** from the equipment

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Reminders: Fueling Operations

MDTA's Fuel Dispensing SOP:

- MDTA employees **SHALL NOT**:
  - Use cell phone while fueling
  - Smoke, light matches, or use lighters while fueling
  - "Top off" tanks or equipment
- MDTA employees **SHALL**:
  - Know the locations of spill kits at the facility
  - Know the location of the breaker box -- ASTs and USTs
- MDTA employees shall remain with vehicle or equipment while dispending fueling

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SPCC Mapping: JFK I Maintenance



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SPCC Plan: Required Components

- Potential spill scenarios
- Engineering controls to prevent spills
- Procedures to prevent spills
- Training and recordkeeping requirements
- Inspection requirements
- Description of site security

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Training and Recordkeeping

- Training
  - Required every year
- SPCC Plan updates required
- Records maintained in accordance with *Standardized Environmental Recordkeeping* SOP
  - Inspection records
  - Training records
  - Testing records/data

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SPCC Plan: Required Components

- Potential spill scenarios
- Engineering controls to prevent spills
- Procedures to prevent spills
- Training and recordkeeping requirements
- Inspection requirements
- Description of site security

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Inspections

- Inspection of oil containers (by facility)
  - Must be performed weekly
  - CFMO designates employee to conduct inspections
  - Follow SOP: Routine Facility Environmental, Health and Safety Inspections # S-OPS-ENVF-A-0012-02
    - Use attached checklist
    - Must be uploaded to EEIMS
  - Report deficiencies to OESRM
  - Restock spill kits, as necessary
    - Contact OESRM for budget item
- Quarterly (by OESRM)

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Testing & Monitoring

- Third Party activities
  - ASTs and USTs are monitored at regular intervals to prevent releases
  - USTs and ASTs are tested by certified personnel
- MDTA activities
  - Tank gauging (weekly) – follow SOP
  - Sticking tank to detect water (monthly)



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SPCC Plan: Required Components

- Potential spill scenarios
- Engineering controls to prevent spills
- Procedures to prevent spills
- Training and recordkeeping requirements
- Inspection requirements
- Description of site security

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SPCC Plan: Site Security

- MDTA facilities are equipped with the following security measures:
  - Restricted/Locked site access to campus (some facilities)
  - Video surveillance
  - Fill ports on ASTs and USTs are pad locked
  - Hazardous waste storage areas are pad locked
  - Hazardous materials stored indoors
    - MDTA buildings require badge access (generally)
    - Contractors and visitors are escorted by MDTA personnel

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Kahoot! knowledge check

Option 1:	Option 2:
	Connect to MDTA WiFi "Visitor"
Connect to MDTA WiFi "Visitor"	Access web browser
Download Kahoot! app	Go to www.kahoot.com
Enter Game PIN	Click on "Play"
Choose appropriate player name	Enter Game PIN
	Choose appropriate player name

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General Spill Response

Spill classification and how to respond



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Spill Response: General

- Types of Releases
  - Hazardous Materials
  - Hazardous Wastes/ Universal Wastes
  - Non-Hazardous Wastes
- Releases may occur as
  - Spill
  - Explosion
  - Fire



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Spill Response: Coordinators

Emergency Response Coordinators (ERC)

ERC = Chief Facility Maintenance Officer (CFMO)

Responsibilities of an ERC:

- Respond quickly
- Familiar with the facility
- Have authority to carry out SPCC (and/or Contingency Plan)
- Activate emergency alarm systems
- Gather information about emergency
- Arrange for cleanup, using available resources
- Provide information to and coordinate with others involved:
  - MDTA Police
  - OESRM
- Communicate with MDTA senior management

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Spill Response

- Spill Classification
  - Major
  - Minor
- Detailed procedures in the SPCC Plan
- Responses must be performed in accordance with
  - SPCC Plan ***and***
  - RCRA Contingency Plan (Integrated Contingency Plan)

All Releases Must Be Cleaned Up Immediately!

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Spill Classification

Minor Spill

- Less than 3 gallons released
- Does **not** reach
  - soil/vegetation
  - sewer system
  - surface water
  - storm water system
- Minimal safety risk
  - No fire or explosion risk

Major Spill (any one of these makes it "major")

- Greater than 3 gallons released
- Release has reached
  - soil/vegetation
  - sewer system
  - surface water
  - storm water system
- Hazard to safety or environment
- Requires resources above facility capabilities

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Minor Spill Response: MDTA Staff

- Person who discovers the spill **must** clean it up!
- Identify source of release and stop it
- Assess the need for PPE
- Assess proximity to waterway, vegetation, etc.
  - Is the spill heading in that direction?
  - If yes, install protective barrier to protect it
- Use appropriate tools/equipment for cleanup
- Perform cleanup activities
- GO BACK! and cleanup the spill response materials

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Minor Spill Response: MDTA Staff

- Is the cleanup material a waste?
  - Can it be reused?
- Waste = proper container for disposal
- Notify a Maintenance Supervisor
- Fill out Discharge Notification Form
  - Give to Facility Environmental Coordinator
  - Uploaded to EEIMS
- Complete spill log in SPCC plan
- OESRM will investigate further, if needed



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Minor Spill Response: How to Perform Cleanup

- Prevent spreading
  - ACT QUICKLY but safely
  - Get assistance from coworkers nearby
- Use sorbent material to collect free liquid
  - Create a barrier around spill first
  - Apply additional absorbent from the outside inward
- Allow absorbent time to absorb
- For fires: appropriately rated fire extinguisher

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How to Perform Cleanup



42

Spill Kit Contents

- PPE: coveralls, gloves, safety glasses and/or face-shields
- Drums, containers, etc. for contaminated material
- Sorbent material: pads, socks, pellets
- Non-sparking shovel, broom, dust pans
- Disposable bags and ties
- Warning signs, cones, etc.



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Major Spill Response

- Evacuate area
- Notify OESRM and CFMO
  - Will notify all agencies on call list in SPCC Plan and/or Contingency Plan
  - Will contact spill response contractor
- Begin cleanup or containment operations only if safe and trained by MDTA to do so
- Complete Discharge Notification Form



44

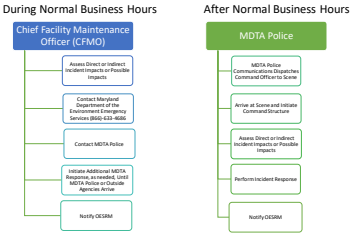
Release Reporting

If necessary, be prepared to report the following information:

- Location of release
- Time of release
- Type of material released
- Estimated quantity released
- Cause of release, if known
- Flow direction
- Potential for release to reach water bodies or soils (or did it already?)
- Description of any injuries
- Description of response measures, if any

45

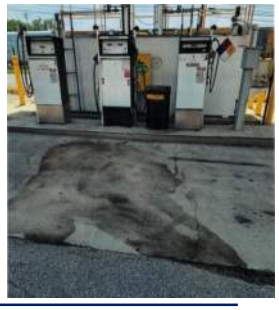
Major Spill Notifications



46

Major Spill at MDTA (BHT)

- A state employee left the vehicle unintended while fueling
- The vehicle overflowed, spilling gallons of diesel in the parking lot



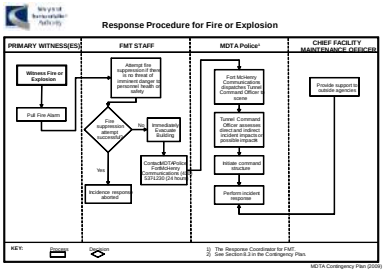
47

Major Spill at MDTA (JFK)





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49

Use of Emergency Equipment

- Fire extinguishers
- Fire alarm system pull station
  - Pull the lever to activate the fire alarm
  - An audible alarm
- Building paging system
- Use of hand-held devices
  - Radios (hand-held and in vehicles)
  - Cell phones



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Waste from Roadway Releases/Spills

- Maintain SEPARATE from facility-generated wastes
- ACDR will create an insurance claim
  - All costs tracked
  - Responsible party billed
- OESRM will collect sample of material
- OESRM will arrange for removal of wastes from facility



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Resources and Information

- SPCC Plan
  - Electronic version – EEIMS
  - Electronic version – Google Earth GIS layer
  - Hard Copy – on site at facility
- MDTA Intranet
  - SOPs
  - Discharge Notification form
  - Contact information for OESRM
    - Email addresses
    - Office phone numbers
    - Cell phone numbers
- Contact OESRM-Environmental

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OESRM Environmental Contacts

Paul Truntich, Director of OESRM/ACDR
410-537-7665 and ptruntich@mdta.state.md.us

Laura Allen, Deputy Director of OESRM/ACDR
410-537-7652 and lallen2@mdta.state.md.us

Hayley Thomas, Environmental Manager
443-683-3013 and hthomas2@mdta.state.md.us

Surakshya Pathak, Environmental Analyst II
410-537-7668 and spathak@mdta.state.md.us

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Questions?



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Section Quiz

1. All MDTA personnel can clean up any spills that arise.
   a. True b. False

If you have access to a telephone, who do you report a spill to FIRST?
_____Maintenance Supervisor, CFMO, OESRM_____

Only _____properly trained_____ personnel are permitted to perform clean up and disposal activities.

Facilities that have an aboveground storage capacity greater than __1,320__ gallons are required to develop an SPCC Plan.

Do materials stored outside require secondary containment?
a. Yes b. No

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Section Quiz

6. A major spill is any spill quantity that reaches soil or water.
   a. True b. False
7. A minor spill is only a spill of less than 1 gallon.
   a. True b. False

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Appendix A.3 - FY 2023 SWPPP Training



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Stormwater Pollution Prevention Training

presented to Maryland Transportation Authority | by AECOM | FY 2023

Housekeeping Items

- Please silence your cell phone.
- Feel free to ask questions at any time – participation is encouraged!

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Today's Training

- Safety moment
- Training agenda
  - Stormwater Pollution Prevention
  - Illicit Discharge Detection and Elimination
  - Stormwater Management at Home



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Safety Moment:
Sun Safety

Sometimes your job may require you to work outside. You may also enjoy recreational activities in the sun. Remember these tips to stay safe:



Tips to keep you safe:

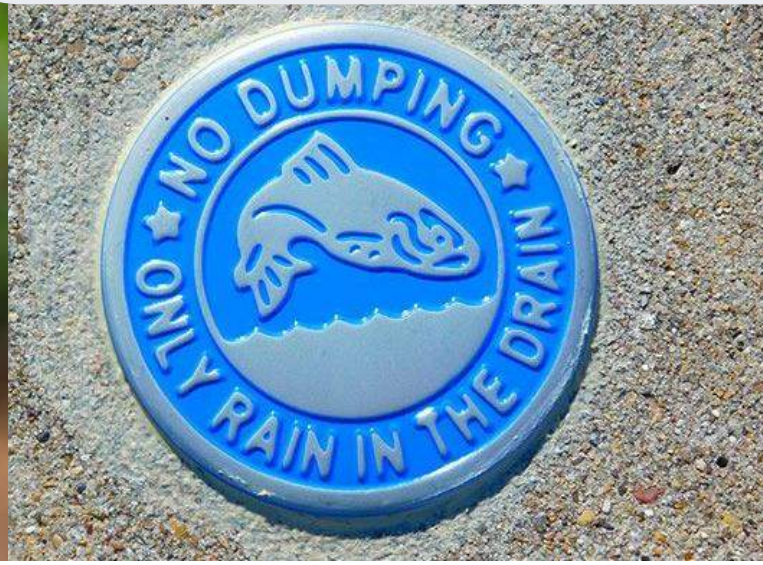
- Wear sunscreen
- Seek shade during the hottest parts of the day
- Wear a hat and protective clothing
- Drink water and take breaks
- Keep an eye out for signs of heat exhaustion in yourself and your friends

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Training Purpose



- Promote environmental awareness
- Safeguard personal and public safety
- Ensure compliance with laws and regulations



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Why is Stormwater Runoff a Problem?

Quantity
Too much runoff can cause flooding

Quality
Runoff can become polluted, affecting local streams and the Bay



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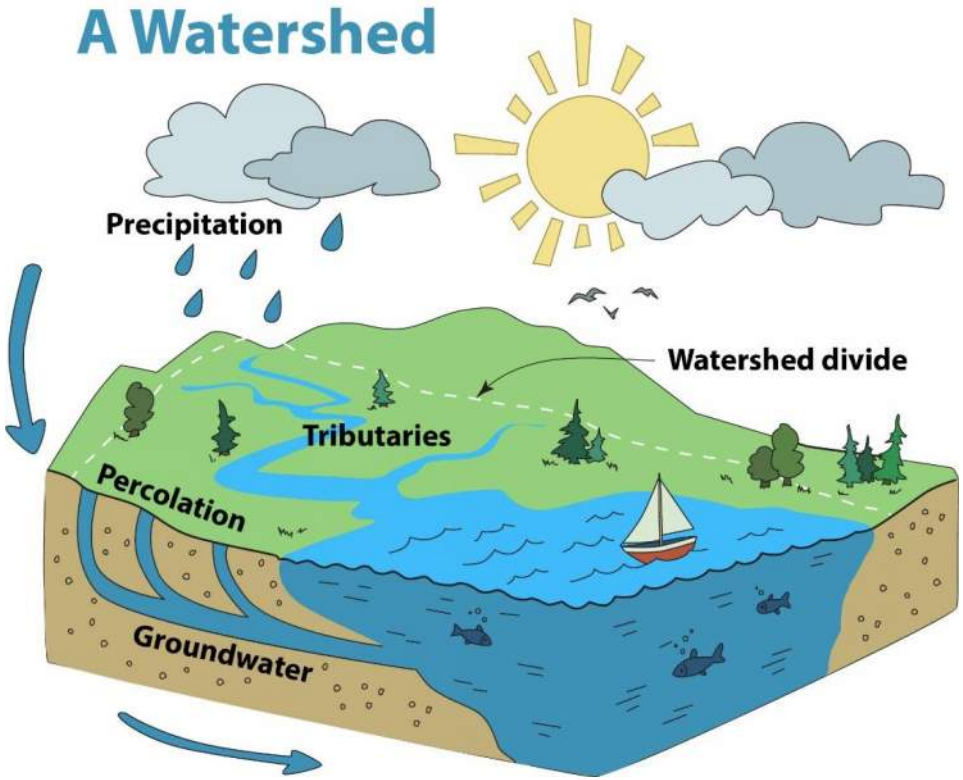
Stormwater Pollution

- When it rains, some of the water soaks into the ground
- Runoff Stormwater flows across hard surfaces
  - Roads
  - Roofs
  - Parking lots
- Runoff from hard surfaces ultimately ends up in local waterways



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Chesapeake Bay Watershed



64,000 square miles

A watershed is an area of LAND that drains to a particular river, lake, bay, or other body of water.

We all live in a watershed. Some watersheds, like that of your local stream or creek, are small. Others, like the Chesapeake Bay watershed, are very large.

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Pollution Effects on Local Water





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Why is Stormwater Pollution Prevention Important?

Environmental Protection

- Runoff quality affects important natural resources
- Swimming, fishing, and boating may be restricted

Health and Safety

- Contaminated runoff can be hazardous to human health

Financial Incentives

- EPA or MDE could audit your site for compliance
- MDTA could receive large fines and penalties



Environment & Energy Report

Pepco to Pay $1.6 Million in Stormwater Discharge Settlement

By Chris Marr

Jan. 13, 2017, 4:47 PM

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Source: City of Willmar, MN

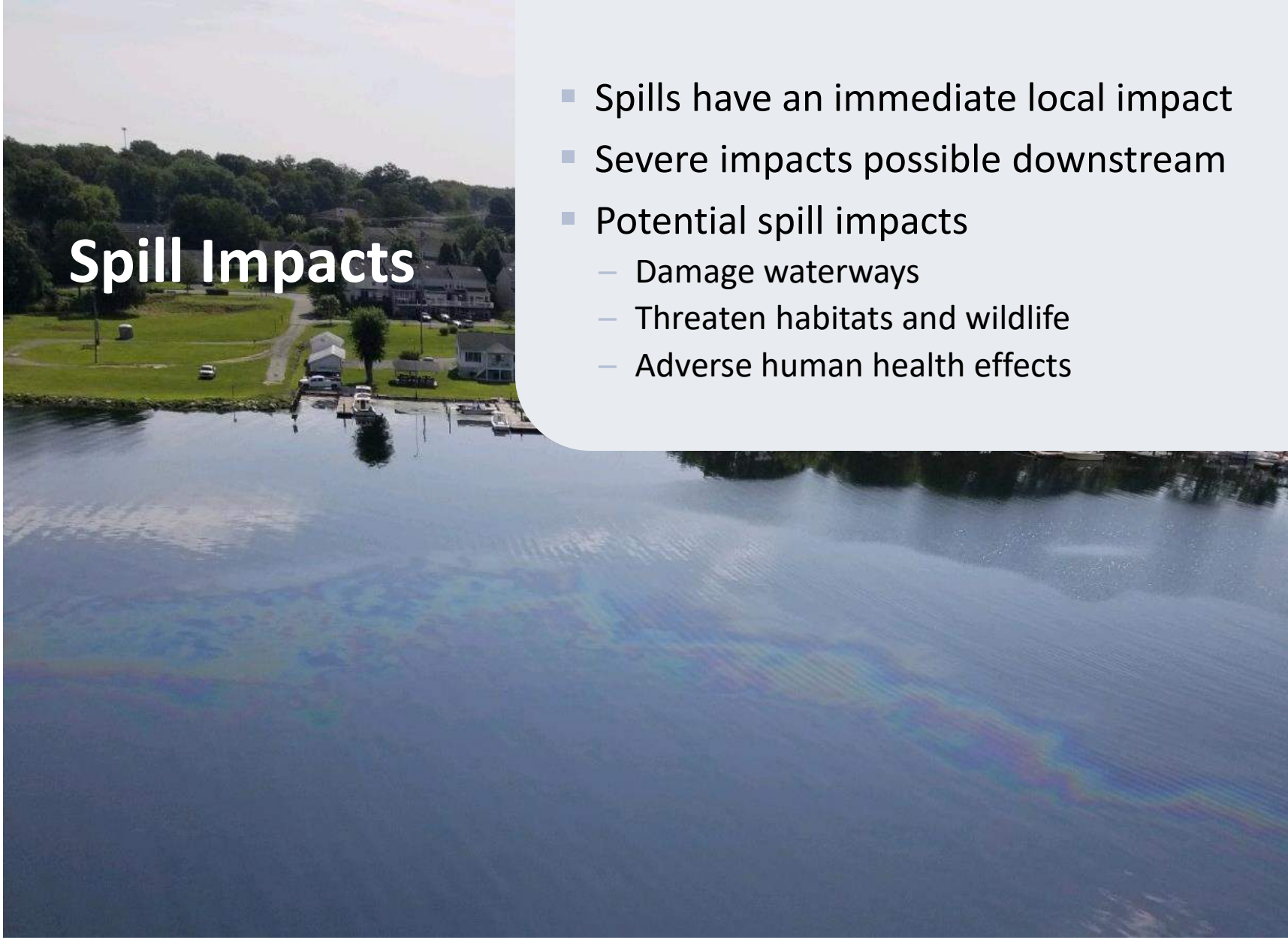
Sewer System Vs. Stormwater System

- Sewer system carries sewage from bathrooms, sinks, kitchens etc.
- Conveys to wastewater treatment plant

- Stormwater system carries rainwater
- It is ***not treated*** before it enters surface water
- What goes into storm drains and eventually flows into the Chesapeake Bay!

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Spill Impacts



- Spills have an immediate local impact
- Severe impacts possible downstream
- Potential spill impacts
  - Damage waterways
  - Threaten habitats and wildlife
  - Adverse human health effects

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Key Responsibilities for MDTA Employees

- Protect Maryland's water resources
- Set a good example for the public
- Know how to identify potential environmental problems
- Report problems so they can be corrected
- Support MDTA's environmental initiatives/goals



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Stormwater Pollution Prevention

Compliance Requirements

EPA => Clean Water Act (CWA)

NPDES: Control Water Pollution

MS4 Permit & Industrial Stormwater Permits

SWPPP & SPCCP

National
Pollutant
Discharge
Elimination
System
(NPDES)

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Stormwater Permits

MS4 Permit

- Regulates stormwater discharges through storm drain systems
- Covers storm drain pipes that discharge runoff from MDTA highways

Industrial Stormwater Permit

- Covers stormwater discharges from industrial activities
- Applies to MDTA maintenance facilities

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MDTA Stormwater Permit: Industrial Activities

Maryland General Discharge Permit 12-SW Permit requires MDTA to:

- Develop a stormwater pollution prevention plan (SWPPP)
- Manage runoff
- Provide annual employee training
- Eliminate non-stormwater discharges
- Minimize exposure
- Perform good housekeeping
- Perform regular maintenance
- Implement spill prevention and response procedures
- Implement erosion and sediment controls

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MDTA Stormwater Permit for MS4s

- MS4: **M**unicipal **S**eparate **S**torm **S**ewer **S**ystems
- Requires certain measures
  - Illicit discharge detection and elimination (IDDE)
  - Pollution prevention and good housekeeping
  - Annual training



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Converting Pervious area to Impervious Area

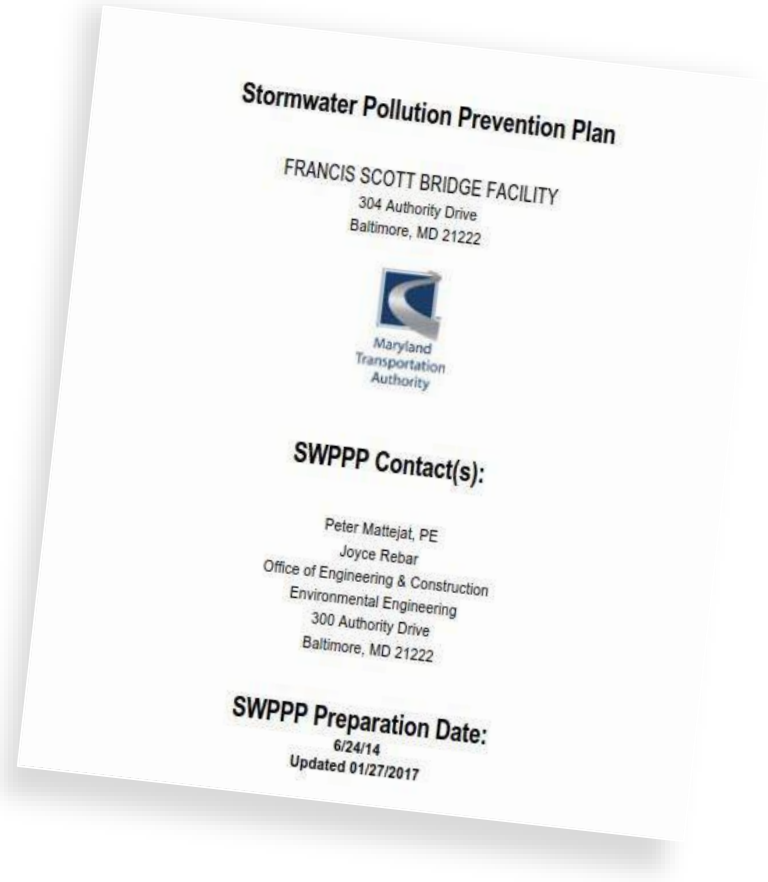
- MDE stormwater and ESC regulations need to be followed for adding new impervious area.
- Impacts MS4 permit under which impervious areas are regulated.
- Coordinate with your CFMO if there is need to add new impervious cover at your site.
- OEC needs to be involved so that new impervious areas are added following MDE regulations.



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SWPPP Components

- SWPPP:
  Storm **W**ater **P**ollution **P**revention **P**lan
- P2 Team:
  Pollution **P**revention Team
- Potential pollutant sources
- Stormwater control measures


Stormwater Pollution Prevention Plan

FRANCIS SCOTT BRIDGE FACILITY
304 Authority Drive
Baltimore, MD 21222

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SWPPP Contact(s):

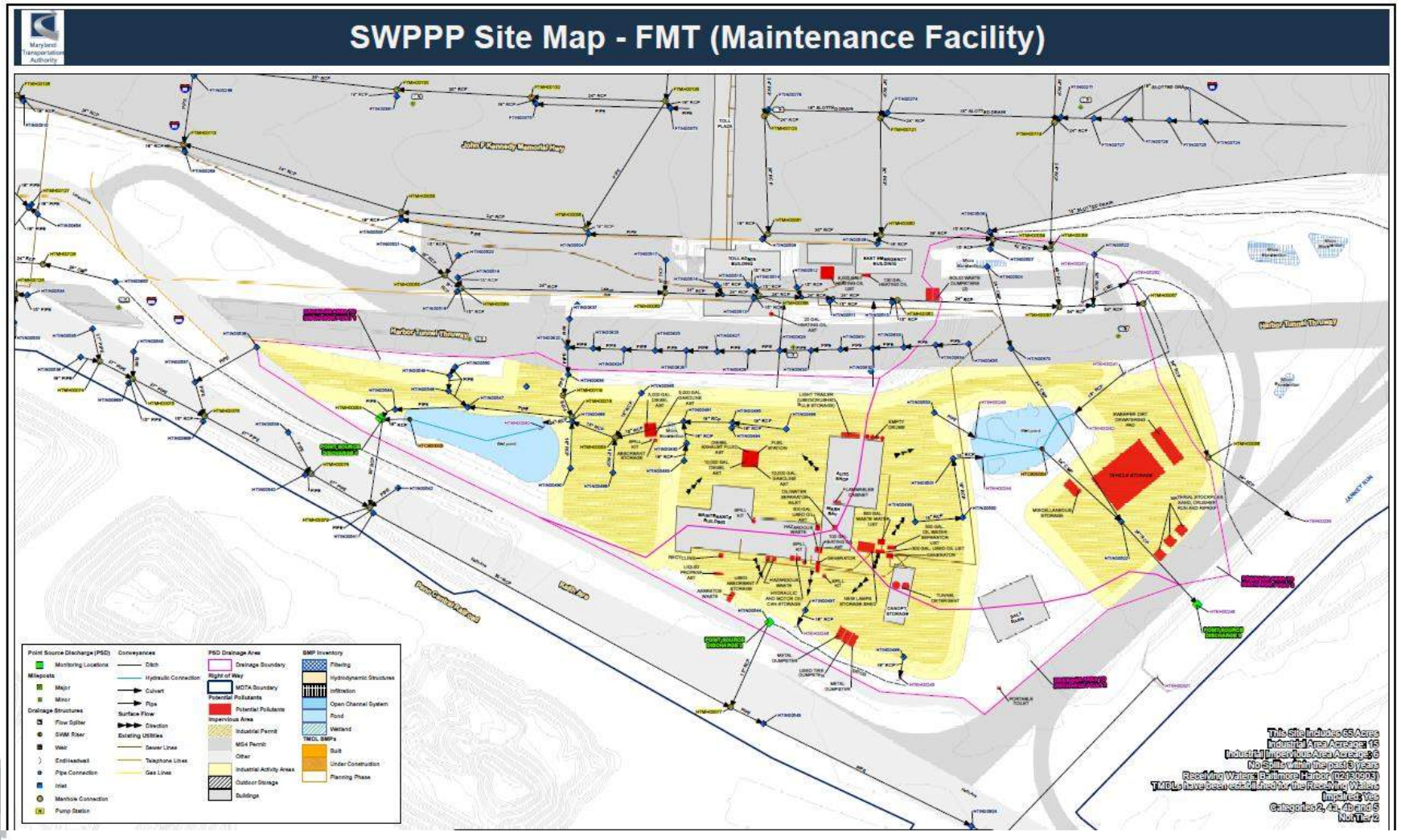
Peter Mattejat, PE
Joyce Rebar
Office of Engineering & Construction
Environmental Engineering
300 Authority Drive
Baltimore, MD 21222

SWPPP Preparation Date:
6/24/14
Updated 01/27/2017

Every MDTA facility has a hardcopy of the SWPPP on site and an electronic copy on EEIMS.

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Your Site



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Common Industrial Pollutants



Bacteria



Heavy Metals



Fertilizers



Pesticides



Petroleum and Oil



Sediment

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Potential Pollutant Sources

Industrial Activity	Associated Pollutants	
Vehicle Maintenance	– Motor oil aboveground storage tank (AST): (3) 275 gallons (gal.) – Used oil filters – Grease	– Dirt – Antifreeze – New/used batteries – Oxidizer
Vehicle Fueling	– Diesel underground storage tank (UST): 6,000 gal. – Diesel exhaust fluid AST: 1000 gal.	– E-85 UST: 2,000 gal. – Gasoline UST: 4,000 gal.
Vehicle Washing	– Salt – Oil	– Grease
Waste Disposal	– Tires – Hazardous waste – Non-hazardous waste – Universal waste – Solid Waste	– Recycling – Asbestos waste – Metal – Batteries – Sweeper waste/dirt
Landscape Maintenance	– Fertilizers	– Pesticides
Material Storage	– Aggregate/gravel/sand	– Minor equipment
Storage Tanks (loading/unloading)	– Diesel generator ASTs: 588 gal.; 1,075 gal.	– Hydraulic oil AST: 275 gal. – Oil/Water separator UST
Salt Storage	– Roadway salt	





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Comprehension Check

Stormwater discharges at your facility are covered under what type of permit?

A. Solid and liquid waste disposal permit

B. Sanitary Sewer permit

C. Non-Potent Discharge Ecosystem Streams Permit

D. National Pollutant Discharge Elimination System permit



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Comprehension Check

Name three potential pollutants that could enter the storm drain system from your facility.

Now, name a potential impact for those pollutants once they enter the storm drain.

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What are BMPs?

- BMP: **B**est **M**anagement **P**ractice
- Control measures used to manage stormwater pollution
- Source control BMPs
  - Prevent release of pollutants at the source
  - Programmatic and activity based
- Stormwater Treatment Practices
  - Engineered practices
  - Collect and treat stormwater runoff



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Pollution Control Measures (BMPs)

- ✓ Minimize Exposure
- ✓ Good Housekeeping
- ✓ Spill Prevention and Response
- ✓ Equipment and Material Storage
- ✓ Vehicle/Equipment Fueling
- ✓ Vehicle/Equipment Washing
- ✓ Vehicle/Equipment Maintenance
- ✓ Erosion and Sediment Control
- ✓ Salt Storage

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Minimize Exposure

- Vehicle maintenance performed indoors
- Covered storage:
  - Salt dome
  - Vehicle and equipment storage
- Canopy over fueling area
- Drip pans and vehicle positioning



Prevent rain from coming into contact with pollutants or potential pollutant sources!

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Good Housekeeping

- Maintain neat, orderly work areas
- Conduct regular inspections
- Promptly clean up spills using dry methods
- Proper storage of waste and maintenance materials
  - Indoors or in closed containers





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Vehicle/Equipment Maintenance and Storage

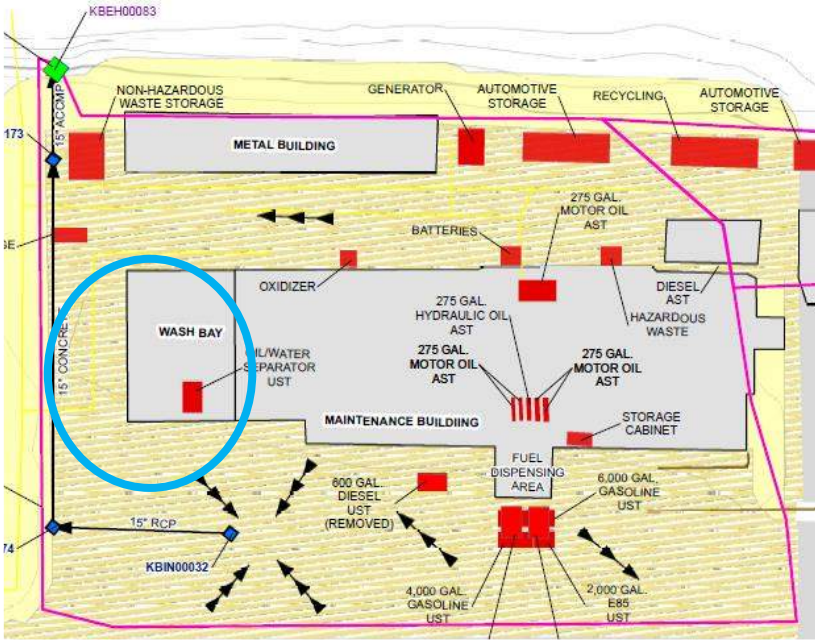
- Perform maintenance indoors
- Use drip pans under leaky vehicles
- Drain and properly dispose of fluids
- Use dry clean-up methods (absorbents)
- Cover vehicles/equipment awaiting maintenance, or store indoors



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Vehicle/Equipment Washing

- Perform all washing at designated wash area
- Position vehicle so water stays within the wash bay
  - Water collected for disposal or goes through oil water separator
- Remove gross debris before washing
- Clean up accumulated debris



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Vehicle/Equipment Fueling

- MDTA S-OPS-ENVF-A-0014-01
  - Dispensing fuel into equipment and portable fuel storage containers
- Do not leave vehicle unattended
- Do not top off tank
- Use spill kit for incidental spills
  - Properly dispose of absorbents
- Report spills immediately



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Erosion and Sediment Control

- Maintain erosion and sediment controls
- Provide cover and/or barriers for sediment storage piles
- Conduct regular site inspections
- Notify your manager if you notice an eroded area



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Salt Storage

- Salt dome provides coverage from exposure
- Use straw bales or other materials to keep excess salt inside
- Excess salt must be covered and cleaned up after use



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Structural BMPs to Manage Runoff

Effective for removing sediment, nitrogen and phosphorus

- Wet ponds
- Dry ponds
- Bioretention
- Bioswales
- Sand filters
- Underground filters



Open Channel



Wet Pond

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Comprehension Check



Name one BMP used at your facility.

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Monitoring and Inspection Requirements

Sector-specific inspections
(weekly and monthly by maintenance facility personnel)

Routine facility inspections
(quarterly by maintenance facility personnel)

Stormwater visual inspections
(quarterly by consultants under guidance of OEC)

Comprehensive site compliance evaluation
(annually by OESRM and OEC)

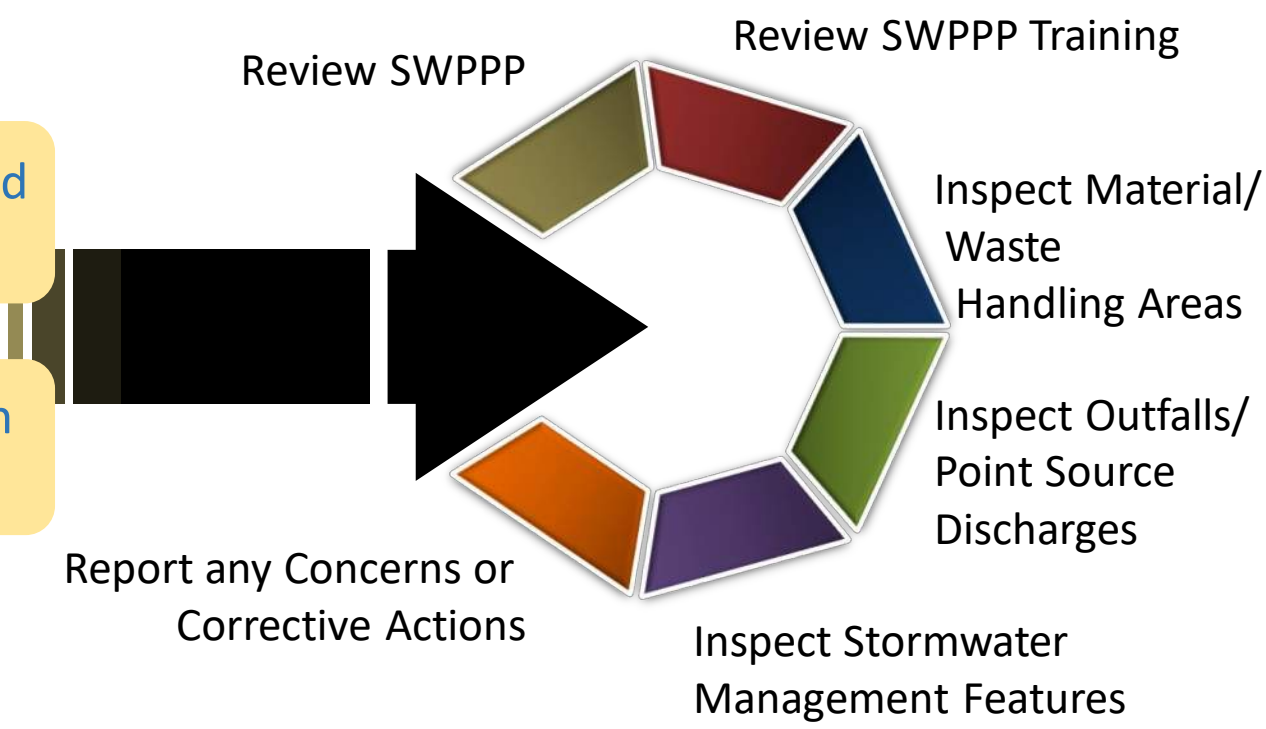
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Compliance Requirements
SWPPP Inspection

Inspection Checklist

Deficiencies noted within 24 hours

Corrective action within 14 days

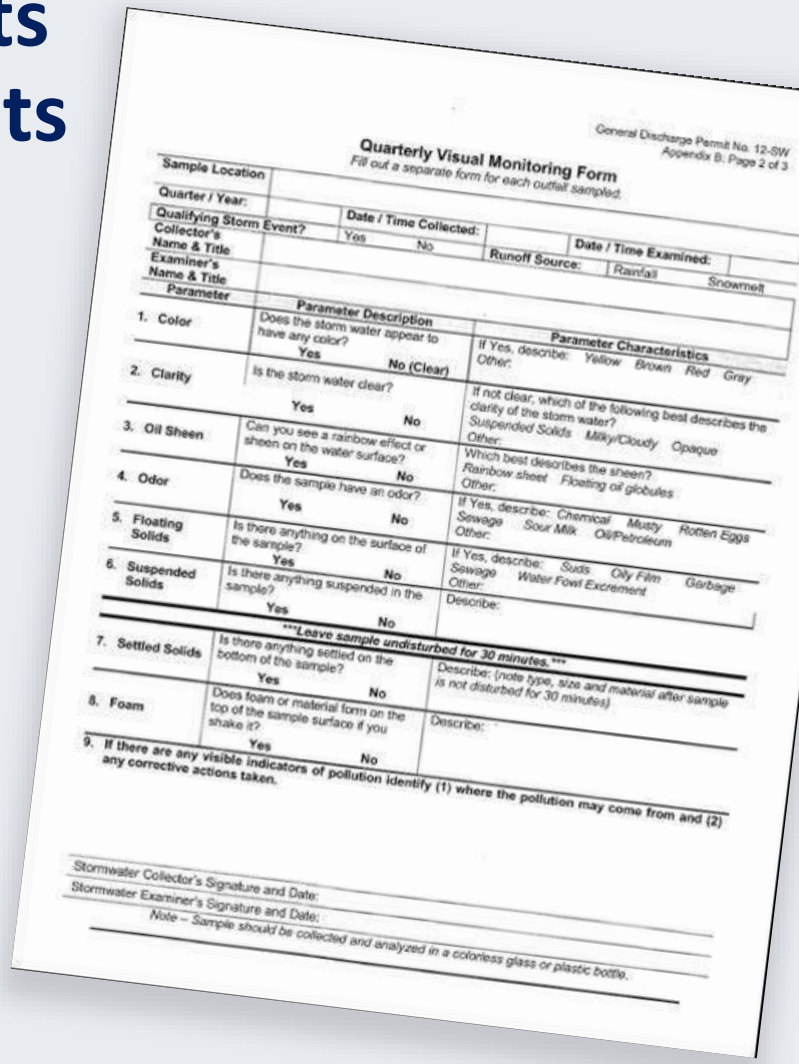


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Compliance Requirements
Visual Outfall Assessments



- Color
- Clarity
- Oil Sheen
- Odor
- Solids
- Foam



General Discharge Permit No. 12-SW
Appendix B: Page 2 of 3

Quarterly Visual Monitoring Form

Fill out a separate form for each outfall sampled.

Sample Location			
Quarter / Year:		Date / Time Collected:	
Qualifying Storm Event?	Yes No	Runoff Source:	Rainfall Snowmelt
Collector's Name & Title		Date / Time Examined:	
Examiner's Name & Title			

Parameter	Parameter Description	Parameter Characteristics
1. Color	Does the storm water appear to have any color? Yes No (Clear)	If Yes, describe: Yellow Brown Red Gray Other:
2. Clarity	Is the storm water clear? Yes No	If not clear, which of the following best describes the clarity of the storm water? Suspended Solids Milky/Cloudy Opaque Other:
3. Oil Sheen	Can you see a rainbow effect or sheen on the water surface? Yes No	Which best describes the sheen? Rainbow sheet Floating oil globules Other:
4. Odor	Does the sample have an odor? Yes No	If Yes, describe: Chemical Musty Rotten Eggs Sewage Sour Milk Oil/Petroleum Other:
5. Floating Solids	Is there anything on the surface of the sample? Yes No	If Yes, describe: Suds Oily Film Garbage Sewage Water Fowl Excrement Other:
6. Suspended Solids	Is there anything suspended in the sample? Yes No	Describe:
	Leave sample undisturbed for 30 minutes.	
7. Settled Solids	Is there anything settled on the bottom of the sample? Yes No	Describe: (note type, size and material after sample is not disturbed for 30 minutes)
8. Foam	Does foam or material form on the top of the sample surface if you shake it? Yes No	Describe:

9. If there are any visible indicators of pollution identify (1) where the pollution may come from and (2) any corrective actions taken.

Stormwater Collector's Signature and Date:

Stormwater Examiner's Signature and Date:

Note – Sample should be collected and analyzed in a colorless glass or plastic bottle.

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SWPPP Exercise

What's wrong with this picture?





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SWPPP Exercise

What's wrong with this picture?





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SWPPP Exercise

What's wrong with this picture?





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SWPPP Exercise

What's wrong with this picture?





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SWPPP Exercise

What's wrong with this picture?





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SWPPP Exercise

What's wrong with this picture?





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SWPPP Exercise

What's wrong with this picture?





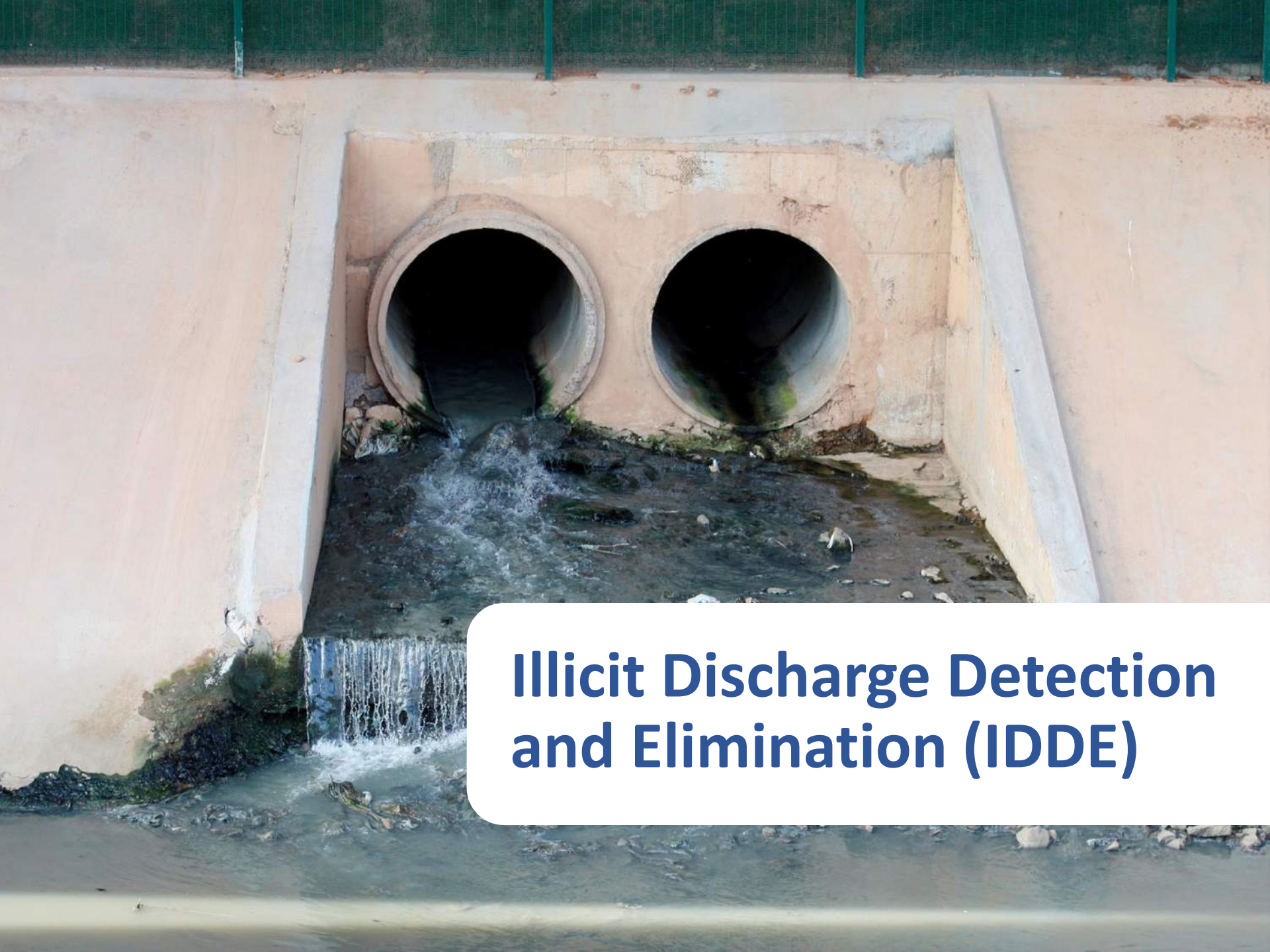
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SWPPP Exercise

What's wrong with this picture?



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Illicit Discharge Detection and Elimination (IDDE)

What is an Illicit Discharge?

- Illicit discharge: dry-weather discharge to or from a storm drain that contains pollutants and/or pathogens
- Storm drains should only flow during and immediately after storms
- Potential IDDE sources
  - Dumping or spills
  - Illicit connections
  - Improper storage
  - Inadequate sediment and erosion controls



Dry weather flows mean something isn't right!

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Allowable Non-Stormwater Discharges



- Air conditioner condensate
- Water from firefighting activities and fire sprinkler maintenance
- Foundation or footing drainage
- Uncontaminated groundwater or spring water
- Landscape and irrigation watering
  - Herbicides, pesticides, and fertilizers must be properly applied

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Common Indicators of Pollution

Cement, paint, caulk, or grout

CLOUDY / MILKY

Oils

RAINBOW SHEEN

Grease

YELLOW/BROWN

Sewage

GRAY



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What to Look For and Report

Illegal dumping



Polluted dry weather flow



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What to Look For and Report

Rainbow sheens





Sheen easily fractures with a stick?

- Non-petroleum
  (likely caused by bacteria)

Sheen quickly reforms after being broken apart?

- Petroleum

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Things to note . . .

- **Odor**
- **Color and clarity**
- **Volume**
- **Floatables: Trash, sewage, suds**
- **Vegetation/wildlife condition: Excessive growth, fish kills**
- **Look for an obvious source**
- **Notice if there are patterns**
- **Take photos that tell the story**

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What To Do Next



Report suspected illicit discharges to MDTA by phone or email:

Jessica Seip
Environmental Engineering
jseipp3@mdta.state.md.us

MDTA will investigate suspected illicit discharges.

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Stormwater Pollution Prevention at Home

Stormwater Pollution Prevention at Home

- Pick up after your pets
- Use car washes that recycle water
- Properly collect and dispose of used oil
  - Perform oil changes at lube shop
- Install a green infrastructure technique:
  - Rain barrel
  - Rain garden
  - Conversation landscaping
  - Tree canopy
  - Permeable pavers
  - Green roof







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Thank you!

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	BHT MAINTENANCE
COURSE TITLE:	SWPPP Training	HOURS	1	INSTRUCTOR(S) (Print)	Melissa Hess

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/22/23	319850	TYLER COURTNEY		9051	OPS.	BHT
	149587	PAUL WATERS		9051	OPS.	BAT
	350754	Tim Lowenson				
	332644	Shalon Gardiner				
	359823	LUCIOUS YOUNG				
	399468	Derrick Cottman				
	397786	Michael Vaughn				
	406109	Ashley Rainey				
	400008	Aheal Somes				
		Michael Bow				
	400282	Daniel E. McDaniel				
	239103	Tamuara Caldwell				
		Brian Mendoza Solano				
		Jerome Burrell				
	351119	Joseph Williams				
		FRED HALL				

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – ~~Printed name~~ *at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/22/23	369350	Ron Jacobs		9051	OPS.	BHT
	278843	ALFRED GREEN				
	375672	William Hart				
		Jamal Carter				
	398084	William Cox				
		Floyd middleton				
		Jaylon Thomas				
	297622	Kevin Byers				
		~~JOHN BOWMAN~~				
	278607	Ryan Bandy				
	85097	Bobby Currie				
	152143	John McDowell				
	361588	Andrew Crown				
		Calvin Collins				
	387651	mason Pixley				
	316576	Mike Finn				

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/22/23		Richard Siegel		9051	OPS.	3HT
	259354	Victoria Leuschner				
	373074	Carmella Boden				
	351652	Dakota Shirk				
	132992	Donald Nagle				

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/22	262064	Lauren White	Lauren White	9071	ops	FMT

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	FMT Conference Room
COURSE TITLE:	Annual SWPPP Training	HOURS	1	INSTRUCTOR(S) (Print)	Melissa Hess

COMMENTS: Night Shift

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6-7-23	160261	Kevin Simons		9071	OPS	FMT
6-7-23	177719	Kenneth Strong		9051	OPS	BHT
6-7-23	392839	Adam West		9071	OPS	FMT
6-7-23	350-341	Abdul Mack		9071	OPS	FMT
6-7-23	238632	Kristine Clark		9071	OPS	FMT
6-7-23	397964	RICARDO SANCHEZ.		9071	OPS	FMT
6/7/23	352819	Eric Schaefer		9071	OPS	FMT
6/7/23	376235	NURUDEEN ADENOLA		9071	OPS	FMT
6/7/23	40[illegible]525	Aidahis Yayo		9071	OPS	FMT
6/7/23	[illegible]	Brian Sharps			OPS	FMT
6/7/23	401753	Simone Meyloe Dixon		9071	OPS	FMT
6-7-23	363464	Theodore Hummert		9051	OPS	BHT
6.7.23	171706	Katrina Morris		9051	OPS	BHT
06/07/23	343183	DeAntre James		9051	OPS	BHT
06/07/23	357043	Rodney Johnson		9051	OPS	BHT
6-7-23	360081	Chad West		9051	OPS	BHT

Supervisor/Instructor Mel Hess (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator (Date)

TRAINING SIGN IN ROSTER

Page ____ of _____

TYPE		COURSE NUMBER:		TRAINING LOCATION	FMT
COURSE TITLE:	Call In Policy	HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
5-30-23		Jacob Meador		9071	OPS	FMT
5.30.23		Dean Byrd		9071	OPS	FMT
5/30/23	350709	Steven Williams		9071	OPS	FMT
5-30-23		Jeff Boswell		9071	OPS	FMT
5/30/23		Phillip Keemer		9071	OPS	FMT
5/30/23		Scott Hasselberger		9071	OPS	FMT
5/30/23		Dominic Day Sr.		9071	OPS	FMT
5.30	330930	Michael Clark		9071	OPS	FMT
5-30	390231	George Smith		9071	OPS	FMT
5-30		Anthony Burns		9071	OPS	FMT
5/30/23	363150	Justin Phillips		9071	OPS	FMT
5.30.23	325332	Brandon Monk		9071	OPS	FMT
5/30/23	145572	Rodney Shirk		9071	OPS	FMT
5/30/23	371940	Josh Meadows		9071	OPS	FMT
5/30/23	141390	Jeff Stanford		~~9071~~	OPS	FMT
5/30/23	125321	John Crouse		9071	OPS	FMT

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

Page ____ of _____

TYPE		COURSE NUMBER:		TRAINING LOCATION	FMT
COURSE TITLE:	Call In Policy	HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
5/30/23	158381	CARL BROCKINGTON	Carl B.	9071	OPS	FMT
5/30/2023	282017	FREDDIE SMITH	Freddie Smith	9071	OPS	FMT
5/30/2023		ALEXANDER NJOKU	alexnjoku	9071	OPS	FMT
5/30/23	398008	Cory Thomas	Cory Thomas	9071	OPS	FMT
5/30/23	191715	Michael Pace		9071	OPS	FMT
5-30-23	379533	HORACE AVENT II	Horace Avent II	9071	OPS	FMT
5-30-2023	377775	Troy Dixon		9071	OPS	FMT
5/30/23		Lendall Evans		9071	OPS	FMT
5/30/23		TariqNKrumah	TNK	9071	OPS	FMT
5/30/23		KEVIN mason	Kevin mason	9071	OPS	FMT
5/30/23	275477	David Reinhardt		9071	OPS	FMT
5/30/23	390871	Jens Dietsch		9071	OPS	FMT
5/30/23	351515	Christin bilmon		9071	OPS	FMT
5/30/23		Shavay lawson	Shavay Lawson	9071	OPS	FMT
5-30-23		Patrick Cyphers		9071	OPS	FMT
5/30/23	405348	Marwin Boyd		9071	OPS	FMT

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

Page ____ of _____

TYPE		COURSE NUMBER:		TRAINING LOCATION	FMT
COURSE TITLE:	Call In Policy	HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
5-30-23		Timothy Younger	Timothy Younger	9071	OPS	FMT
5-30-23		Prakash Kvanal		9071	OPS	FMT
				9071	OPS	FMT
				9071	OPS	FMT
				9071	OPS	FMT
				9071	OPS	FMT
				9071	OPS	FMT
				9071	OPS	FMT
				9071	OPS	FMT
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				9071	OPS	FMT
				9071	OPS	FMT
				9071	OPS	FMT
				9071	OPS	FMT
				9071	OPS	FMT

Supervisor/Instructor _____ **ENTERED INTO LMS BY:** _____

(Sign) – ***Printed name at top of form*** **Coordinator** **(Date)**

6/20/23

FSK

Maryland Transportation Authority

MDTA

Sign in Sheet

Meeting Name/Purpose: _____, Date/Time: _____

CHK	Name	Org	Phone	Email
	Steven Williams			
	MAtthew Fischer			
	Michael Peterson			
	Charles Medera			
	Oscar McCallum	MDTA		
	Antonio Reese	MDTA		
	Nicholas Thornton	MDTA		
	Justin Robinson			
	Kyle Roebuck	MDTA		
	John Sexton	MDTA		
	Kyler Baumann	MDTA		
	Bryant Kun	MDTA		
	Michael Smith	MDTA		
	Joanne Canova	MDTA		
	Gavin McMorris	MDTA		
	Michael Mitchell	MDTA		
	James Combs Jr	MDTA		
	ERIC JOHNSON	MDTA		
	Brent Goetz	MDTA		

Pollution SWPP Training

TRAINING SIGN IN ROSTER

Page 1 of 1

TYPE		COURSE NUMBER:		TRAINING LOCATION	HWNMNT I
COURSE TITLE:	Storm Water	HOURS		INSTRUCTOR(S) (Print)	Claire Weinrib

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6-27-23	140119	Tammy King		9031	Maintenance	HWN
	161961	Troy Walker		9031	Maintenance	HWN
	182287	Darlene Walker		9031	Maintenance	HWN
	286084	John Pilkerton Jr		9031	Auto	HWN
	378673	Collin Rhoads		9031	Maintenance	HWN
	247702	Jim Davies IV		9031	Maintenance	HWN
	266192	Karen Proctor		9031	Auto	HWN
	294331	Jenifer Goldsmith		9031	Maintenance	HWN
	387644	Vincent Butler III		9031	Maintenance	HWN
	391528	Ishmael Camp		9031	Maintenance	HWN
	280280	Howard Webb Jr		9031	Maintenance	HWN
	405300	Sean Ford		9031	Maintenance	HWN

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

Page ____ of _____

TYPE		COURSE NUMBER:		TRAINING LOCATION	EOF ICCE
COURSE TITLE:	SWPPP	HOURS		INSTRUCTOR(S) (Print)	6-13-23

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6-13-23	388177	Breen Sr., Kenneth		9026	OPS	ICC/Maint.
6-13-23	398374	Browne, Denver		9026	OPS	ICC/Maint.
6-13-23		Campbell, GerVase		9026	OPS	ICC/Auto
6-13-23	304580	Carter, Stacey		9026	OPS	ICC/Maint.
6/13/23	407274	Claud, Jalan		9026	OPS	ICC/Maint.
		Collins, Andre		9026	OPS	ICC/Maint.
6 13 23		Crown Jr., Donald		9026	OPS	ICC/Auto
6-13-23	321150	Demetrius, Stephan		9026	OPS	ICC/Maint.
6-13-23	407069	Dodson Jr., Michael		9026	OPS	ICC/Maint.
6-13	358408	Faulk, Amy		9026	OPS	ICC/Maint.
6-13-23	378697	Ford, Clifford		9026	OPS	ICC/Maint.
		Hasselberger, Rick		9026	OPS	ICC/Maint.
6/13/23	321310	Houston, Scott		9026	OPS	ICC/Maint.
6-13-23	326261	Hughes, Joey		9026	OPS	ICC/Maint.
6/13/23	341325	Hunt-El Sr., Deon		9026	OPS	ICC/Maint.
6/13/23	351133	Kirby, Douglas		9026	OPS	ICC/Maint.

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

Page ____ of _____

TYPE		COURSE NUMBER:		TRAINING LOCATION	
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6-13-23	388288	Lewis, Daronte		9026	OPS	ICC/Maint.
6-13-23	375061	Lott Jr., Charles		9026	OPS	ICC/Maint.
		Mahamud, Mohamed		9026	OPS	ICC/Maint.
		Manuel, Tammy		9026	OPS	ICC/Maint.
		Mark, Jaqueline		9026	OPS	ICC/Maint.
		McCoy, Kerry		9026	OPS	ICC/Maint.
6/13/23	369930	Metz Jr., Stephen		9026	OPS	ICC/Maint.
		Meyers, Ronald		9026	OPS	ICC/Maint.
6/13/23	369152	Middleton, Mark		9026	OPS	ICC/Maint.
6/13/23	406055	Moore, Christopher		9026	OPS	ICC/Maint.
6/13/23	405317	Ogunyeye, Samuel		9026	OPS	ICC/Maint.
6/13/23	405270	Olorunfemi, Opeyemi		9026	OPS	ICC/Maint.
6/13/23	397049	Phillips, Brandon		9026	OPS	ICC/Maint.
		Plater, Clarissa		9026	OPS	ICC/Maint.
		Rhock, Hilary		9026	OPS	ICC/Auto

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

Page ____ of _____

TYPE		COURSE NUMBER:		TRAINING LOCATION	
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6-13-23	176231	Rohlfing, Gregory		9026	OPS	ICC/Maint.
6-13-23	397728	Salhan, Nasrulah		9026	OPS	ICC/Maint.
		Thorns, Darlene		9026	OPS	ICC/Maint.
		Tibbs Jr., Vincent		9026	OPS	ICC/Maint.
6/13/23	24844	Toalepai, Eric		9026	OPS	ICC/Maint.
		Torres Rios, Melvin		9026	OPS	ICC/Auto
6/13/2023	313087	Wells, Kevin		9026	OPS	ICC/Maint.
6/13/23	350334	Westervelt III, Ron		9026	OPS	ICC/Maint.
6/13/23	404327	Wilkins, Shaquon		9026	OPS	ICC/Maint.
6/13/23	390392	Yates Jr., Marcus		9026	OPS	ICC/Maint.
6/13/23		Prakash Khanal				MdTA IOEC

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	JFK-1
COURSE TITLE:	SWPPP	HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/29	400879	Rodney Burns	Rodney Burns	9101	OPS	JFK1
6/29	407809	Tyree Bryant	Tyree Bryant	9101	OPS	JFK1
6/29	407991	Dustin Smith	Dustin Smith			
6-29	4398066	Anthony Glover	Anthony Glover	9101	OPS	JFK1
6-29		Raymond Monk	Raymond Monk	9101	OPS	JFK-1
6-29		ROGER BRENGLOVE	Roger Brenglove	9101	OPS	JFK1
6/29	129015	Ricky Gibson	Ricky Gibson	9101	OPS	JFK1
6/29	330565	David Scarlett	David Scarlett	9101	OPS	JFK1
6/29	393782	Shane Courtney	Shane Courtney	9101	OPS	JFK1
6/29		Robert Cather	Robert Cather	9101	OPS	JFK1
6/29	295949	PHIL ISENHART	Phillip Isenhart	9101	OPS	JFK1
6/29	338424	Matt Abel	Matt Abel	9101	OPS	JFK1
6/29	345101	Arthur Pearce	Arthur Pearce	9101	OPS	JFK 1
6-29	149235	Larry Colon	Larry Colon	9101	Utilities	JFK 1
6/29	133999	Edwin Landry	Edwin Landry	9101	OPS	JFK#1
6/29	352321	Nick Scanlon	Nick Scanlon	9101	OPS	JFK-1

Supervisor/Instructor _____ (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator _____ (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/29/23	407939	Dequan Adams		9100	OPS	JFK1
6/29/23	329972	Lisa Camerar		9100	OPS	JFK1
6/29/23	298391	Saber Forsythe		9101	OPS	JFK1
6/29/23		Mike Quinn		9101	OPS	JFK1
6/29/23	405355	Carlos Bobadilla S		9100	ST - OPS	JFK1
6/29/23	277747	James Gullion		9101	OPS	JFK1
6/29/23	403085	Kenneth James		9101	OPS	JFK1
6/29/23	162470	David Bennett		9101	OPS	JFK-1
6/29/23		MARK SARGENT		9101	OPS	JFK-1
6/29/23	404358	SEEK JOSHUA		9101	OPS	JFK-1
6/29/23	407403			9101	OPS	JFK-1
6/29/23		Antoine Mason			OPS	JFK-1
6/29/23	407472	GARY Halstead		9101	OPS	JFK #1
6-29-23	378031	Adrian Thomas		9101	OPS	JFK-1
6-29-23	407847	James King Jr		9101	OPS	JFK-1
6-22-23	399487	Zeke Jauregui		9101	OPS	JFK 1

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/29/23		Jerry Wyatt	Jerry Wyatt		OPS	JFK1
6/29/23		Daniel Willey			OPS	JFK1
6/29/23		Joe Bredehoeft	Joe Bredehoeft		OPS	JFK1
6/29/23	360095	Joshua Lee			OPS	JFK1
6/29/23		Michael Dorbit	Michael Dorbit		OPS	JFK1
6/29/23		Alexander Bahr			OPS	JFK1
6/29/23	365666	Dwayne Bratkowski	Dwayne Bratkowski		OPS	JFK1
6-29-2023		John Moszovsky			OPS	JFK#2
6/29/23	314428	Vince Dunn		9101	OPS	JFK1
6-29-23		Cody Griffith		9101	OPS	JFK1
6-29-23		Daniel Honaker		9101	OPS	JFK-1
6-29-23		Joshua Powers		9101	OPS	JFK-1
6-29-23	298384	Nicholas Bergen		9101	OPS	JFK1
6-29-23	407755	Abraham Zapata		9101	OPS	JFK 1
6-29-23	244497	Jake Bowman		9101	OPS	JFK1
6-29-23		Justin Crowley		9101	OPS	JFK-1

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/29/23		Michael Saddler	Michael Saddler	OPS	JFK1 OOPS	JFK1
6/29/23		Kendall Ricks	Kendall Ricks	OPS		JFK1
6.29.23		Shawn Cummings		OPS	—	JFK1
6.29.23		Zach Deb		OPS	—	JFK1
6.29.23		Prakash Khanal		OEC		MDTA/OEC

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING ROSTER - SOP OR OPERATIONS DIVISIONS TRAINING

TYPE: (SOP,Internal,		COURSE NUMBER:	WO#
TITLE:	SWPP		DATE: 6/1/2023
Instructor (s)	OESRM		LOCATION: JFK Maint 2

Comments: SWPP Training - On Line Course

HRS: 44 Employees

DATE:	EIN#	NAME (Printed)	EMPLOYEE SIGNATURE	RC#	DEPARTMENT
5/1/23	284714	Brown, Don		9102	Maintenance
	265478	Caldwell, Wayne		9102	Maintenance
6-1-23	170277	Cebula, Robert.		9102	Maintenance
6-1-23	241816	Colm, James		9102	Maintenance
6-1-23	298377	Costello, Edward		9102	Maintenance
	316156	Davis, John		9102	Automotive
6-1-23	392563	Dawson, Devin		9102	Automotive
06-01-23	323178	Fender, Kevin		9102	Automotive
	287807	Groh, Matthew		9102	Maintenance
6/1/23	307499	Grove JR, William		9102	Maintenance
	404301	Hrynko, Peter		9102	Maintenance
6/1/23	185134	Jackson, Scott		9102	Utilities
6/1/23	155045	Johnston, Eric		9102	Maintenance
6-1-23	296427	Little, Michael		9102	Maintenance
6/1/23	145800	Mahan Kevin		9102	Maintenance
6/1/23	247498	**Marcum, Charles**		**9021**	Maintenance
6/1/23	357920	Marston, Triston		9102	Maintenance
6-1-23	161367	**May, John**	MAY	**9021**	Maintenance
6-1-23	264785	Mayes, Charles		9102	Maintenance

Submitted By: _____

(signature) Supervisor/Instructor

DATE: 6-1-23

Entered into LMS By: _____ DATE: _____

TRAINING ROSTER - SOP OR OPERATIONS DIVISIONS TRAINING

TYPE: (SOP,Internal,		COURSE NUMBER:	WO#
TITLE:	SWPP		DATE: 6/1/2023
Instructor (s)	OESRM		LOCATION: JFK Maint 2
Comments: SWPP Training - On Line Course			
HRS:	44 Employees		

DATE:	EIN#	NAME (Printed)	EMPLOYEE SIGNATURE	RC#	DEPARTMENT
6-1-23	322812	McCormack, John	John McCormack III	9102	Utilities
	370271	McMullen Tyler		9102	Maintenance
6-1-23	400206	Mills, Jaden	John Mills	9102	Maintenance
	164849	Monk, James (Bryan)		9102	Utilities
6/1/23	165228	Napier, Karen	Karen	9102	Maintenance
6.1.23	317870	Osborne, Lisa	Lisa Osborne	9102	Maintenance
	163385	Philhower,Butch		9102	Maintenance
6-1-23	400176	Pugh, Kate-Lynn	Kate-Lynn Pugh	9102	Maintenance
	254700	Raymond, Lee		9102	Maintenance
6-1-23	309554	**Rea, James**	James Rea	**9021**	Maintenance
	223782	Reagle Edward		9102	Utilities
6/1/23	150934	Saunders, Frank	Frank Saunders	9102	Maintenance
6/1/2023	306072	Seymour, Todd		9102	Automotive
6.1.23	261630	Shaw, Greg		~~9102~~	Maintenance
6-1-23	310796	Shew, George	George Shew	9102	Utilities
6-1-23	363099	Shreve, Shawn	Shawn Shreve	9102	Maintenance
6-1-23	152723	Shue, Raymond		9102	Maintenance
6-1-23	406048	Smith, Paul	Paul Smith	9102	Maintenance
	214735	Snyder, David		9102	Maintenance

Submitted By: _____

Matthews
(signature) Supervisor/Instructor

DATE: 6-1-23

Entered into LMS By: _____ DATE: _____

TRAINING ROSTER - SOP OR OPERATIONS DIVISIONS TRAINING

TYPE: (SOP,Internal,		COURSE NUMBER:	WO#
TITLE:	SWPP		DATE: 6/1/2023
Instructor (s)	OESRM		LOCATION: JFK Maint 2
Comments: SWPP Training - On Line Course			
HRS:	44 Employees		

DATE:	EIN#	NAME (Printed)	EMPLOYEE SIGNATURE	RC#	DEPARTMENT
6/1/23	170543	Strong, William		9102	Maintenance
	303538	Stumpf, Christopher		9102	Maintenance
6-1-23	143318	Taylor, Curtis		9102	Utilities
6 1 23	347570	Trego, James		9102	Automotive
6-1-23	289573	Watts, Roberts		9102	Maintenance
6-1-23	367257	Weiderhold, Amy		9102	Maintenance
6/1/23		Prakash Khanal			MTA, OEC

Submitted By: _____

(signature) Supervisor/Instructor

DATE: 6-1-23

Entered into LMS By: _____ DATE: _____

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	WPL 8/1/23
COURSE TITLE:	SW PPP TRAINING	HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
8/1/23	407502	Trey Nagl		9041	OPS	WPL
8-1-23	283816	Darren Cox		9041	MAINT	WPL
8-1-23	338400	Brian Lowery		9041	OPS	WPL
8-1-23	281928	Alan Plutschak		9041	OPS	WPL
8-1-23	126779	Melvin Prout		9041	OPS/MAINT	WPL
8-1-23	333542	Brad Alyea		9041	OPS	WPL
8/1/23	403431	Isaiah Horsey		9041	OPS	WPL
8/1/23	289900	DON JOHNSON		9041	OPS	WPL
8/1/23		Harold Coleman		9041	OPS	WPL
8/1/23		Kelvin Copper		9041	OPS	WPL
8/1/23	240659	DAVID A. CARVALHO		9041	OPS	WPL
8/1/23	327657	Richard Toft		9041	OPS	WPL
8/1/23		Ben Schmitt		9041	OPS	WPL

Supervisor/Instructor _____ (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator

8/1/2023 (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:			TRAINING LOCATION	WPL Maintenance Building
COURSE TITLE:	Annual SWPPP Training	HOURS	1	INSTRUCTOR(S) (Print)	Claire Weinrib	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
3-15-23	406383	Adam Goad	Adam Goad	9041	OPS	WPL
6-15-23	294775	Antonio Luis	Antonio Luis	9041	OPS	WPL
6/15/23	363143	Kyle Simpson	Kyle Simpson	9041	OPS	WPL
6/15/23	398367	Brendan Ray	Brendan Ray	9041	OPS	WPL
6/15/23	365659	Joseph Williamson	Joseph Williamson	9041	OPS	WPL
6/15/23	396332	Tuaford McHorn	Tuaford McHorn	9041	OPS	WPL
6-15-23	395413	Ronald Bailey	Ronald Bailey	9041	OPS	WPL
6/15/23	401314	Stephen Stone	Stephen Stone	9041	OPS	WPL
6/15/23	407502	Troy Nagl	Troy Nagl	9041	OPS	WPL
6/15/23	392792	ALLAN STRACKE	Allan Stracke	9041	OPS	WPL
6/15/23	337663	Chris Krysiak	Chris Krysiak	9041	OPS	WPL
6/15/23	303132	WILLIAM BROWN	William Brown	9041	OPS	WPL
6/15/23	407076	Brian Zeigler	Brian Zeigler	9041	OPS	WPL
6/15/23	373654	Steven Hyatt	Steven Hyatt	9041	OPS	WPL
6/15/23	290135	EAN Brown	Ean Brown	9041	OPS	WPL / ENV
6/15/23	168151	James Turner	James Turner	9041	OPS	WPL OPS

Supervisor/Instructor _____ (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator _____ (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	WPL Maintenance Building
COURSE TITLE:	Annual SWPPP Training	HOURS	1	INSTRUCTOR(S) (Print)	Claire Weinrib

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/15/23	340991	Phil Collins	Phil Collins	9041	OPS	WPL
6/15/23	256216	RUSSELL CORWIN		9041	OPS	WPL

Supervisor/Instructor _____ (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator _____ (Date)

Appendix A.4 - FY 2024 SWPPP Training



Stormwater Pollution Prevention Training

presented to Maryland Transportation Authority | by AECOM | FY 2024

Housekeeping Items

- Please silence your cell phone.
- Feel free to ask questions at any time – **participation is encouraged!**

Maryland Transportation Authority

Today's Training

- Safety moment
- Training agenda
  - Stormwater Pollution Prevention
  - Illicit Discharge Detection and Elimination
  - Scenarios for Discussion



Safeguard Moment

Distracted Driving

The content of this Safeguard Moment was prepared by AECOM and is intended for awareness purposes. References must be verified by the presenter prior to sharing the Safeguard moment for veracity and to confirm information is up to date. AECOM makes no representations or warranties, express or implied, about the suitability of use by others of the information contained herein.

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Distracted Driving Awareness Month

- April is the National Safety Council's Distracted Driving Awareness Month
- At least **8 people a day** are killed in distraction-related crashes
- How well do you know the **3 main types** of distractions?



Distracted Driving Awareness Month

Follow these steps to avoid distractions:

- Program/start GPS equipment, music or podcasts while the vehicle is safely parked
- Set cell phones to Do Not Disturb and/or silence notifications while driving
- Inform clients, associates and business partners that calls will be returned when employees are not driving
- Pull over safely and park before taking calls, sending texts/emails, or adjusting GPS/music/podcasts



Now all you have to do is drive.

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Training Purpose

- Promote environmental awareness
- Safeguard personal and public safety
- Ensure compliance with laws and regulations

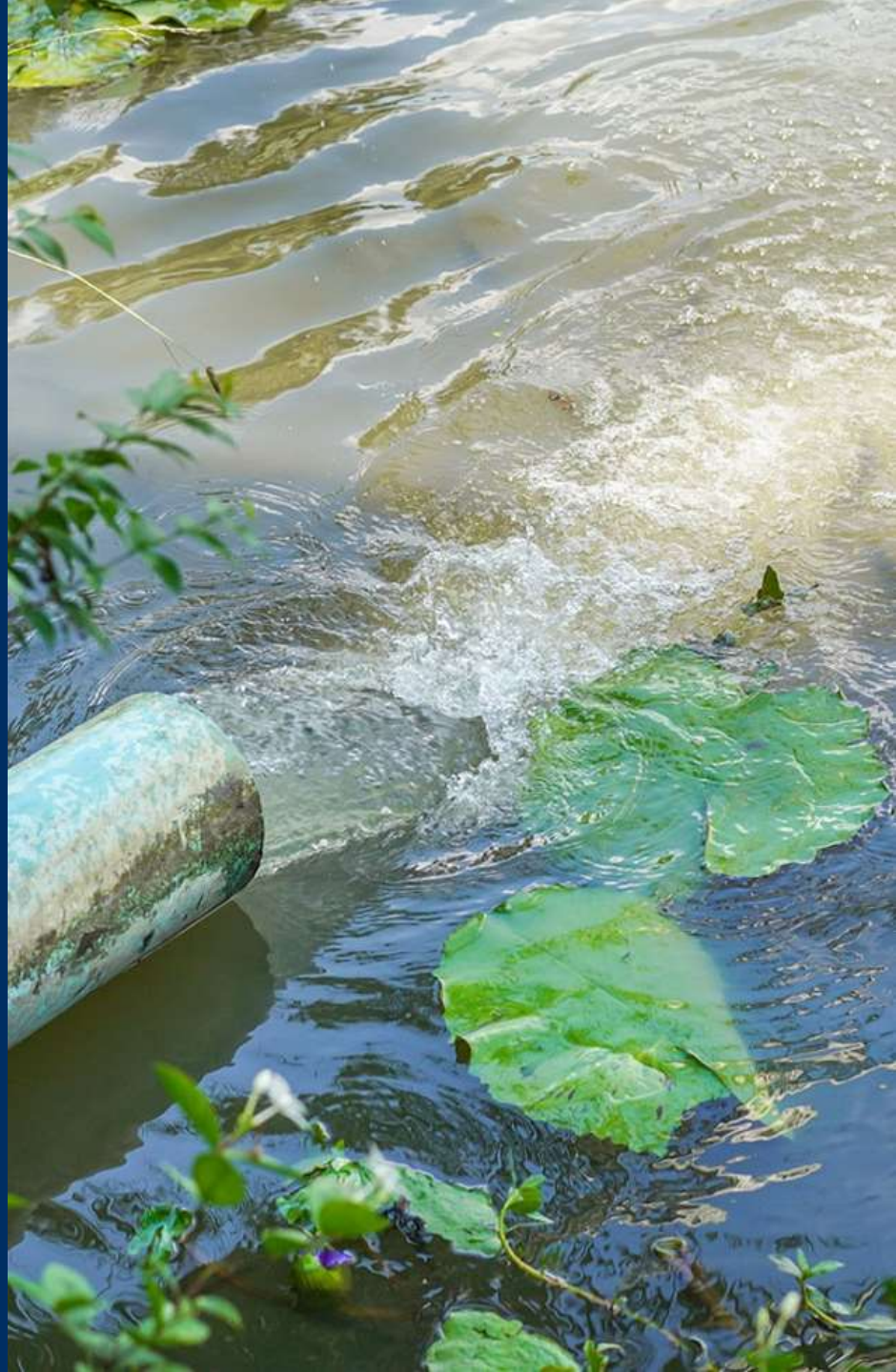


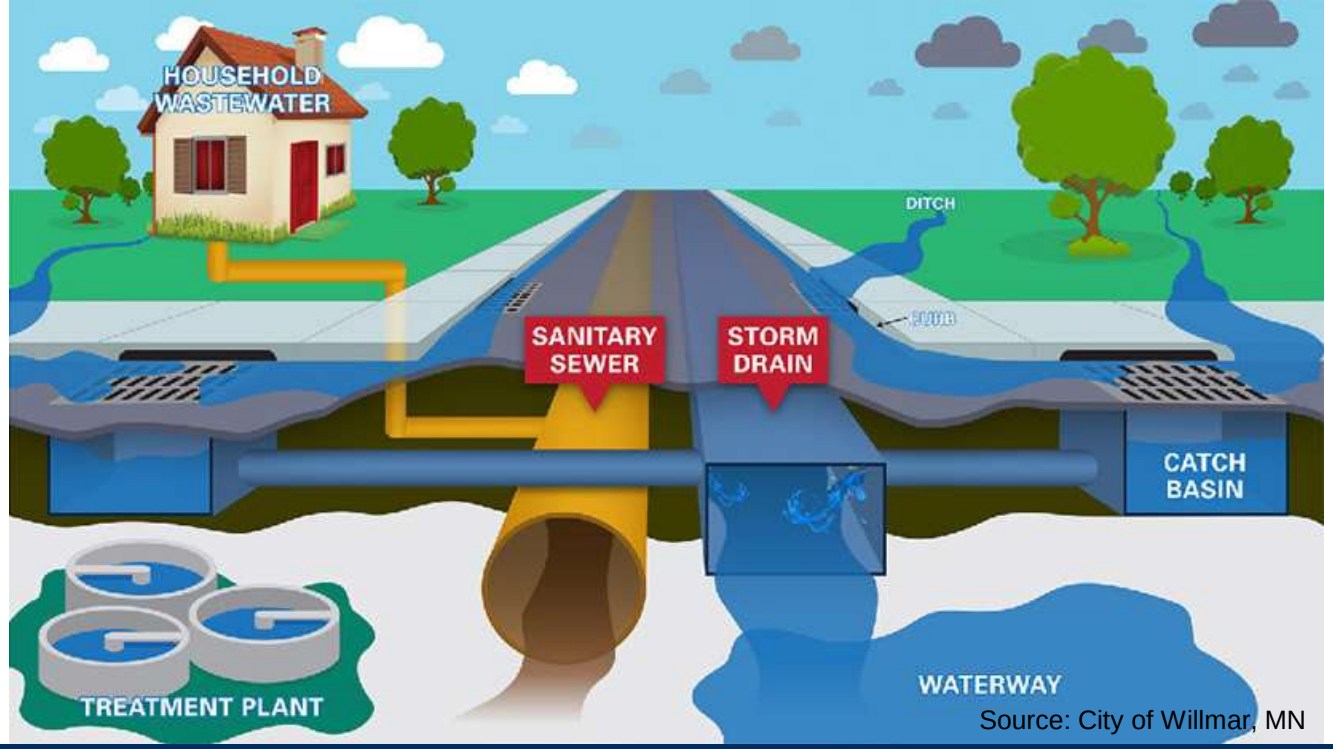


Why is Stormwater Runoff a Problem?

Quantity
Too much runoff
can cause flooding

Quality
Runoff can become
polluted, affecting local
streams and the Bay





Source: City of Willmar, MN

Sewer System Vs. Stormwater System

- Sewer system carries sewage from bathrooms, sinks, kitchens etc.
- Conveys to wastewater treatment plant

- Stormwater system carries rainwater
- It is ***not treated*** before it enters surface water
- What goes into storm drains and eventually flows into the Chesapeake Bay!

Stormwater Pollution

- When it rains, some of the water soaks into the ground
- Runoff flows across hard surfaces
  - Roads
  - Roofs
  - Parking lots
- Runoff from hard surfaces ultimately ends up in local waterways



Pollution Effects on Local Water Resources





Why is Stormwater Pollution Prevention Important?

Environmental Protection

- Runoff quality affects important natural resources

Health and Safety

- Contaminated runoff can be hazardous to human health

Financial Incentives

- MDTA could receive large fines and penalties if sites get audited



Environment & Energy Report

Pepco to Pay $1.6 Million in Stormwater Discharge Settlement

By Chris Marr

Jan. 13, 2017, 4:47 PM

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Key Responsibilities for MDTA Employees

- Protect Maryland's waters
- Set a good example for the public
- Know how to identify potential environmental problems
- Report problems so they can be corrected
- Support MDTA's environmental initiatives/goals





Stormwater Pollution Prevention

NPDES Stormwater Permits

MS4 Permit

- Regulates stormwater discharges through storm drain systems
- Covers storm drain pipes that discharge runoff from MDTA highways

Industrial Stormwater Permit

- Covers stormwater discharges from industrial activities
- Applies to MDTA maintenance facilities

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MDTA Stormwater Permit for MS4s

MS4: Municipal Separate Storm Sewer Systems

Requires certain measures

- Illicit discharge detection and elimination (IDDE)
- Pollution prevention and good housekeeping
- Annual training



MDTA Stormwater Permit: Industrial Activities

Maryland General Discharge Permit 20-SW Permit requires MDTA to:

- Develop a stormwater pollution prevention plan (SWPPP)
- Manage runoff
- Provide annual employee training
- Eliminate non-stormwater discharges
- Minimize exposure
- Perform good housekeeping
- Perform regular maintenance
- Implement spill prevention and response procedures
- Implement erosion and sediment controls

SWPPP Components

- SWPPP:
  Storm **W**ater **P**ollution
  Prevention **P**lan
- Potential pollutant sources
- Stormwater control measures


Stormwater Pollution Prevention Plan

for:

WILLIAM PRESTON LANE Jr. MEMORIAL BRIDGE (BAY BRIDGE) FACILITY
850 Revell Highway
Annapolis, MD 21409
410-537-8117

Maryland Transportation Authority

SWPPP Contacts:

Peter Mattejat, PE
Joyce Retzar
Office of Engineering & Construction
Environmental Engineering
300 Authority Drive
Baltimore, MD 21222
410-537-7874 / 410-537-7857
pmattejat@mdta.state.md.us / jretzar@mdta.state.md.us

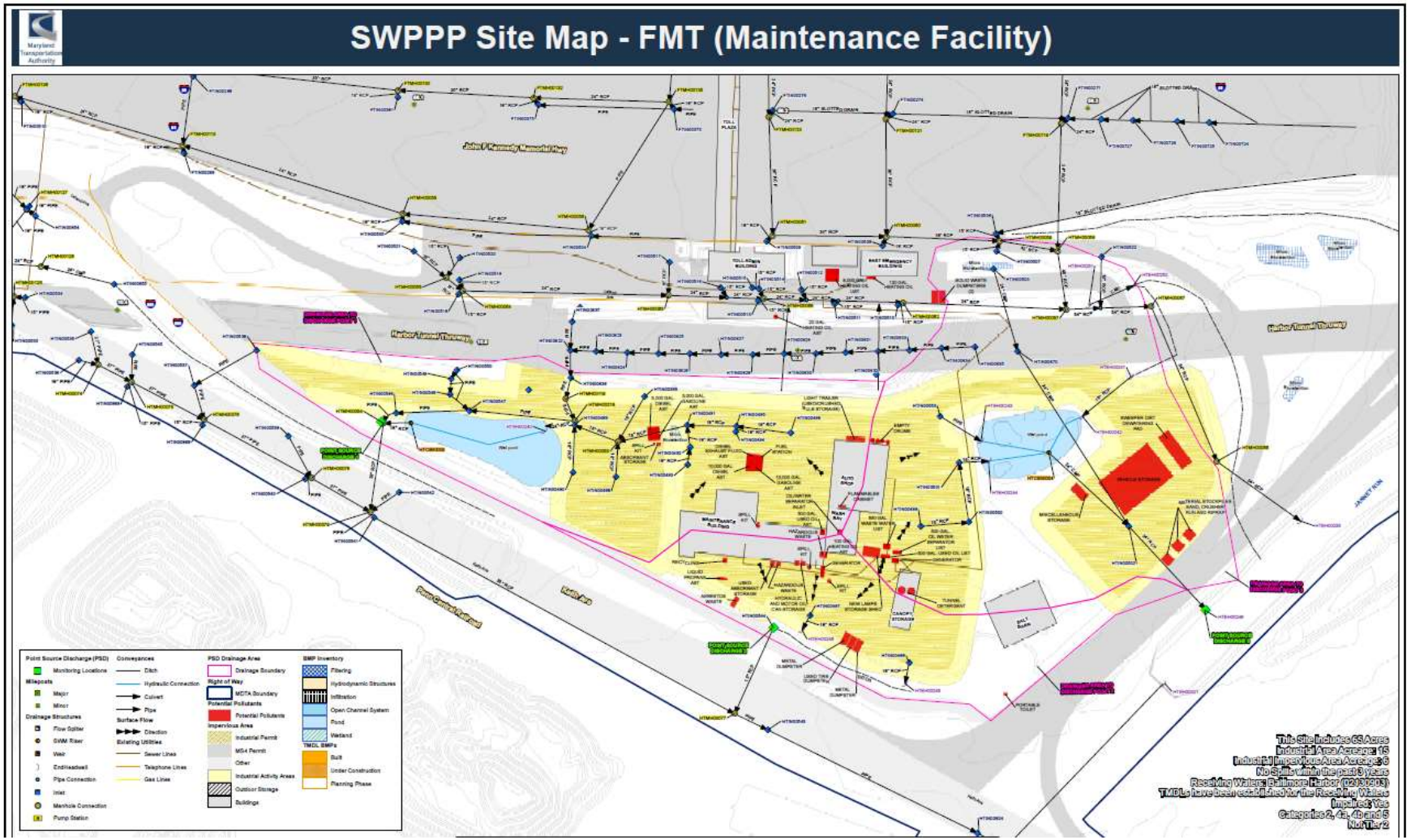
SWPPP Preparation Date:

06/21/2019

Every MDTA facility has a hardcopy of the SWPPP on site and an electronic copy on EEIMS.

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Your Site


SWPPP Site Map - FMT (Maintenance Facility)
John F Kennedy Memorial Hwy
Harbor Tunnel Thruway
Point Covington Drive
Point Covington Drive
This Site Includes 65 Acres
Industrial Area Acreage: 15
Industrial Impervious Area Acreage: 6
No Spills within the past 3 years
Receiving Waters: Baltimore Harbor (02130903)
TMDLs have been established for the Receiving Waters
Impaired: Yes
Categories 2, 4a, 4b and 5
Not Tier 2

Common Industrial Pollutants



Bacteria



Heavy Metals



Fertilizers



Pesticides



Petroleum and Oil



Sediment

Potential Pollutant Sources

- Vehicle Maintenance
- Vehicle Fueling
- Vehicle Washing
- Waste Disposal
- Landscape Maintenance
- Material Storage
- Storage Tanks
- Salt Storage





What are BMPs?

- BMP: **B**est **M**anagement **P**ractice
- Source control BMPs
- Stormwater Treatment Facility





Pollution Control Measures (BMPs)

- ✓ Minimize Exposure
- ✓ Good Housekeeping
- ✓ Spill Prevention and Response
- ✓ Equipment and Material Storage
- ✓ Vehicle/Equipment Fueling
- ✓ Vehicle/Equipment Washing
- ✓ Vehicle/Equipment Maintenance
- ✓ Erosion and Sediment Control
- ✓ Salt Storage



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Minimize Exposure

- Vehicle maintenance performed indoors
- Covered storage
- Canopy over fueling area



Prevent rain from coming into contact with pollutants or potential pollutant sources!

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Good Housekeeping

- Maintain neat, orderly work areas
- Conduct regular inspections
- Promptly clean up spills using dry methods
- Proper storage of waste and maintenance materials







Spill Prevention

- Potential off-site spill impacts
  - Damage waterways
  - Threaten habitats and wildlife
  - Adverse human health effects

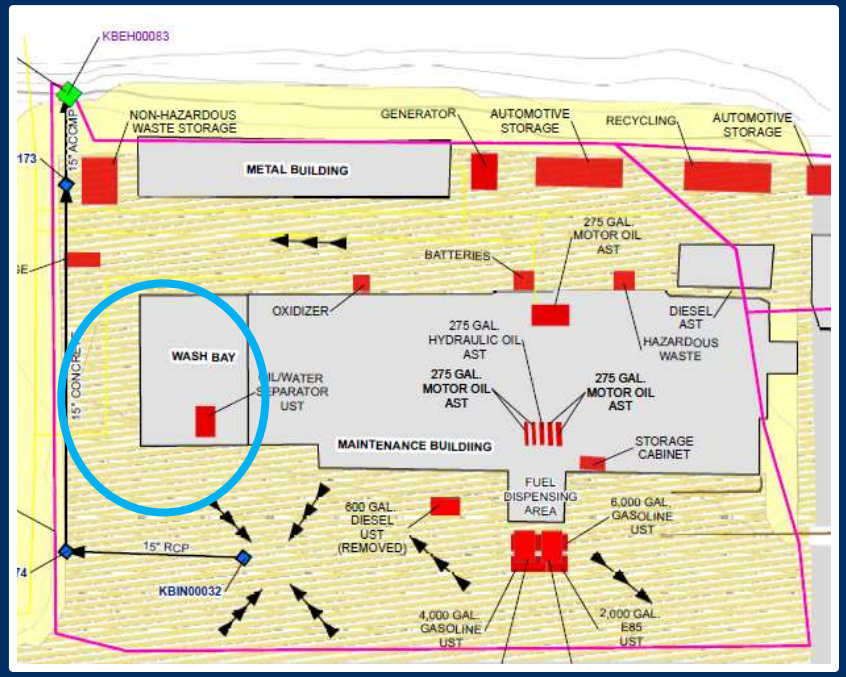
Vehicle/Equipment Maintenance and Storage

- Perform maintenance indoors
- Use drip pans under leaky vehicles
- Use dry clean-up methods (absorbents)
- Cover or store indoors



Vehicle/Equipment Washing

- Perform all washing at designated wash area
- Position vehicle so water stays within the wash bay
- Clean up accumulated debris



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Vehicle/Equipment Fueling

- Do not leave vehicle unattended
- Do not top off tank
- Use spill kit for incidental spills
- Properly dispose of absorbents
- Report spills immediately



Erosion and Sediment Control

- Maintain erosion and sediment controls
- Proper outside storage of materials
- Conduct regular site inspections
- Notify your manager if you notice an eroded area



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Salt Storage

- Salt dome provides coverage from exposure
- Use straw bales or other materials to keep excess salt inside



Structural BMPs to Manage Runoff



Open Channel

Effective for removing sediment, nitrogen and phosphorus

- Wet ponds
- Dry ponds
- Bioretention
- Bioswales
- Sand filters
- Underground filters



Wet Pond

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Name one BMP used at your facility.



Kahoot #1

Monitoring and Inspection Requirements

Routine facility inspections

Stormwater visual inspections (quarterly by consultants)

Comprehensive site compliance evaluation (annually)

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SWPPP Exercise

What's wrong with this picture?





SWPPP Exercise

What's wrong with this picture?



SWPPP Exercise

What's wrong with this picture?



SWPPP Exercise

What's wrong with this picture?



SWPPP Exercise

What's wrong with this picture?



SWPPP Exercise

What's wrong with this picture?



SWPPP Exercise

What's wrong with this picture?



SWPPP Exercise

What's wrong with this picture?





Kahoot #2



Illicit Discharge Detection and Elimination (IDDE)

What is an Illicit Discharge?

- Dry-weather discharge to or from a storm drain that contains pollutants
- Storm drains should only flow during and immediately after storms



Dry weather flows mean something isn't right!

Common Indicators of Pollution

Cement, paint, caulk, or grout

CLOUDY / MILKY

Oils

RAINBOW SHEEN

Grease

YELLOW/BROWN

Sewage

GRAY



What to Look For and Report

Illegal dumping



Polluted dry weather flow



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What to Look For and Report

Rainbow sheens





Sheen easily fractures with a stick?

- Non-petroleum
  (likely caused by bacteria)

Sheen quickly reforms after being broken apart?

- Petroleum

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Things to note . . .

- **Odor**
- **Color and clarity**
- **Volume**
- **Floatables: Trash, sewage, suds**
- **Vegetation/wildlife condition: Excessive growth, fish kills**
- **Look for an obvious source**
- **Notice if there are patterns**
- **Take photos that tell the story**

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What To Do Next



Report suspected illicit discharges to MDTA by phone or email:

Jessica Seipp
Environmental Engineering
jseipp3@mdta.state.md.us

MDTA will investigate suspected illicit discharges.

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Kahoot #3



Scenarios for Discussion

Scenarios on-site that need additional consideration before action

1. New equipment needs to be installed
2. A need for additional parking on site
3. Cutting down trees

- What are some other scenarios at the facilities that could need approval and require environmental considerations prior to installation?

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What are some additional ways to implement SWPP at home or in your everyday life?

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Kahoot #4



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Thank you!

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:	SUPPP Training	TRAINING LOCATION	BHT
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
5/28/24	373074	Carmella Boden	Carmella Boden	9051	OPS	BHT Maint.
5/28/24	369350	Ronald D Sacato Jr		9051	OPS	BHT maint
5-28-24	316 596	Mike Fink		9051	OPS	BHT maint.
5-28-24	375672	William Harsh		9051	OPS	BHT Maint
5/28/24	400282	Daniel McDaniel	Daniel McDaniel	9051	OPS	BHT
5-28-24	420424	Shawn Mayes		9051		BHT
5-28-24	405911	Seth Carroll		9051	OPS	BHT
5-28-24	404943	DeShawn Thomas	DeShawn Thomas	9051	OPS	BHT
5-28-24		Calvin Collins	Calvin Collins	9051	OPS	BHT Auto
5-28-24	412179	Kevin Louden	Karyn Louden	9051	OPS	BHT
5-28-24	185097	Bobby Currie	Bobby Currie	9051	OPS	BHT Maint
5-28-24	398089	William Cox		9051	OPS	BHT
7-28-24		RODNEY MASON		9051	OPS	BHT
7-28-24		Richard Siegel		9051	OPS	BHT
5-28-24	312554	Joon Kim		9051	OPS	BHT
5.28.24	139823	Lucious Young	Lucious Young	9051	OPS	BHT/Auto

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:	SWPPP Training	TRAINING LOCATION	BHT
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
5/28/24	294492	Thomas JJ Jenkins		9051	OPS	~~BHT~~ BHT
5/28/24	399962	Derrick Cottman		9051	OPS	BHT
5/28/24		Jayla Brown				BHT
5/28/24	406376	Brian Medrano Solano		4051	OPS	BHT
5-28-24		CRAIG CLINTON			OPS	BHT
5-28-24		Jerome Burrell		9051	OPS	BHT
5/28	387651	mason bibb				BHT
05/28/24	152143	John McDowell		9051	OPS	BHT/AUTO
5/28/24	239103	Tammara Caldwell		9051	OPS	BHT
5-28-24	351119	Joseph Williams		9050	OPS	BHT/ signshop
5-28-24	354103	Floyd middleton			OPS	BHT
5-28-24	390743	Patrick Cyphers		9051	OPS	BHT
5-28-2024	350754	Timothy Lawrence		4057	OPS	BHT
5-28-2024	405991	JONATHAN TARBURTON		9057	OPS	BHT
5-28-24	259364	Victoria Leuschner		9051	OPS	BHT/AUTO
5-28-24		Nachor Fulwood		9051	OPS	BHT/Auto

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:	Supp PP Training	TRAINING LOCATION	BHT
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
5-28	351652	Dakota Shirk		9051	Maintenance	BHT
5/28	304850	Trent Courtney		9051	OPS / MAINT.	BHT
5/28	177719	Kenneth Stacy Jr		9051	Maint	BHT
5/28	361538	Andrew Crown		9051	OPS	BHT
5/28	132991	Donald Nobles		9051	OPS	BHT
5/28		FRED HALL		9051	OPS	BHT

Supervisor/Instructor _____ (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ **Coordinator** (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:	SWPPP	TRAINING LOCATION	FMT
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	Kristen Salkowski

COMMENTS:

6/20 158381 CARL BROCKINGTON Carl B. OPS FMT

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/20	160261	Shawn Simons			OPS	FMT
6-20	337649	Dominic Day Sr	Dominic Day Sr			FMT
6/20		Raymond Barber	Raymond Barber		OPS	FMT
6/20	376235	Nurudeen Adeniola	Nurudeen Adeniola		OPS	FMT
6/20	275437	Trevor Webb			OPS	FMT
6/20	406260	Kendall Evans	Kendall Evans		OPS	FMT
6/20	398008	Cory Thomas	Cory Thomas			FMT
6/20	405652	Alexander Njoku			OPS	FMT
6/20	413824	Trent Rhinehart	Trent Rhinehart			FMT
6/20		Sarah Smith	Sarah Smith			FMT
6/20	411707	Stephen Ashley	Stephen Ashley			FMT
6/20	407941	Sylvester Fields	Sylvester Fields		OPS	FMT
6/20/2024	409018	Garland Davis	Garland Davis			FMT
6/20/2024	424436	Kevin Holt	Kevin Holt			FMT
6/20	351515	Christine Gilmore				FMT
6/20	132398	Sherri Michael	Sherri Michael		OPS	FMT

Supervisor/Instructor Kristen Salkowski (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:	SWPPP	TRAINING LOCATION	FMT
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	Kristen Salkowski

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/20/24	141390	Jeff Stadtfeld			OP	9071
6/20/24		Anthony Billings				
6/20/24	282017	FREDDIE SMITH				
6/20/24	124201	Jon Chancellor			OP	9071
6/20/24	412858	Deonte White			OP	9071
6/20/24		Andrew Coroneos		9070	OPC	FMT
6/20	256971	Dean Byrd		9071		FMT
6/20	419024	Mike Campbell				FMT
6/20	390231	George Smith				
6/20		Bashaw, Delanta				FMT
6-20-2024		Gary Hoppe		9071		FMT
6/2024	143707	Mark Smith		9071		FMT
6/2024		LUKE KALB			OPS	FMT
6/20/24	355332	Brandon Monk		9071	OPS	FMT
6/20/24	153423	Mike Smith				FMT Auto
6/20/24	191715	Michael Pace				FMT Auto

Supervisor/Instructor Kristen Salkowski. **ENTERED INTO LMS BY:** _____

(Sign) – *Printed name at top of form* **Coordinator** **(Date)**

DATE	EIN#	NAME (PRINTED)	EMPLOYEE SIGNATURE	RC#	DIVISION	FACILITY
6/20	337694	Phillip Keemer	Phillip Keemer		OPS	FMT
6/20	309059	THOMAS HUNT	thomas Hunt	9017	OPS	FMT
6/20	365642	Kenia Lopez	Kenia Lopez			FMT
6/20	398992	KEVIN MASON	Kevin Mason			FMT
6/20	416085	Brandon Tornin	Brandon Tornin			FMT
6/20	396837	Shavay Lawson	Shavay Lawson			FMT
6/20		LaTonya Player	LaTonya Player			FMT

TYPE		COURSE NUMBER:	SWPPP	TRAINING LOCATION	FSK 304 Lunchroom
COURSE TITLE:	Pollution Prevention Training	HOURS	1	INSTRUCTOR(S) (Print)	

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc.)	FACILITY/DEPT
		Allen-				
	398626	Baumann-				
		Berlau		9061	OPS	FSK
	399494	Brogan		9061	OPS	FSK
6-6-24	415910	Casselman			OPS	FSK
6-6-24	378666	Combs -8		9061	OPS	FSK
6/6/24	227599	Dickens		9061	OPS	FSK Maint
	333948	Dyce		9061	OPS	FSK Maint
6/6/24	293273	Fischer		9061	OPS	FSK Maint
	175760	Franklin		9061	OPS	FSK MAINT
6/6/24	413497	Hanlin		9061	OPS	FSK Maint
6-6-24	398633	Hasan		9061	OPS	FSK maints
6-6-24	241489	Johnson, S		9061	OPS	FSK MAINT
	306959	Keys -				
	388122	King		9061	OPS	FSK

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TYPE		COURSE NUMBER:		TRAINING LOCATION	
COURSE TITLE:		HOURS		INSTRUCTOR(S) (Print)	

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc.)	FACILITY/DEPT
6-6-24	330589	Madera		9061	OPS	FSK
6/6/24	292757	Major	B. Major	9061	OPS	FSK
6/6/24	323482	Maynard		9061	OPS	FSK
6/6/24	246873	McCallum	Oscar McCallum II	9061	OPS	FSK
	405324	McMorris		9061	OPS	FSK
	~~414661~~	~~Morrison~~				
		Parra		9061	FSK	FSK
	220620	Peterson	Michael Peterson	9061	OPS	FSK Maint
06/06/24	406000	Reese		9061	OPS	FSK
06/6/24	406017	Robinson	Justin Robinson	9061	OPS	FSK
06/6/24	402774	Roebuck		9061	OPS	FSK
6-6-24	346931	Rose		9061	OPS	FSK
6-6-24	415422	Savage		9061	OPS	FSK
	280716	Smith	M. Smith		OPS	FSK Maint
	169493	Still				
6/6/24	170543	Strong			OPS	FSK Maint
6/6/24	416306	Thompson	Deyonde Thompson	9061	OPS	FSK Maint
	416641	Ushry		9061	OPS	FSK Maint
6-6-24	414654	Williams B.		9061	OPS	FSK Maint
	350709	Williams S.			OPS	FSK maint

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	ICC TRAINING ROOM
COURSE TITLE:	SWPP	HOURS		INSTRUCTOR(S) (Print)	Kristen Salkowski

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6-11-24	176251	Gregory Rohlfs		9026	OPS	ICC/maint
6-11-24	390334	Ronald westervelt		9026	OPS	ICC/STS
6-11-24	304580	Stacey L Carter		9026	OPS	
6-11-24	341325	Deon Hunt-El		9026	OPS	
6-11-24	369152	[illegible]		9026	OPS	
6-11-24	416313	Marisa Phipps		9026	OPS	
6-11-24	369930	Stephen metz		9026	OPS	ICC/OPS
6.11.24	397728	Nesreiah Salhain		9026	OPS	
6-11-24	375061	Charles Lott		9026	OPS	FCC
6/11/24	321310	Scott Houston		9026	OPS	ICC
6/11/24		Kevin Wells		9026	OPS	ICC
6-11-24	378697	Clifford Ford		9026	OPS	ICC
6-11-24	405270	Oyeyemi Olowopeni		9026	OPS	ICC
6-11-24		Shaquon Wilkins		9026	OPS	ICC

Supervisor/Instructor Kristen Salkowski (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	ICC TRAINING ROOM
COURSE TITLE:	SWPP	HOURS		INSTRUCTOR(S) (Print)	Kristen Salkowski

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6-11-24	400886	Mohamed Muhamud		9026	OPS	ICC
6-11-24		Andrew Possie		9026	OPS	
6-11-24	415723	Matthew Icroll		9026	OPS	dcc
6-11-24		Brandon Phillips		926	OPS	ICC
6-11-24	276672	Hilary Rhoad		9026	OPS	ICC/Auto
6-11-24		Gervase Campbell			OPS	ICC/Auto
6-11-24		Delmore Shelton	Delmore Shelton		OPS	ICC-Auto
6-11-24	421416	William Golden			OPS	ICC
6-11-24	311439	Vincent Tibbs			OPS	ICC
6-11-24	414296	Donté Marks			OPS	ICC
6-11-24	412-454	Charles Canfield		9026	OPS	ICC
6/11/24	405263	Andre Collins			OPS	I.CC
6-11-24	326261	Joey Hughes		9026	OPS	ICC
6-11-24	351133	Doug Kirby		9026	OPS	ICC

Supervisor/Instructor Kristen H Salkowski (Sign) – *Printed name at top of form*

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TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	ICC TRAINING ROOM
COURSE TITLE:	SWPP	HOURS		INSTRUCTOR(S) (Print)	Kristen Salkowski

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/11/24	293792	Ron Meyers			OPS	
6/11/24		Marcel Harvey			OPS	
					OPS	
					OPS	
					OPS	
					OPS	
					OPS	
					OPS	
					OPS	
					OPS	
					OPS	
					OPS	
					OPS	
					OPS	

Supervisor/Instructor Kristen Salkowski (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	JFK Maint #1
COURSE TITLE:	SWPP	HOURS	1.0	INSTRUCTOR(S) (Print)	Kristen Salkowski

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/4/24	338424	Abel, Matthew	Matthew Abel	9101	OPS	JFK1
6-4-24	407939	Adams, Daequan	Daequan Adams		OPS	JFK I
6/4	322225	Ash, Eric	Eric Ash		OPS	JFK 1
		Bahr, Alexander				
6-4-24	162470	Bennett, David	David Bennett	9101	OPS	JFK I
6-4-24	298384	Bergen, Nick		9101	OPS	JFK 1
		Bobadillo Sanchez, Carlos				
6-4-24	365666	Bratkowski, Dwayne	Dwayne Bratkowski	9101	OPS	JFK-1
6-4-24	338462	Bredehoeft, Joseph	Joseph Bredehoeft		OPS	JFK1
6-4-24	375382	Breedlove, Roger	Roger Breedlove	9101	OPS	JFK1
6-4-24	415507	Burdette, Nicholas	Nicholas Burdette	9101	OPS	JFK I
6/4/24	400879	Burns, Rodney	Rodney Burns	9101	OPS	JFK 1
		Cameron, Lisa				
6-4-24	166591	Cather, Robert	Robert Cather	9101	OPS	JFK
6/4/24	149235	Colon, Larry	Larry Colon		OPS	JFK1
6-4-24	411639	Cooper, Savannah	Savannah Cooper	9101	OPS	JFK 1

Supervisor/Instructor Kristen Salkowski (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	JFK Maint #1
COURSE TITLE:	SWPP	HOURS	1	INSTRUCTOR(S) (Print)	Kristen Salkowski

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/4/2024	393782	Courtney, Shane		9101	OPS	JFK1
6/4/24	344395	Crowley, Justin			OPS	JFK-1
6-4-24	332743	Cummings, Shawn			OPS	JFK1
		Davis, LaPrina				
6-4-24	314428	Dunn, Vincent		9101	OPS	JFK1
6.4.24	298391	Forsythe, Saber		9101	OPS	JFK1
6.4.24	412462	Gallegher, Nicholas		9101	OPS	JFK1
		Gehring, Stephen				
6-4-24	179015	Gibson, Ricky		9101	OPS	JFK1
6-4-24	398060	Glorius, Anthony		9101	OPS	JFK1
		Grace, James				
6-4-24	353335	Grasham, Keith		9101	OPS	JFK-1
6-4-24	333747	Gullion, James		9101	OPS	JFK-1
		Halstead, Gary				
6-4-24	288057	Hoiland, Darrin		9101	OPS	JFK1
6-4-24	383059	Honaker, Daniel		9101	OPS	JFK-1

Supervisor/Instructor Kristen Salkowski (Sign) – *Printed name at top of form*

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TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	JFK Maint #1
COURSE TITLE:	SWPP	HOURS	1	INSTRUCTOR(S) (Print)	Kristen Salkowski

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6/4/24	275942	Isenhart, Phillip			OPS	JFK 1
6/4/24	403085	James, Kenneth		9101	OPS	JFK1
6-4-24	399847	Jaurequi, Zeke		9101	OPS	JFK-1
6-4-24	412155	Jenkins, Robert		9101	OPS	JFK 1
		Kraft, Matthew				
6/4/24	133999	Landry, Edwin		9101	OPS	JFK#1
6/04/24	360098	Lee, Joshua		9101	OPS	JFK #1
		Lee, Larry				JFK-1
6/4/24	410861	Leilich, Kevin		9101	OPS	
		Mason, Antoine				
6/4/24	414647	Merriken, Jackson		9101	OPS	JFK1
6/4/24	299008	Monk, Raymond	Raymond Monk	9101	OPS	JFK1
6-4-24	~~299008~~ 126403	Morkovsky, John	John Morkovsky		OPS	JFK 1
		Mowbray, Andrew				
6-4-24	415408	Murray, Robert		9101	OPS	JFK 1
		Ortt, Charles				

Supervisor/Instructor Kristen H. Salkowski (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	JFK Maint #1
COURSE TITLE:	SWPP	HOURS		INSTRUCTOR(S) (Print)	Kristen Salkowski

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
		Pearce, Arthur				
6-4-24	235495	Power, Joshua	Joshua Powers	9101	OPS	JFK I
		Richards, Nicholas				
6/4/24	419678	Riley, Colin	Colin Riley	9101	OPS	JFK-1
		Saddler, Preston				
6-4-24	164535	Saraullo, Joseph	Joseph Saraullo		OPS	JFK #1
6-4-24	~~310~~ 361033	Sargent, Mark	Mark Sargent	9101	OPS	JFK-1
6.4.24	320511	Schweiger, Zachary		9101	OPS	JFK 1
6/4/24	non 358	Seek, Joshua		9101	OPS	JFK-1
6/4/24	407991	Smith, Dustin			OPS	
		Steffe, Daniel				
6-4-24	378031	Tharps, Adrian	Adrian Tharps		OPS	JFK#1
6/4/24	367264	Wyatt, Jerry	Jerry Wyatt		OPS	JFK 1
6/4/24	407755	Zapata, Abraham		9101	OPS	JFK 1
6/4/24	407403	Zapata, Oscar		9101		JFK 1
6-4-24		Jackson Scott			OPS	JFK2

Supervisor/Instructor Kristen Salkowski (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator (Date)

TRAINING ROSTER - SOP OR OPERATIONS DIVISIONS TRAINING

TYPE: (SOP,Internal,	External Through OESM	COURSE NUMBER:	WO#
TITLE:	SWPP		DATE: 6/4/24
Instructor (s)	Kristie Salkowski		LOCATION: JFK Maint 2
Comments:			
HRS:		51 Employees	

DATE:	EIN#	NAME (Printed)	EMPLOYEE SIGNATURE	RC#	DEPARTMENT
6-4-24	244497	Bowman, Jake		9102	Maintenance
6/4/24	284714	Brown, Don		9102	Maintenance
6-4-24	265478	Caldwell, Wayne	Wayne E Caldwell	9102	Maintenance
	170277	Cebula, Robert.		9102	Maintenance
	407816	Clark, Andre		9102	Maintenance
6-4-24	241816	Colm, James		9102	Maintenance
	298377	Costello, Edward		9102	Maintenance
6-4-24	316156	Davis, John		9102	Automotive
6-4-24	392563	Dawson, Devin		9102	Automotive
6-4-24	407854	Deel, Eric		9102	Maintenance
06-04-24	323178	Fender, Kevin		9102	Automotive
6-04-24	287807	Groh, Matthew		9102	Maintenance
6/4/24	307499	Grove JR, William		9102	Maintenance
6/4/24	407960	Hadden, Robert		9102	Maintenance
	185134	Jackson, Scott		9102	Utilities
6/4/24	155045	Johnston, Eric		9102	Maintenance
6-4-24	407830	**Krauss, James**		**9021**	Maintenance
6-4-24	296427	Little, Michael		9102	Maintenance
	414883	Long, Timothy		9102	Maintenance

Submitted By: _____ Kristie A Salkowski
(signature) Supervisor/Instructor

Entered into LMS By:_____ DATE:_____

DATE:_____

TRAINING ROSTER - SOP OR OPERATIONS DIVISIONS TRAINING

TYPE: (SOP,Internal,		COURSE NUMBER:	WO#
TITLE:			DATE:
Instructor (s)	Kristie Salkowski		LOCATION: JFK Maint 2
Comments:			
HRS:		51 Employees	

DATE:	EIN#	NAME (Printed)	EMPLOYEE SIGNATURE	RC#	DEPARTMENT
6/4/24	247498	**Marcum, Charles**		**9021**	Maintenance
6/4/24	357920	Marston, Triston		9102	Maintenance
6-4-24	161367	**May, John**	MAY	**9021**	Maintenance
	264785	Mayes, Charles		9102	Maintenance
6-4-24	164849	Monk, James (Bryan)		9102	Utilities
	165228	Napier, Karen		9102	Maintenance
	405645	Neff, Zachary		9102	Maintenance
6.4.24	317870	Osborne, Lisa		9102	Maintenance
	163385	Philhower,Butch		9102	Maintenance
	400176	Pugh, Kate-Lynn		9102	Maintenance
6-4-24	257817	Quinn, Michael		9102	Utilities
6-4-24	309554	**Rea, James**		**9021**	Maintenance
6/4/24	223782	Reagle Edward		9102	Utilities
6-4-24	150934	Saunders, Frank		9102	Maintenance
6-4-2024	306072	Seymour, Todd		9102	Automotive
6/4/24	295512	Schanding, Ricky		9102	Maintenance
6.4.24	261630	Shaw, Greg		9102	Maintenance
6-4-24	310796	Shew, George		9102	Utilities
6-4-24	363099	Shreve, Shawn		9102	Maintenance

Submitted By: _____

Kristen H Salkowski
(signature) Supervisor/Instructor

Entered into LMS By: _____ DATE: _____

DATE: _____

TRAINING ROSTER - SOP OR OPERATIONS DIVISIONS TRAINING

TYPE: (SOP,Internal,		COURSE NUMBER:	WO#
TITLE:			DATE:
Instructor (s)	Kristie Salkowski		LOCATION: JFK Maint 2
Comments:			
HRS:		51 Employees	

DATE:	EIN#	NAME (Printed)	EMPLOYEE SIGNATURE	RC#	DEPARTMENT
6/4/24	152723	Shue, Raymond		9102	Maintenance
	406048	Smith, Paul		9102	Maintenance
	416566	Smith, Robert		9102	Utilities - Mason
6/4/24	415583	Smith, Timothy		9102	Maintenance
6/4/24	214735	Snyder, David		9102	Maintenance
6/4/24	413763	**Stamper, Renee**		**9021**	Maintenance
	303538	Stumpf, Christopher		9102	Maintenance
6/4/24	415934	Taveras, Aaron		9102	Maintenance
6/4/24	143318	Taylor, Curtis		9102	Maintenance
	347570	Trego, James		9102	Automotive
6-4-24	367257	Weiderhold, Amy		9102	Maintenance
6-4-24	397988	White, Jacob		9102	Maintenance
6/4/2024	397971	Willey, Daniel		9102	Maintenance

Submitted By: _____

Kristen M Salkowski
(signature) Supervisor/Instructor

Entered into LMS By: _____ DATE: _____ DATE: _____

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	WPL Maintenance BLDG
COURSE TITLE:	Annual Stormwater Pollution Prevention Training	HOURS		INSTRUCTOR(S) (Print)	Melissa Hess

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
5/30	373654	Steven Dyott		9041	Operations	WPL
5/30	418216	Davon Jones		9041	Operations	WPL
5/30	354906	Devin James		9041	Operations	WPL
5/30	419819	Andrea Chester		9041	Operations	WPL
5/30	392792	ALLAN STRACKE		9041	Operations	WPL
5/30	338400	Brian Lowery		9041	Operations	WPL
5/30	408431	Isaiah Horsey		9041	Operations	WPL
5/30	327657			9041	Operations	WPL
5-30	333542			9041	Operations	WPL
5-30	294775			9041	Operations	WPL
5/30	375696	Michael Hermann Jr		9041	Operations	WPL
5/30	340991	Phil Collins		9041	Operations	WPL
5-30	380638	James Rasser		9041	Operations	WPL
5-30	366659	Joseph Williamson		9041	Operations	WPL
5-30	395113	Robert Dellinger		9041	Operations	WPL
5-30		Kelvin Epp		9041	Operations	WPL

Supervisor/Instructor _____ ENTERED INTO LMS BY: _____

(Sign) – *Printed name at top of form* Coordinator (Date)

TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:		TRAINING LOCATION	WPL Maintenance BLDG
COURSE TITLE:	Annual Stormwater Pollution Prevention Training	HOURS		INSTRUCTOR(S) (Print)	Melissa Hess

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
5/30/24	363143	Kyle Simpson	Kyle Simpson	9041	Operations	WPL
5/30/24	281928	Alan Plutschak		9041	Operations	WPL
5/30/24	398367	Brendan Ray	Brendan Ray	9041	Operations	WPL
5-30-24	402908	Christian Fernandez	Christian Fernandez	9041	Operations	WPL
5/30	—	Ben Schmitt	B. Schmitt	9041	Operations	WPL
5/30/24	337663	Chris Krysiak		9041	Operations	WPL
5/30/24	303132	William Brown	William Brown	9041	Operations	WPL
5/30/24	290135	EAN Brown		9041	Operations	WPL
5/30/24		Scott Hasselberger		9041	Operations	WPL
5-30-2024		Russell Cornish		9041	Operations	WPL
5-30-24	240659	D. CARVALHO		9041	Operations	WPL
5-30-24	261-036	H. Coleman		9041	Operations	WPL
				9041	Operations	WPL
				9041	Operations	WPL
				9041	Operations	WPL
				9041	Operations	WPL

Supervisor/Instructor M Hess
(Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____
Coordinator (Date)

Appendix A.5 - Natural Resources Training/ Outreach

Maryland Transportation Authority Invasive/Noxious Species Management and Control Plan

1

Introduction

- The Maryland Transportation Authority (MDTA) manages multiple storm water management facilities including but not limited to ponds, sand filters, and wet basins throughout Maryland. Vegetation growth can limit the effectiveness of these features by reducing available volume and impeding flow to the risers. Control of vegetation within the ponds is a necessary practice for the storm water management facilities to remain viable. Much of the vegetation found within the storm water management facilities can be defined as noxious and/or invasive.

2

Topics

- Classification of Weeds: Weeds, Exotic Invasive, Noxious
- Know Your Targets: Main players
- Vegetation Management Program: IVM
- Pesticide Compliance
- Weed Control Plan: Customized by Target

3

3 Million Dollar Questions Classification

- What are Weeds?
- What are exotic invasives?
- What are noxious weeds?

4

Answer



Anyone?

Anyone?

Bueller ?

5

What are Weeds?

- Plant out of place
- Can produce allelopathic substances that are toxic to desired plants
- Out compete desired vegetation by robbing water, light, space, and soil
- They can be invasive when population exceeds thresholds

6

What are exotic invasive plant species?

- Exotic Invasive plant species are "alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health". The Maryland Invasive Species Council encourages efforts that prevent the introduction of invasive species on Maryland ecosystems, while also managing the impact of the existing species.
- A lists all aquatic and terrestrial invasive plant species of concern, can be found on the following website:

http://www.mdinvasivesp.org/Invasive_Species_of_Concern_in_Maryland.pdf

7

What are noxious plant species?

- Noxious weeds are plant species that are a threat to agriculture or natural lands and are usually considered undesirable, competitive, persistent, aggressive, and they tend to form a monoculture, or are invasive species. Maryland State Law requires that weeds considered as 'noxious' be controlled by anyone owning or managing land within the state. A list of all plant species that are considered noxious, can be found at the following website:

http://mda.maryland.gov/plants-pests/Pages/noxious_weeds_in_md.aspx

8

Know Your Targets

- Species Typically Found during SWPPP Inspections:



9

Know Your Targets









10

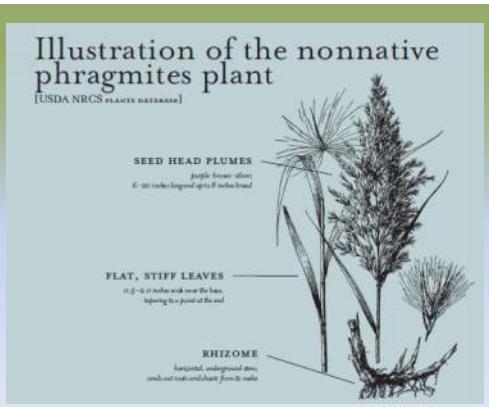
Phragmites (Phragmites australis)

Nuisance weed

- Perennial
- 15' tall
- Dense monoculture that can turn a wet pond into a dry pond
- Roots are several feet deep and extend out horizontally 30'/year
- Purple or golden flowers in panicles
- Flower times late summer into fall
- Seeds profusely



11



12

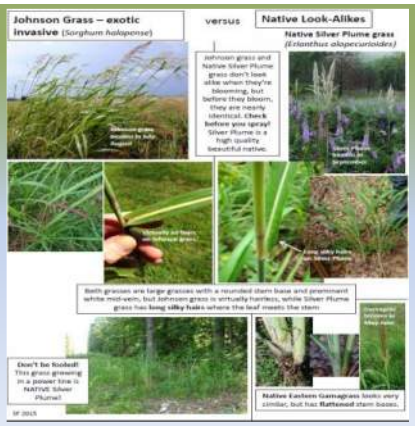
Johnsongrass (Sorghum halepense)

Noxious

- Perennial
- Tall and coarse with stout ¾" rhizomes.
- Grows in clumps
- 8' height
- Leaves- smooth 6-20" long emerge late spring
- Seed formation- reddish brown. Starts flower from Late June - Aug



13



14

Japanese Knotweed (Fallopia japonica)

Exotic invasive

- Perennial
- Starts as a low growing mat-like growth of stems from one taproot that can grow 13' in season
- Hollow stems similar to bamboo; grows up to 10' tall
- Flower: small, cream or white in August – early Fall
- Reproduces from heavy rhizomes but does produce viable seed



15



16

Canada thistle (Cirsium arvense)

Noxious

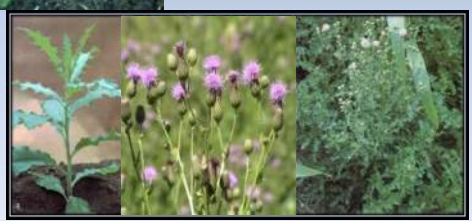
- Perennial
- Erect tall cluster of extremely spiky leaves first year
- 2nd Year ; grows to 5' tall with typical pinkish/purplish flowers
- Reproduces from seed or rhizomes
- Roots can be as deep as 20' and extend 17' horizontally
- Flowers in June



17



Other thistles:
Bull and Musk



18

Vegetation Management Program Control Methods

- Chemical Control
- Mechanical Control
- Biocontrol
- Sanitation Controls
- Cultural Control

19

Vegetation Management Program

Integrated Vegetation Management (IVM)

Based on clearly defining what species are weeds or what are the targets, how many have to be present before control operations are necessary, and what combination of methods give the best results

Mechanical + Chemical = Desired Outcome



20

Vegetation Management Program Pesticide Compliance

Pesticide Use

- The Maryland Department of Agriculture (MDA) is responsible for regulating the sale, use, storage, and disposal of pesticides and for enforcing the Maryland Pesticide Applicators Law. MDA is responsible for establishing guidelines and requirements for the application of pesticides, the certification of pesticide applicators and the licensing of businesses to ensure that pesticides are applied properly by competent individuals.

21

Certification or Registration

- A certified pest control applicator is required to be present or reachable during a scheduled control event. In order to become certified as a pest control applicator, an individual must be at least 18 years of age and have at least one year of practical pesticide application experience as a registered employee in the category, or categories, in which they want to become certified. A degree in a biological field may qualify in lieu of experience. The individual must pass examinations administered by the MDA to be certified in specific categories. Aquatic (category 5) and Right of way (category 6) certifications are required to apply pesticides around and within storm water management structures.

22

Certification or Registration

- **Registered Employee**
- Each pesticide licensee or permittee is responsible for ensuring that each employee involved in pest control sales, service, or inspections completes a training program approved by MDA on pesticide use and safety. The purpose of the training is to instruct an individual in the principles of pest control and the proper use of pesticides to ensure they are competent to identify pest problems and to handle and apply pesticides in order to prevent harm to themselves, others, animals or the environment. An **employee must receive and complete the training within 30 days of a business, or agency**, obtaining a business license or permit, initial employment or changing job duties that will involve pest control sales, service or inspections. The training, at a minimum, must consist of the following topics and concepts:
  - Pesticide laws and regulations;
  - Pesticide label comprehension;
  - Safety and emergency procedures;
  - Pest identification and control recommendations;
  - Pesticide application techniques;
  - Environmental and health concerns; and
  - Integrated pest management principles.

23

Compliance

2 Broad classifications of pesticides

- General Use pesticides: may be purchased at a retail outlet and used by the general public
- Restricted use pesticides: can only be applied/handled by (or under the direct supervision of) a certified applicator.

24

Compliance
Pesticide Storage

- Locked in well ventilated area
- Products are all labeled
- Spill prevention kits or enough absorbent for largest sized container spill shall be stored nearby
- Storage area should be inspected weekly for preventative spill measures

25

Pesticide Compliance
Toxic Materials Permits – Industrial Discharge

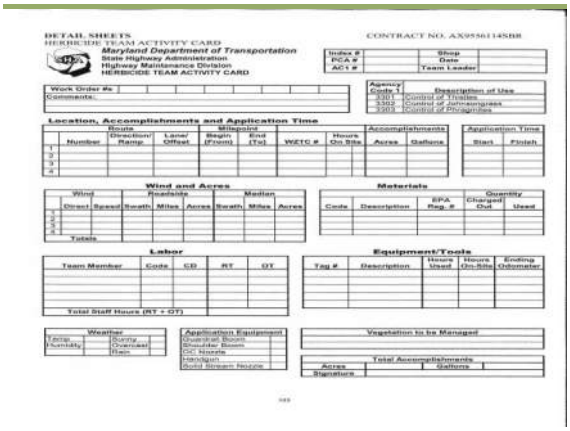
- TMP is required for the control of nuisance aquatic life in waterways (i.e.ponds) by the use of herbicides
- Issued by MDE prior to application to allow for the use of pesticides
- Permit can last up to 3 years
- Takes 45 days to turnaround permit

26

Pesticide Compliance
MD General Discharge Permit No. 11PE (NPDES No.MDG87)

- Similar to Toxic Materials Permit
- Regulates discharges from pesticides applied directly to surface waters to control pests
- Designed to limit excess pesticide discharge by implementing an IPM or IVM

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DETAIL SHEETS
HERBICIDE TEAM ACTIVITY CARD
CONTRACT NO. AX9558114SB8
Maryland Department of Transportation
State Highway Administration
Highway Maintenance Division
HERBICIDE TEAM ACTIVITY CARD
Index #
PCA #
ACT #
Shop
Date
Team Leader
Work Order #s
Comments:
Agency Code
Description of Use
3301 Control of Thistles
3302 Control of Johnsongrass
3303 Control of Phragmites
Location, Accomplishments and Application Time
Route
Number
Direction/ Ramp
Lane/ Offset
Milepoint
Begin (From)
End (To)
WETC #
Hours On Site
Accomplishments
Acres
Gallons
Application Time
Start
Finish
Wind and Acres
Wind
Direct
Speed
Roadside
Swath
Miles
Acres
Median
Swath
Miles
Acres
Totals
Materials
Code
Description
EPA Reg. #
Quantity
Charged Out
Used
Labor
Team Member
Code
CD
RT
OT
Total Staff Hours (RT + OT)
Equipment/Tools
Tag #
Description
Hours Used
Hours On-Site
Ending Odometer
Weather
Temp
Humidity
Sunny
Overcast
Rain
Application Equipment
Quarter-jet Boom
Shoulder Boom
DC Nozzle
Handgun
Solid Stream Nozzle
Vegetation to be Managed
Total Accomplishments
Acres
Gallons
Signature

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Pesticide Compliance

- PPE: Label is the law. Follow the label at minimum.
- GHS/SDS: Global Harmonizes System; If you still have a binder with MSDS you may be out of compliance as your product is either too old and/or may be banned now in the US
- Always have the label with you during pesticide operations. It's the law!

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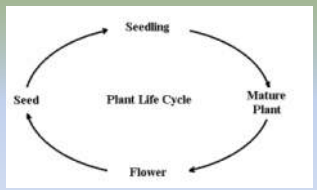
Pesticide Compliance

- Use only Aquatic Labeled pesticides during operations in or adjacent to waterways
- Application rates are on the label. Label is the Law.
- Weather conditions should always be observed prior to and during application
- Most pesticides need at least 2 hours to dry
  - Do not spray when wind is equal to or greater than 10MPH. Use drift control adjuvant
  - Spray with not against the wind

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Weed Control Plan

Life Cycle of Weeds



Johnsongrass: Late June to Early August
Phragmites: Late August to First Frost
Japanese Knotweed: July – Sept.
Thistle: Late May – Mid June

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Weed Control Plan

Herbicide Pallete

Selective	Non-Selective	PGR
2,4-D amine Basal/stump Clopyralid Fosamine Mesulfuron-methyl Tricloypyr	Glyphosates Oryzalin Imazpyr	Chlorsulfuron Mefluidide –



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Phragmites Weed Control Plan

Operation Process

- Non selective systemic herbicide (aquatic glyphosate or imazapyr)
- Apply during flowering period before seed dispersal
- Follow up mowing operation or weed eating in Winter
- Dispose of material off site carefully. Seed is viable
- Monitor in for re-sprout in late Spring for follow up treatments.

Phragmites (Late Aug – Mid Oct)



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Johnsongrass Weed Control Plan

Operation Process

- Non selective systemic herbicide (glyphosate)
- Option 1)Apply prior to flowering period before seed dispersal than follow up with mechanical mow
- Option 2)Manually pull out once plant material is at least 18" in height prior to flowering.
- Follow up mowing operation or weed eating as soon as 3 weeks after herbicide application
- Monitor in for re-sprout or new stands in late Spring for follow up treatments.

Flowering Time (June – Early August)



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Japanese knotweed Weed Control Plan

Operation Process

- Best method is to foliar spray in august followed by digging out but stands typically infiltrate stream banks
- Cut infestations once or twice during growing season to keep plants low and reduce vigor
- Apply foliar spray to leaves of resprouting stems beginning in August using glyphosate (rodeo), imazapyr (Arsenal) or triclopyr (Garlon 3A) with surfactant; may need blue dye. DO NOT DISCARD PLANT MATERIAL INTO STREAM; DISPOSE OF PLANT MATERIAL OFFSITE
- Monitor in for re-sprout or new stands in late Spring for follow up treatments FOR 3 YEARS.

Flowering Time (July – Sept)


Abandoned house being engulfed by Japanese knotweed in Savage, MD

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Thistle Weed Control Plan

Operation Process

- Selective herbicide clopyralid (Transline).
- Apply during flowering period before seed dispersal
- Follow up Mow in late summer and fall
- Monitor in for re-sprout in late Spring for follow up treatments.
- If herbicide operations are unrealistic; be sure to mow thistle prior to seed dispersal

Canada thistle (Late May – Mid June)



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Questions



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INVASIVE: Ailanthus altissima, commonly known as **tree of heaven**, **ailanthus**, or in Standard Chinese as ***chouchun*** "foul smelling tree", is a deciduous tree in the Simaroubaceae family. It is native to both northeast and central China, as well as Taiwan. Unlike other members of the genus *Ailanthus*, it is found in temperate climates rather than the tropics. The tree grows rapidly and is capable of reaching heights 49 ft in 25 years.



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MANAGEMENT OPTIONS AND TOOLS

Mechanical Control

- After the chemical treatment, one month or more after the chemical has worked throughout the plant to the root system, staff may use the mechanical control method of weed whacking, to remove the leftover plant material. Disposing of the leftover plant material ensures that you are containing the seed source.

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MANAGEMENT OPTIONS AND TOOLS

Disposal Technique

- To ensure that leftover plant material does not create a seed source, the materials should be transported to an appropriate disposal facility that will accept organic materials. The plant material should be tied together and placed in a flat bed truck or trailer secured with a tarp to prevent the loss of materials during transport. A Waste-to-Energy [Incinerator] Plant owned by Wheelabrator Baltimore, L.P. is recommended to avoid any possible spreading of the plant. Wheelabrator accepts the material at a cost per ton. When controlling invasive plants within storm water management ponds, tonnage is typically minimal. Municipal solid waste landfills will also accept invasive plants if they were removed from the same county as the landfill.

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MANAGEMENT OPTIONS AND TOOLS

Disposal Technique



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MANAGEMENT OPTIONS AND TOOLS

Follow up Visits

- It is anticipated that consecutive applications of herbicide will be required for additional invasive species control as usually only a percentage is eliminated with each successful application due to adjacent seed sources not being treated, weather and other factors. Therefore, it is recommended follow up site visits be performed every year after the application. During the site visits, it will be determined how effective the previous year's application was and what type of control (chemical, and/or mechanical) is needed for future control.

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Natural Resource Mitigation Accomplishments 2023

(01 JULY 2022 – 30 JUNE 2023)

Office of Engineering & Construction – Environmental Division

Environmental Manager:
Peter Mattejat, MDTA

Natural Resource Lead:
Julie McCarthy, MDTA

Natural Resources Mitigation Consultants:
Nikki Radke, WSP
Michael Greenberg, Straughan
Chelsea Connor, JMT
Aaron Brown, WSP
Chad Hoekzema, WSP
Shannon Pursell, Coastal Resources
Jake Barben, Wallace Montgomery

Maryland Transportation Authority

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Executive Summary

The Natural Resources (NR) Mitigation Division (Division) of Maryland Transportation Authority (MDTA) manages assets related to construction projects, landscape operations, permitting compliance of all impacted natural resources, mitigation management and monitoring reporting for all projects, compliance tracking as well as actively maintaining routine maintenance work orders (WO). The NR assets are tied to environmental permits used for either advanced credit to offset environmental impacts and/or in-kind mitigation based on such impacts involving varying regulatory environmental agencies that require monitoring, reporting, and compliance based on performance conditions set forth by the regulators.

Fiscal Year 2023 (FY23) Overview

The Division supported the installation and maintenance of mitigation plantings and related vegetation management MDTA-wide. This involved best practices for planting establishment and pesticide / vegetation management based on the MDOT Standard Specifications for Construction. Activities included:

- Reviewed 15 capital erosion and sediment control, landscape, reforestation, and stormwater plans.
- Installed plant materials for 12 contracts (23 site locations), followed by installation and establishment support. The following plant material was installed:
    - Trees – 2,064
    - Shrubs - 407
    - Herbaceous materials – 2,698
    - Livestakes – 6,058
- Monitored all Category 700 plant materials for 39 contracts (72 site locations) to meet permit requirements and compliance.
- Closed 10 contracts under warranty at 32 site locations.
- Treated 9+ acres of invasive species, with bulk at White Marsh Run mitigation site (~5 ac).
- Pesticide Calibration Training for Maintenance Facilities held in May 2023
- Developed the Rapid Mitigation Dashboard to review and track monitoring results more efficiently.
- Collected spotted lanternfly (*Lycorma delicatula*) data (e.g., locations of egg masses, stage 3 or 4 adults, and general spread) and referred this data to USDA for treatment at Travel Centers and JFK-II campus/shop.
- Supported the Design Team and the Drainage Investigation Team with project closeouts or tree surveys to amend permits based on redline or field construction changes.

Projects

Rapid Mitigation Dashboard

The Rapid Mitigation Dashboard was created to tie together the data collected from the various NR Mitigation survey applications used to monitor wetlands, waterways, and reforestation projects and summarizes the data to provide an overall performance grade. In turn, this information provides managers with advice about remedial maintenance activities, allowing for forecasting the budget.

MDNR/Baltimore City Roadside Trees

Supported the I-95 Express Toll Lane (ETL) program with involvement in two projects (KH-3019 and KH-3009) at 10 site locations which were planted in FY23 requiring reforestation or roadside tree mitigation. All other projects for reforestation and roadside tree mitigation were monitored both during and after warranty periods.

MDE Bay TMDL Restoration – Trees

Monitoring for MA-3008 Best Management Practices (BMP) Retrofits Phase VI and MA-3004 Chesapeake Bay TMDL Design Services Bioswale Design I-895 and I-895 Spur occurred.

Other Tree Banks

The Division monitored four tree bank sites in Harford County planted by JFK Operations with an overall ~76% survivorship.

Critical Area Commission Mitigation

There are currently five bank sites that MDTA actively monitors and maintains (~866 trees) out of the nine total banks that MDTA owns. The bank sites are in the monitoring phase of their warranty and are anticipated to be released by the Critical Area Commission (CAC) after 5 years. Two banks will be ready for close-out in Q3 and Q4 FY24. These are monitored every year to determine maintenance for long-term success. The Potee Street and Bay Bridge CAC banks both received invasive treatments in FY23.

Additionally, shrubs and herbaceous grasses were installed at the Francis Scott Key (FSK) bridge Step Slope and Site Restoration Project for the Critical Area buffer in December 2022. Before installation, the area was treated for invasives (~0.23 ac) in November including Japanese knotweed (*Polygonum cuspidatum*), Canadian thistle (*Cirsium arvense*), phragmites (*Phragmites australis*), Oriental bittersweet (*Celastrus orbiculatus*), Japanese honeysuckle (*Lonicera japonica*), and tree of heaven (*Ailanthus altissima*).

MDE/USACE Compensatory Mitigation

The focus in FY23 was to perform increased monitoring at all mitigation sites and invasive treatment to ensure mitigation credits. Activities included:

- White Marsh Run (mitigation site for ETL 100) – The Division continued invasive management focusing on removal of widespread phragmites (*P. australis*) stands (~4.3 acres), and Asiatic tearthumb (*Persicaria perfoliata*; ~5.18 acres). Regular watering occurred bi-weekly throughout the growing season as well as regular site monitoring. Major activities:
    - September 2022 – Treated invasive vegetation.
    - April 2023 – Installed bat and bird boxes.
    - May 2023 – Treated invasive vegetation.
    - June 2023 – Installed ten replacement trees.

- HT-3012 / Unnamed Tributary of Patapsco River (mitigation site for ETL 200) – The Division provided rapid inspection monitoring throughout the year, and invasive treatment occurred in November 2022 and March 2023 to control phragmites (*P. australis*) and Amur peppervine (*Ampelopsis brevipedunculata*). Invasive brush [i.e., multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*L. japonica*), and tree of heaven (*A. altissima*)] was cleared within the right-of-way (ROW) to create an access road and prevent spreading of invasives into the project site. Drone footage was captured and labeled with stationing that will be used as a reference for post-construction monitoring to show real time site status and check for concerns (e.g., structure failures). Some drone footage is bundled for agency review of site conditions. Lastly, bird houses were installed on site (see Photo 2), as well as a clean-up day (see Photo 1) for trash that had collected in the floodplain from frequent storms in spring 2023.



Photo 1: Collected trash.



Photo 2: Installed bird house.

- KB-2708 / FSK ETL (mitigation site for ETL 200) – The Division monitored the site year-round and treated ~0.59 ac for Phragmites. The Division installed tree protection cages around existing plantings.
- KH-3028 / Unnamed Tributary to Carsin's Run (mitigation site for ETL 200) – The Division performed rapid inspection monitoring throughout the year, and completed remedial activities of fallen tree removal from planted area and invasive species treatment (~0.37 ac) for Japanese honeysuckle (*L. japonica*), multiflora rose (*R. multiflora*), Japanese barberry (*Berberis thunbergii*), and privet (*Ligustrum* sp.). Monitoring teams have noted that some of the bed materials have washed away, indicating stream construction will need attention in the future. Drone footage was captured and labeled with stationing that will be used as a reference to for post-construction monitoring to show in real time how the site is doing and any site issues (e.g., structure failures). Some drone footage is bundled for agency review of site conditions.

Wildlife

As part of mitigation monitoring, wildlife field cameras were installed at various sites across MDTA projects. The cameras provide information on site performance, ecological uplift, and show the types of wildlife that return to project sites in part due to the mitigation or restoration; cameras also provide monitoring of trespassing occurrences. Bat and bird boxes were installed at the Whitemarsh Run and HT-3012 sites to encourage more biodiversity.

FY23 Assets

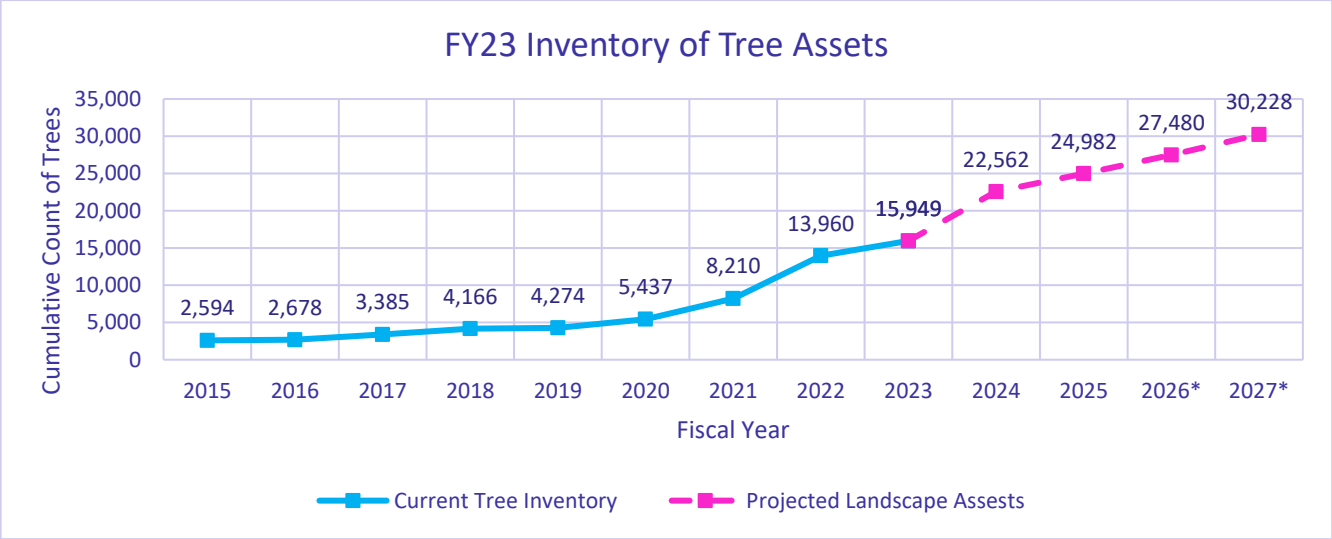


Figure 1. Cumulative tree counts through FY23 (blue). Projected tree counts (pink) are based on both plan reviews anticipated to go to construction in future fiscal years (this is subject to change) and an estimated 10% increase as noted by the astrisk (*) .

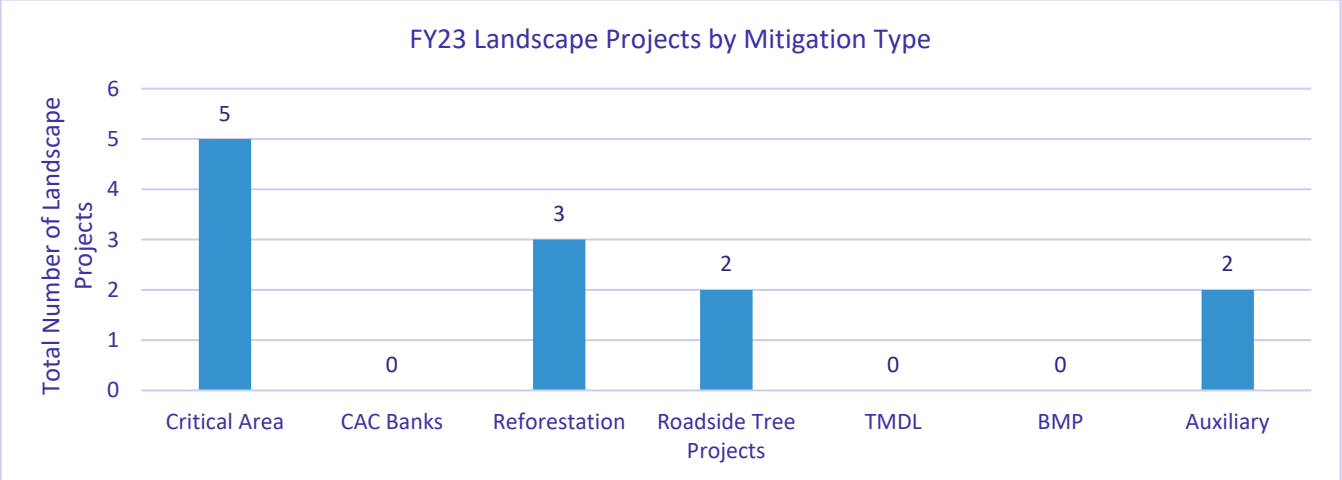


Figure 2. The total of 12 landscape projects installed in FY23 by their mitigation type.

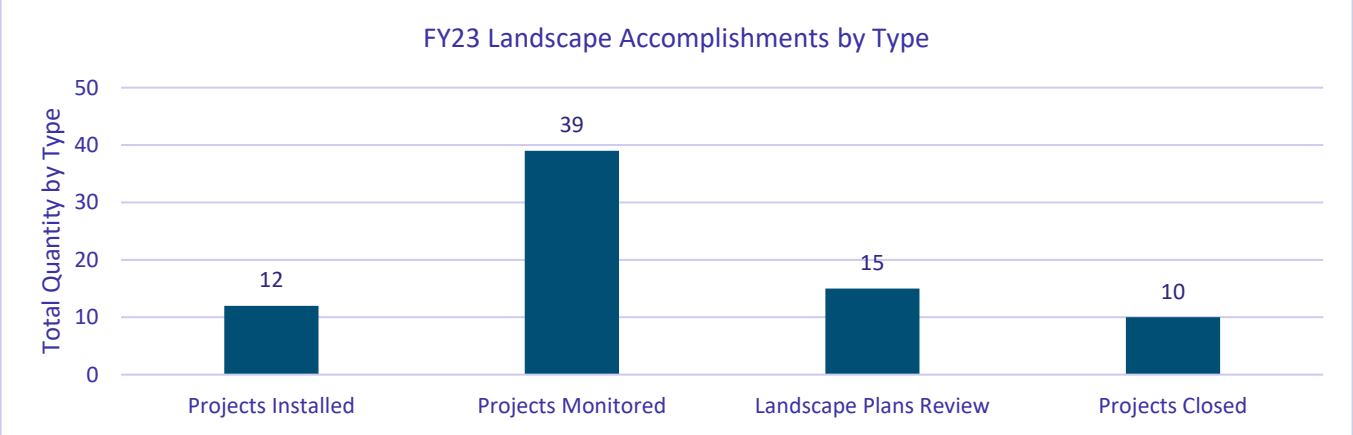


Figure 3. The total number of accomplishments by type completed by the Mitigation Division in FY23.

FY23 Project List and Activities

Project ID	Program	Project Title	Trees	Shrubs	Herbs	Reviewed	Installed	Monitored	Closed
AA-CAC-RB-WPL-001	CAC Bank	Bay Bridge CAC Bank	15	0	0			✓	
BA-CAC-RB-BHT-002	CAC Bank	Frankfurst CAC Bank	17	28	0			✓	
BA-CAC-RB-FSK-002	CAC Bank	Patapsco Flats CAC Bank	278	0	0			✓	
BA-CAC-RB-FSK-003	CAC Bank	FSK ETL CAC Bank	433	822	0			✓	
BC-CAC-RB-BHT-001	CAC Bank	Potee St. CAC Bank	487	0	0			✓	
BC-CAC-RB-FMT-001	CAC Bank	Western Ave CAC Bank	123	0	0			✓	
HA-CAC-RB-TJH-001	CAC Bank	Hatem Bridge CAC Bank	10	0	0			✓	
BB-2757	CAC	Electrical Improvements	9	0	0			✓	
BB-3014	CAC	WPL Emergency AET Conversion	337	0	0		✓	✓	
BB-5553-0002	CAC	AA Riverside Park	21	90	0			✓	
FT-3009	CAC	Superstructure Repairs	22	10	0		✓	✓	
HB-2594	RTP	TJH Toll Plaza Pavement Rehab & ETL	6	43	958			✓	
HT-2843-0006	REF	I-895 BHT Slope Stabilization at MM 3.6	19	0	0			✓	
HT-3012	REF	Stream Restoration	1,130	1,650	0			✓	
HT-694-0006	RTP	Replacement of Canton Viaduct	186	674	7,095				✓
KB-2708	CAC	FSK ETL	303	451	0			✓	✓
KB-3005	RTP	I-695 Repairs and Subgrade Rehab on Sparrows Point Near Bear Creek	0	82	0	✓			
KB-3040	RTP	MD-24 & Signer Rd	312	0	9196	✓			
KH-3009	REF	I-95 ETL Ext. from MD-43 to South of MD-152	2,831	246	20,496	✓	✓	✓	
KH-3011	RTP	CSX Bridge Replacement I-95	TBD	0	0	✓			
KH-3013	REF	Joppa Road Noise Wall	146	0	0			✓	
KH-3019	REF	I-95 ETL NB Ext: MD-152 Interchange	862	0	0		✓	✓	
KH-3023	RTP	MD-24 at MD-924 Park & Ride - Part 2	199	319	12,959		✓ (Part 2)	✓ (Part 2)	
KH-3024	REF	Belvidere	TBD	TBD	TBD	✓			
KH-3025	REF	New JFK-Maintenance Facility	210	0	0	✓			
KH-3028	REF	Carsin's Run Stream Mitigation	400	312	0			✓	
KH-3029	REF	I95 ETL Abingdon Overpass Replacement	8	44	0		✓	✓	
KH-3030	RTP	ETL NB Ext SB I-95 Noise Wall - MD 24 Woodsdale	137	0	0	✓			
KH-3035	REF	Off-Site Reforestation Raphel Rd	4,880	0	0			✓	
KH-3040	REF	MD-24 NB Auxiliary Lane from MD924 through Singer Rd	312	0	9,196	✓			
KH-3045	RTP	JFK Main Turnpike Facility	TBD	0	0	✓			
KH-3046	REF	I-95/I-695 Interchange Express Toll Lanes	510	0	0	✓			
MA-0967	Auxiliary	EJP Mitigation	3	0	0		✓	✓	✓
MA-0967	Auxiliary	Charlestown Crossing	22	50	0		✓	✓	

MA-3004	TMDL	TMDL Enhancement of Pre-200 SWM BPMs	31	64	3,259			✓	
MA-3008	TMDL	BMP Retrofits Phase VI	356	0	1,360			✓	
MA-3015	RTP	Small Drainage Rehab	148	0	0				✓
MA-3018	RTP	Drainage Outfall Rehabilitation	299	29	0	✓			
MR-3007-0043	RTP	Drainage - Buried Outfalls and Clogged Inlets	17	0	0	✓			
MR-3017-0001	REF	Drainage - Quarantine Rd	98	0	0	✓			
MR-3017-0024	RTP	60" Culvert Outfall Channel Stabilization	18	0	0			✓	✓
MR-3017-0037	RTP	Drainage - Outfall Erosion	24	0	0			✓	✓
MR-3017-0038	RTP	Gravel Access Path Washout	11	0	0			✓	✓
MR-3017-0040	RTP	Drainage - Channel Erosion Repair and Stabilization	52	33	0			✓	✓
MR-3017-0044	RTP	Drainage - Concrete Ditch Failure and Erosion at 48" CMP Culvert	34	0	0			✓	✓
MR-3017-0059	CAC	Drainage - Slope Erosion and Exposed Electrical	55	0	0	✓			
MR-3022-2030	RTP	Erosion Remediation at I-895 and Herring Run	22	0	0			✓	
MR-3025-2091	RTP	Slope Erosion and Exposed Electrical	55	0	0		✓	✓	
MR-3025-2572	RTP	MA-3015 Sink Hole	10	0	0			✓	
MR-3025-2760	CAC	FSK STEP Slope and Site Restoration Project (Shore Buffer Area)	0	255	2,698		✓	✓	
NB-0543	REF	Bowling Property	157	1,123		✓			
NB-0543	CAC	NB Bridge Replacement	186	0	0		✓ (partial)	✓	
NB-3003	CAC	NB Campus Improvement	18	0	0		✓ (partial)	✓	
none	Auxiliary	JFK - I-95 NB MM 89	272	0	0			✓	
WMR	Auxiliary	White Marsh Run Mitigation Site	132	0	0			✓	
					Totals:	15	12	39	10

Table 1. The list of projects active for the Mitigation Division in FY23.

RTP – Roadside Tree Permit, MD Department of Natural Resources
REF – Reforestation Law, MD Department of Natural Resources
CAC – Credit for trees planted in Critical Area, MD Department of Natural Resources
CAC Bank – Credit for trees planted according to the CAC MOU requiring 5-years of monitoring
Capital – MDTA Capital Projects
Auxiliary – Plants installed not associated to a permit/program type.
TMDL – Total Maximum Daily Load Credits, MD Department of the Environment

Other Accomplishments

Training and Outreach

In FY23, the NR Division provided in-person training as shown below in Table 2. This training took place with industry representatives at the Fort McHenry Tunnel (FMT) facility to instruct Operations staff on how to properly calibrate equipment during pesticide application.

Training Topic	Trained	Completed
Pesticide Calibration Training	All Maintenance Facilities	05/03/2022

Table 2. The list of training provided by the Mitigation Division in FY23.

GIS

Natural Resources Geodatabase

In FY23, Mitigation Division staff consistently updated features as construction projects occurred for the most-up-to-date data. Focus on monitoring efforts were made possible with Survey123 forms and ArcGIS field maps for report delivery. A Needs Assessment for Asset Tracking and Analysis was developed to better track assets and implementation will occur in FY24 to enhance current workflows.

Inspections

Survey123 adjustments, report templates, and protocol documents were developed for the Rapid Assessment surveys for stream, wetlands, and vegetation. An ArcGIS dashboard was created to display these results year-to-year.

Reporting

Implementing Microsoft Power Automate for our workflow was a strategic decision aimed at streamlining and enhancing our post-survey processes. By integrating Power Automate with ArcGIS Survey123, the inspection team can submit surveys seamlessly while ensuring that crucial follow-up actions are triggered automatically. Power Automate provides automatic email notifications, ensuring that key stakeholders are promptly informed of survey submissions. This expedites communication, minimizes reliance on manual intervention in the notification process, enhances the overall efficiency of inspection procedures, and creates a more responsive and agile system. As a result, more time and resources can be diverted to value-added tasks.

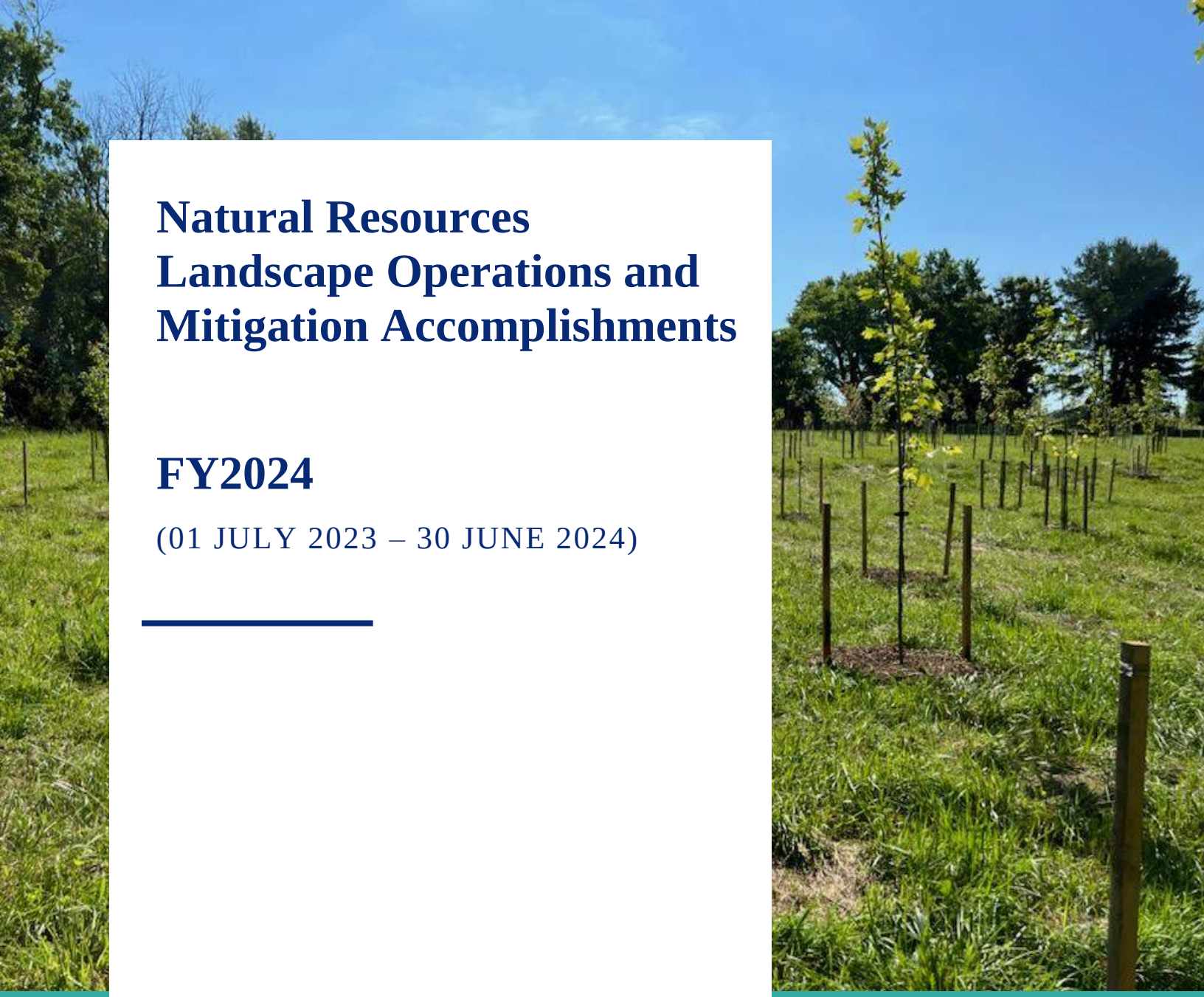
Future Activities

Apart from continuous support for Mitigation Projects, goals for the upcoming FY24 include:

1. Renew the 2-year Tree Commodities Contract for $50,000 which allow MDTA to have first right of refusal from locally Minority Business Enterprise (MBE) sourced tree grower at a reduced rate per tree purchase.
2. Prepare work orders for the upcoming MR-3030 contract. This will be a landscape crew day contract designed to handle NR mitigation based on outcomes from the Rapid Mitigation Dashboard and supplement future needs of the program.
3. Review Construction Compliance inspection surveys to improve workflows from field to desktop and fix identified issues.
4. Close two CAC banks: Patapsco Flats (MR-2859-1224) and Western Ave (Auxiliary project).
5. Streamline project tracking by consolidating activities through GIS to provide real-time updates on construction progress. This will ensure seamless cross-departmental communication for efficiency and transparency.
6. Use Power Automate email notifications to support the Needs Assessment for asset tracking.
7. Implement a Needs Assessment for Asset Tracking and Analysis to enhance current workflows on site selection, invasive species mapping, drone footage, and corridor management.
8. Continue spotted lanternfly (*L. delicatula*) coordination with USDA so they can continue their treatments at various MDTA locations at no cost to the program.
9. Training for the following topics:
    - Invasive plant species identification and treatment
    - Pesticide Applicator Certification, Registered Applicator, and Re-Certification SWPPP support training
    - Best practices MDTA sensitive areas maintenance

Conclusion

The Mitigation Division supported the installation and maintenance of mitigation plantings and related vegetation management MDTA-wide. The team delivered bi-annual inspections for construction contracts, in-cycle and out-of-cycle reporting, capital plan reviews, training sessions, and project tracking. With the increased projects due to ETL construction, the focus to improve on current workflows inefficiencies will streamline larger workloads.



Natural Resources Landscape Operations and Mitigation Accomplishments

FY2024

(01 JULY 2023 – 30 JUNE 2024)

Office of Engineering & Construction – Environmental Division

Natural Resource Lead:
Julie McCarthy, MDTA

Maryland Transportation Authority

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Executive Summary

The MDTA Office of Engineering and Construction (OEC) Natural Resources (NR) Mitigation Division (Division) manages assets related to construction projects, landscape operations, permitting compliance of all impacted natural resources, mitigation management and monitoring reporting for all projects, compliance tracking, as well as actively maintaining routine maintenance work orders (WO). The NR assets are tied to environmental permits used for either advanced credit to offset environmental impacts and/or in-kind mitigation based on such impacts involving varying regulatory environmental agencies that require monitoring, reporting, and compliance based on performance conditions set forth by the regulators.

Fiscal Year 2024 (FY24) Overview

The NR Division supported the installation and maintenance of mitigation plantings and related vegetation management MDTA-wide. This involved best practices for plant establishment and pesticide / vegetation management based on the MDOT Standard Specifications for Construction. Below is a summary of activities completed during FY24.

- Reviewed 25 capital project erosion and sediment control, landscape, reforestation, and stormwater design plans and provided comments.
- Installed plant materials for 12 contracts (50 site locations), followed by installation and establishment support. The following plant materials were installed:
    - Trees – 4,445
    - Shrubs – 3,022
    - Herbaceous materials – 27,873
    - Live Stakes – 10,642
- Monitored all Category 700 plant materials for 9 contracts across 11 site locations to meet post-construction compliance.
- Closed 15 contracts at 25 site locations.
- Treated approximately 1 acre of invasive species, with bulk at the White Marsh Run mitigation site.
- Treated approximately 0.89 acres of phragmites at the Lansdowne Mitigation (HT-3012) site.
- Created and provided Best Management Practice (BMP) Training for each maintenance facility (November 2023 – June 2024).
- Calibrated the Rapid Mitigation Dashboard to review and track monitoring results more efficiently.
- Collected invasive plant data throughout MDTA right-of-way (ROW) and initiated several Work Orders (WO) to treat select areas.
- Supported the Design Team and the Drainage Investigation Team with project closeouts or tree surveys to amend permits based on redline or field construction changes.

Projects

Rapid Mitigation Dashboard

The Rapid Mitigation Dashboard was created to tie together the data collected from the various NR Mitigation survey applications used to monitor wetlands, waterways, and reforestation projects and summarizes the data to provide an overall performance grade. Staff complete rapid assessments between benchmark years of formal agency monitoring to recognize and address issues that may compromise mitigation credits. Additionally, this information provides managers with advice about remedial maintenance activities, allowing for forecasting the budget.

MDNR/Baltimore City Roadside Trees

Division staff supported the I-95 Express Toll Lane (ETL) program by focusing on two projects spread across 33 sites: I-95 ETL northbound extension at Maryland Route 152 (MD 152) Interchange Reconstruction (KH-3019) and I-95 ETL extension from MD 43 to South of MD 152 (KH-3009), which were planted for reforestation and roadside tree mitigation in FY24. All other reforestation and roadside tree mitigation projects were monitored both during and after applicable warranty periods.

MDE Bay TMDL Restoration - Trees

In FY24, the Division installed one new TMDL tree planting site located at Days Cove (MR-3017-1003) and monitored two (2) MA-3004 sites (TMDL Enhancement of Pre-2000 stormwater management (SWM) BMPs at the WPL Police/Auto Maintenance Building).

Critical Area Commission (CAC) Mitigation

There are currently two bank sites (FSK CAC Bank and Bay Bridge CAC Bank) that are monitored and maintained annually (448 trees, 822 shrubs) out of the nine total banks that MDTA owns. Both bank sites are in year three out of five years of monitoring and the Division maintained both sites in FY24.

MDE/USACE Compensatory Mitigation

In FY24, the Division focused on increased monitoring and invasive treatment at all mitigation sites to ensure mitigation credits. Activities included:

- **FSK all-electronic tolling (AET; KB-2708)** – Division staff monitored tree and site conditions year-round, treated ~0.59 acres of *Phragmites* and replaced dead trees in FY24.
    - September 2023 – Inspection
    - April 2024 – Inspection
    - May 2024 - Replacements
- **Bay Bridge CAC Bank (BB-3017)** – Division staff monitored health and survivability of planted trees at the tree mitigation banks year-round in FY24.
    - April, May, June 2024 – Inspection
    - December 2023 - Replacements
    - April 2024 - Replacements

- **White Marsh Run (ETL100)** – Invasive Vegetation Management (IVM) was conducted around vernal pools and wetlands (< 1 Ac). See Figure 1 below.



Figure 1. Overview of treated wetlands and vernal pools

Major activities at the White Marsh site (see Figures 2 and 3 below):

- November 2023 – Invasive treatment
- May 2024 – Invasive treatment



Figure 2. Invasive treatments at the vernal pool complexes



Figure 3. Invasive treatments at created access path

- **MDTA ROW Phragmites Invasive treatment** – Division staff conducted phragmites inspections throughout entire MDTA right of way (ROW) and MDTA facilities. Treatment occurred in FY24 for facilities: Inter-County Connector (ICC), Baltimore Harbor Tunnel (BHT), Fort McHenry Tunnel (FMT), Chesapeake Bay Bridge (BB), Francis Scott Key Bridge (FSK).

- **Lansdowne stream mitigation of a Patapsco River Tributary (HT-3012; ETL200)** – Division staff provided rapid inspection monitoring throughout the year; invasive treatment occurred November 2023 and March 2024 for *Phragmites australis* (~ 0.89 Ac treated). Division staff captured drone footage and labeled with stationing and wetland areas. Finally, staff completed an Earth Day trash clean-up in April 2024 (see Figure 4).
    - July 2023 – Inspection

- December 2023 – Inspection
- March 2024 – Inspection
- April 2024 – Earth Day Trash Clean-Up (see Figure 4)



Figure 4. Staff from the 2024 Earth Day trash cleanup collected approximately 35 bags of trash.

- **Carsin's Run Tributary (ETL200; KH-3028)** – The Division conducted rapid inspection monitoring throughout the year, removed fallen/dead trees, and treated ~0.37 acres of invasive species: Japanese honeysuckle (*Lonicera japonica*), multiflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*), and privet (*Ligustrum* sp.). The Division captured drone footage and labeled with stationing and wetland areas in March 2024 (see Figure 5).

  In May 2024, MDE evaluated the wetlands and waterways against permit performance criteria and the viability of mitigation credit retention. MDE determined that one tributary, measuring 804 linear feet (LF), and most of the wetlands will be removed from future monitoring efforts and future credits. Other MDTA mitigation sites will cover most of these credits. The main tributary, Wetland 6, Wetland 7, and tree plantings will continue to be monitored for mitigation credit.
  - July 2023 – Rapid Inspection
  - December 2023 – Rapid Inspection
  - March 2024 – Drone flight & Rapid Inspection



Figure 5. Photo from drone flight conducted in March 2024.

Wildlife

As part of mitigation monitoring, wildlife field cameras were placed at various sites across MDTA projects. These cameras are relocated as needed to observe both human and animal activity (see Figure 6). In FY23, Division staff installed bat, bird, and owl boxes; these boxes are intermittently monitored for wildlife activity.



Figure 6. Deer captured on wildlife camera at White Marsh Run Mitigation Site

FY24 Asset Graphs

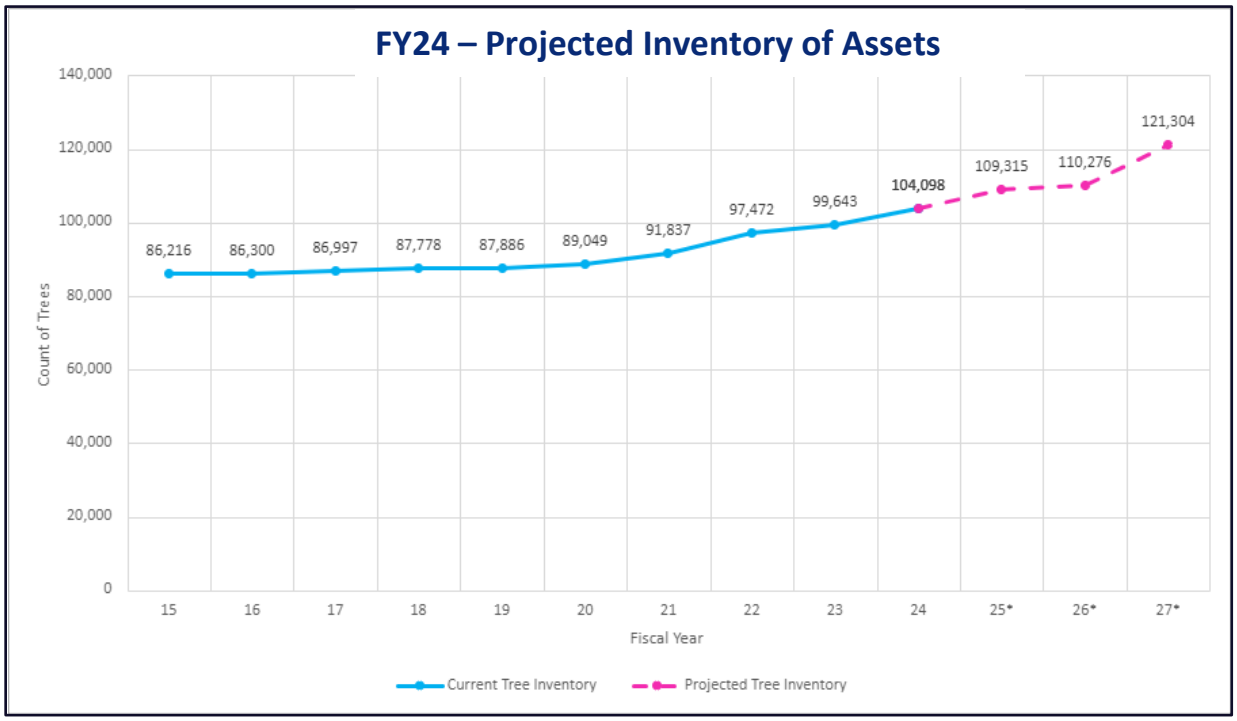


Figure 1. Total trees planted since 2015, and projected plantings until 2027 (Projected planting data is based on upcoming planting contracts).

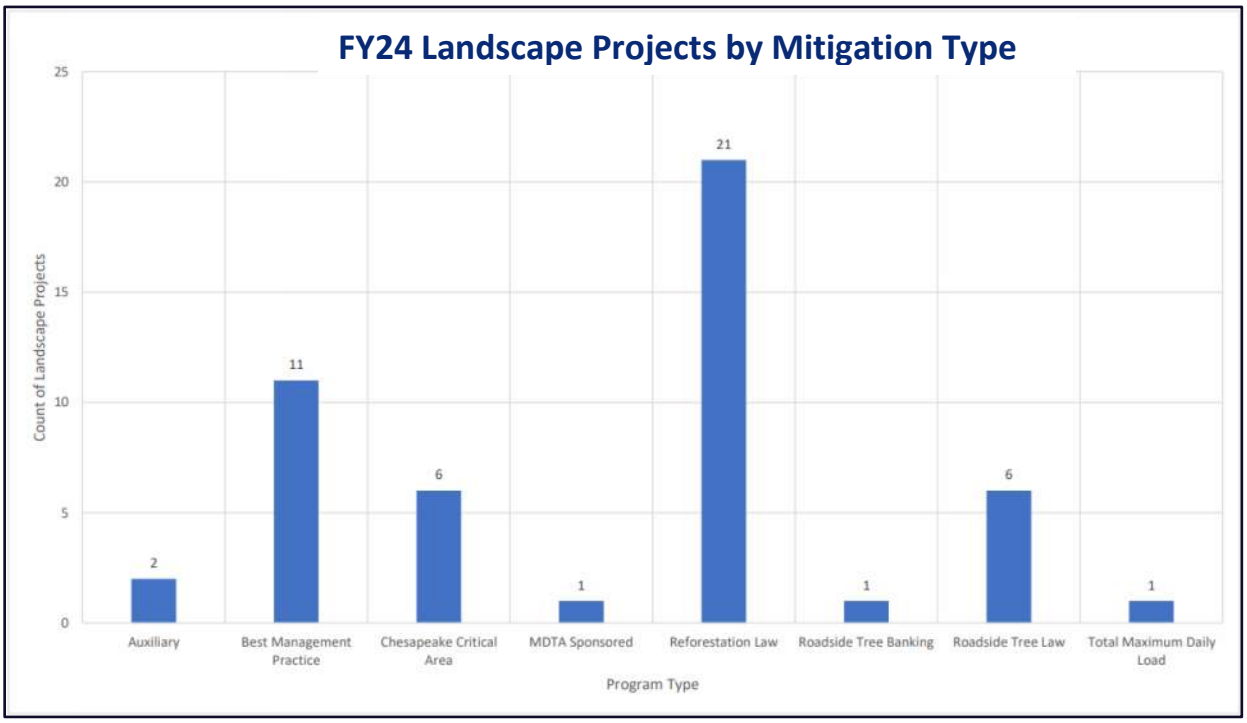


Figure 2. Total projects split up by mitigation type.

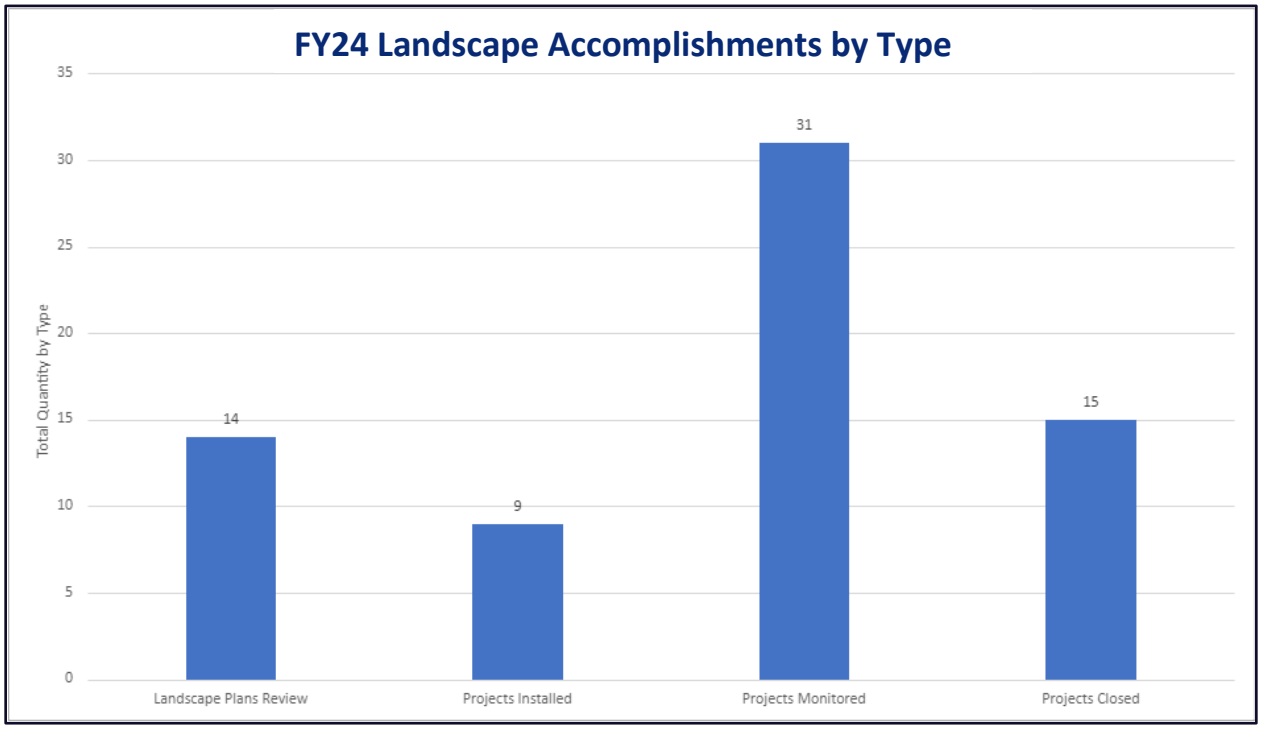


Figure 3. Total project accomplishments by type.

FY24 List of Installed Assets

Table 1. Landscape Installation List FY24

MDTA ID	Feature ID	Program Type	Project Description	Trees	Shrubs	Herbaceous	Live Stakes
BB-3017	Area A	Chesapeake Critical Area	Bay Bridge Critical Area Mitigation Plantings - Area A	36	54	0	0
BB-3017	Area B	Chesapeake Critical Area	Bay Bridge Critical Area Mitigation Plantings - Area B	6	0	0	0
FT-3019	PA-1	MDTA Sponsored	FMT Plaza Planters	0	0	8870	0
KH-3009	BR 2-11-1	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	0	1770	0
KH-3009	BR 2-1-6	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	45	1430	0
KH-3009	BR 2-3-1	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	52	2163	0
KH-3009	BR 2-4-1	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	43	1680	0
KH-3009	BR 2-4-2	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	44	2490	0
KH-3009	BR 2-4-3	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	28	1380	0
KH-3009	BR 2-5-2	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	17	4125	0
KH-3009	BR 2-6-3	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	47	985	0
KH-3009	BR 2-8-4	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	36	879	0
KH-3009	BR-1	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	24	480	0
KH-3009	Overflow for KH-3009	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152 - Reserved for Future MDTA Reforestation Needs	191	0	0	0
KH-3009	PA-10	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152	87	0	0	0
KH-3009	PA-11	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152	145	0	0	0

MDTA ID	Feature ID	Program Type	Project Description	Trees	Shrubs	Herbaceous	Live Stakes
KH-3009	PA-12	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152	144	0	0	0
KH-3009	PA-4	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152	100	0	0	0
KH-3009	PA-6	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152	62	0	0	0
KH-3009	PA-7	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152	103	0	0	0
KH-3009	PA-8	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152	102	0	0	0
KH-3009	PA-9	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152	94	0	0	0
KH-3009	RV-1	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152	13	0	0	0
KH-3009	RV-2	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152	30	0	0	0
KH-3009	SGW-1	Best Management Practice	I-95 ETL NB Extension From MD 43 to South of MD 152	0	0	340	0
KH-3009	WUS-18A	Reforestation Law	I-95 ETL NB Extension From MD 43 to South of MD 152 - Stream Restoration	493	580	0	9047
KH-3019	GL-2	Auxiliary	Old Joppa Rd Greenline 2 - Homeowner	57	0	0	0
KH-3019	GL-1	Auxiliary	Old Joppa Rd Greenline 1	80	34	0	0
KH-3019	Old Mount. Rd	Roadside Tree Law	Old Mountain Rd - Homeowner Screening	17	0	0	0
KH-3019	PA-4	Roadside Tree Law	Planting Area 4	47	0	0	0
KH-3019	PA-5	Roadside Tree Banking	Planting Area 5	21	0	0	0
KH-3019	RAB-1	Roadside Tree Law	Roundabout RAB-1	0	679	500	0
KH-3019	REF-1	Reforestation Law	Reforestation Area 1	54	0	0	0
KH-3019	REF-1 Relocation	Reforestation Law	I-95 ETL NB Ext - Overflow for Reforestation Area 1	54	0	0	0
KH-3019	REF-4	Reforestation Law	I-95 ETL	64	0	0	0
KH-3019	SC-2	Roadside Tree Law	Stream Channel - Part 2	37	0	0	563
KH-3019	SC-SB-LS_1	Reforestation Law	Stream Channel Southbound Live Stakes	0	0	0	1032

MDTA ID	Feature ID	Program Type	Project Description	Trees	Shrubs	Herbaceous	Live Stakes
KH-3030	PA-1	Reforestation Law	I-95 ETL NB Ext: SB I-95 Noise Wall - MD-24 Woodsdale	138	0	0	0
KH-3031	PA1	Roadside Tree Law	Noise wall Along SB I-95 South of Calvary Road	0	15	0	0
MR-3017-0016	PA2_RL3	Roadside Tree Law	24" Pipe Deterioration and Slope Erosion Remediation	37	0	0	0
MR-3017-1002	PA2	Chesapeake Critical Area	MDTA Police Headquarters Planting & Stabilization Phase 1	26	50	0	0
MR-3017-1003	DAYS_REF-1	Reforestation Law	Days Cove Reforestation Planting - Reforestation Area	298	0	0	0
MR-3017-1003	DAYS_TMDL-1	Total Maximum Daily Load	Days Cove Reforestation Planting - TMDL Area	232	0	0	0
MR-3017-1003	WBY_REF-2	Reforestation Law	Willoughby Beach Reforestation	1440	0	0	0
NB-0543	BOWLING	Reforestation Law	Bowling Property Stream Restoration	219	1123	0	0
NB-0543	PA-14	Reforestation Law	Planting Area 14 - Tree Preservation Zone	11	0	0	0
NB-3003	PA-02	Chesapeake Critical Area	Nice-Middleton Bridge Campus Improvement Project	5	151	781	0
NB-3003	PA-2A	Chesapeake Critical Area	Nice-Middleton Bridge Campus Improvement Project Part 2A	8	0	0	0
NB-3003	PA-2B	Chesapeake Critical Area	Nice-Middleton Bridge Campus Improvement Project Part 2B	4	0	0	0
Total				4,445	3,022	27,873	10,642

Other Accomplishments

Training and Outreach

In FY24, the NR Division provided the following training:

Training Topic	Staff Trained	Completed
BMP Training: landscape and vegetation management best practices for roadside and SWM BMP facilities.	All Maintenance Facilities	06/11/2024

GIS

Natural Resources Geodatabase

In FY24, Division staff updated the GIS database as construction projects occurred to ensure the tracking system included the most-up-to-date information. Division staff consolidated geodatabase fields and built relationships between layers to dynamically link all resources.

Inspections

Division staff adjusted Survey123 forms, report templates, and protocol documents for better alignment with workflows and scoring results. Staff improved the Landscape Construction Compliance inspection survey to minimize post-processing. Finally, staff developed new surveys for photologs, reports, and WO tracking.

Reporting

Due to a Microsoft update, Power Automate was disabled until MDTA upgrades to Enterprise 11. Once updated, email notifications for submitted inspections and future notifications will be re-created to support asset tracking in FY25.

Future Activities

Apart from continuous support for OEC's Projects, goals for the upcoming FY25 include:

1. Execute and manage work orders for the MR-3030 contract.
2. Monitor mitigation sites and CAC banks.
3. Provide training on the following topics: SWPPP Invasive Species Identifications & Treatment, Pesticide Certification and Re-Certification Training, and BMP/Landscape Maintenance Training
4. Build and maintain pollinator habitat pilot sites for future conversion of MDTA ROW into ecological uplifting habitat specifically for pollinator species.
5. Work with GIS consultants to finalize natural resources map tracking for real time updates of all landscape projects.

6. Improve the GIS invasive species data collection workflow, implement the NR Asset Tracking & Analysis website to centralize tracking and project information, and incorporate linked documents to the GIS assets for quicker viewing.
7. Implement future ArcGIS tools to assist with site selection, invasive species mapping, and corridor management.
8. Once MDTA upgrades to Enterprise 11, email notifications for submitted inspections and future notifications will be re-created to support asset tracking in FY25.

Conclusion

The NR Division supports MDTA project delivery and ensuring environmental compliance. On the project delivery side, the NR division provides design review support ensuring landscaping and erosion sediment control compliance, supports construction by providing landscape installation/establishment inspections for payment acceptances, and project closeout. Additionally, the team provides post construction monitoring of environmental assets for compliance tied to varying environmental permits or regulations. The NR Division develops construction and post construction surveys to ensure contract and environmental permitting compliance. Post construction monitoring on mitigation sites leads to adaptive management and now, remedial maintenance task orders are executed on a crew day contract based upon monitoring inspection results to continue to ensure environmental mitigation compliance.

The NR Division continued and will continue to provide programmatic support with various training needs from pesticide certification training to MDTA Operations and other trainings for outreach credits ensuring Municipal Separate Storm Sewer System (MS4) compliance and look to develop more innovative strategies in the future.

Appendix A.6 - BMP Maintenance Training and Roster

MDTA's Training Course in

MAINTENANCE BEST PRACTICES

For maintaining stormwater & landscape areas along the right-of-way.

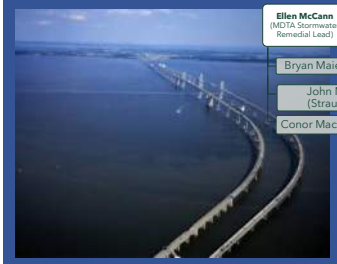
Maryland Transportation Authority
Taking you places!

William Preston Lane Jr. Memorial Bridge (LB or BB)
US 50/301 over the Chesapeake Bay Bridge



1

OEC Environmental Team



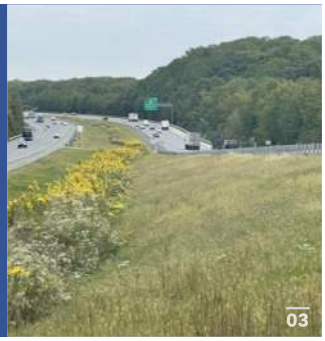
- **Ellen McCann** (MDTA Stormwater Remedial Lead)
  - Bryan Maietta (JMT)
  - John Martin (Straughan)
  - Conor Mackey (JMT)
- **Julie McCarthy** (MDTA Natural Resources Lead)
  - Mike Greenberg (Straughan)
  - Aaron Brown (WSP)
  - Chelsea Connor (JMT)
  - Shannon Pursell (Coastal)
  - Christi Noble Darcy (AECOM)
  - Jake Barben (Wallace)
  - Chad Hoekzema (WSP)
  - Christina Kundrat (RK&K)

2

2

Course Goals

1. To maintain compliance with training requirements for NPDES/MS4 permitting.
2. Reinforce and update operations on current best practices.
3. Implement MDTA's principal goal of promoting stewardship of green assets with effective operation & maintenance procedures.



03

3



course outline

01	02	03	04
Lesson	Lesson	Lesson	Lesson
Regulations & goals	Management zones	Stormwater management	Landscape management & sensitive environmental areas

4

lesson 01

Regulations & goals



5



Regulations

MD-DNR	MDE	USFWS	USACE
• Trees: RTP • Forests: FCA • Critical Area	• Wetlands • Waterways • Tidal Waters • Stormwater • Sediment Control	• Federally listed Wildlife of no commercial value	• Waters of the US

06

6

Management goals

Holistic Approach

Highway Safety

Environmental stewardship

Regulatory compliance

Operations & maintenance

07

7

Design & Future Maintenance

Construction changes to highways incorporate sustainable roadside design elements to minimize maintenance operations for ROW vegetation & stormwater facilities.

Considerations include:

- Reduced need for mowing
- Naturalized areas
- Simple maintenance
- Elimination of Buffer Strips

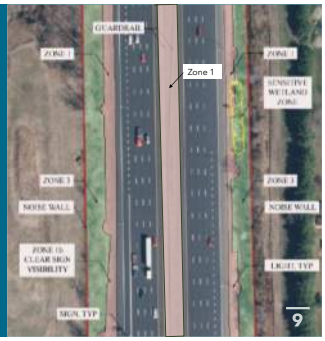


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lesson 02

Management zones



9

9

overview

Shifting to a new focus → Corridor management zones

Provides a consistent level of maintenance

Zone 1 - Highway Clear Zone

- Includes: Zone 1a - short meadow Zone 1b - tall meadow
- Located entirely within AASHTO clear zone; trees and shrubs not permitted.

Zone 2 - Structures

- Includes bridge abutments, lights, signs & stormwater structures
- To facilitate inspection & maintenance of structures.

Zone 3 - Forest

- Includes: a) Forest Edge b)Forest Interior
- Located outside of AASHTO clear zone; trees and large shrubs are permitted.

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Zone 1- Highway Clear Zone

You will be maintaining this zone most frequently!



Priority Table	
Zone 1a - SHORT MEADOW	Zone 1b - TALL MEADOW
Actively managed to maintain low vegetation height for optimum visibility for highway users.	Only mowed 1x during the dormant season (Oct-Mar).
Higher priority	Lower priority
10-ft from edge of pavement	30-ft from edge of travel lane

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Zone 2 - Structures

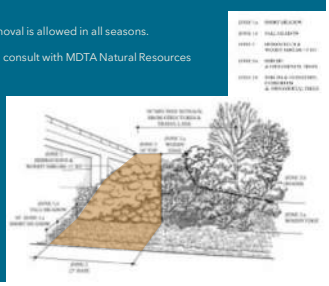
- Mowing, trimming, brush cutting, and trash removal is allowed in all seasons.
- Management might be site specific and should consult with MDTA Natural Resources

Examples

High aesthetic value requires more attention

Areas not visible require little management.

Sensitive environmental areas might be nearby and require consultation.



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Zone 2 – Structures

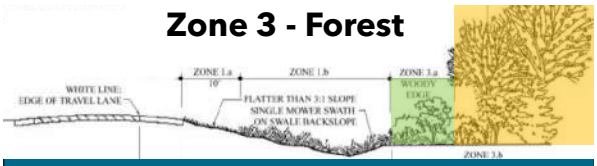
Scheduling Goals

Prioritize operations during months shown in color shading.



13

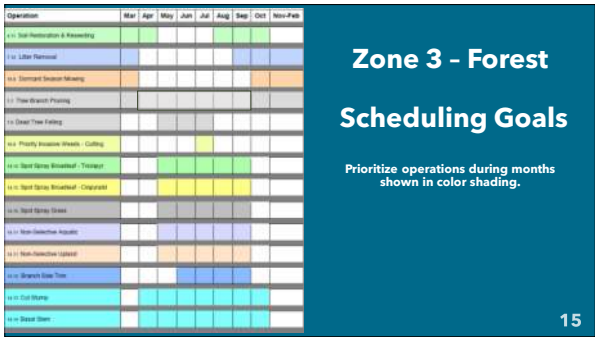
Zone 3 - Forest



Priority Table	
Zone 3a – FOREST EDGE	Zone 3b – FOREST INTERIOR
Ensure hazardous trees do not imperil highway users, utilities or structures.	As needed, ensure hazardous trees do not imperil highway users, utilities or structures.
Control invasive vines & brush	Control invasive trees, shrubs, and vines
Remove invasive trees, shrubs and vines, while preserving desirable ones.	Few management activates are routinely performed.

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Zone 3 – Forest

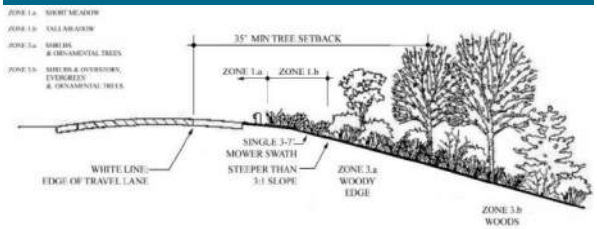
Scheduling Goals

Prioritize operations during months shown in color shading.

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15

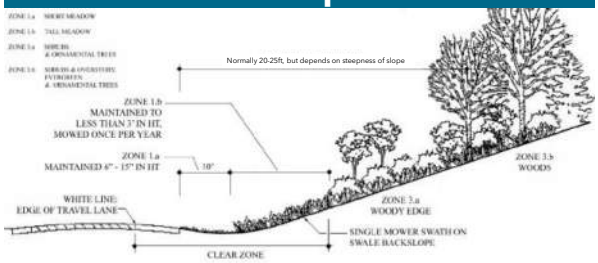
fill slopes with barrier



16

16

cut slopes

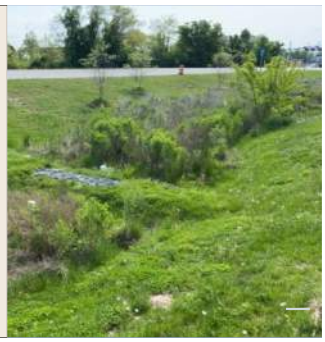


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17

lesson 03

Stormwater management



18

18



Introduction

The Maryland Transportation Authority (MDTA) owns and maintains multiple storm water management BMPs throughout Maryland.

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Importance of Maintenance

- Compliance with NPDES/MS4 Permit
- Water quality and quantity benefit
- Prolong life of the BMP
- Aesthetics
- Safety

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20

Types of BMPs

Large Scale Ponds / Basins

- Wet and dry ponds
- Infiltration basins



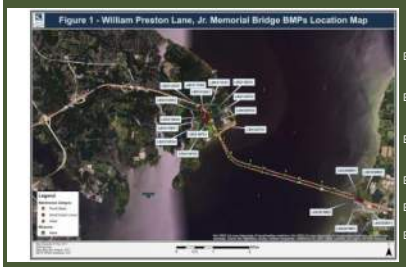
Small Scale Linear Practices

- Bioswales/ grass swales
- Micro-bioretention
- Rain gardens
- Submerged Gravel Wetlands



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Maintenance Manual



2023 Update

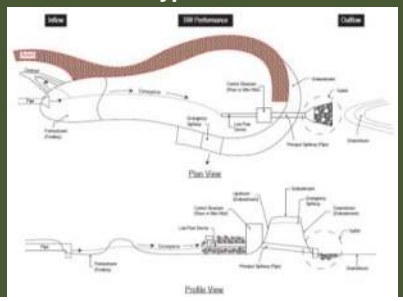
- ☑ Front section describes types and typical maintenance activities
- ☑ Overview map/ tabulated inventory
- ☑ Typical work order forms – large scale vs small scale BMPs
- ☑ Pond and linear BMP schematics
- ☑ Bioswale schematic
- ☑ Individual BMP mapping

(Updated BMP Overview map to be provided in O&M Manual)

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22

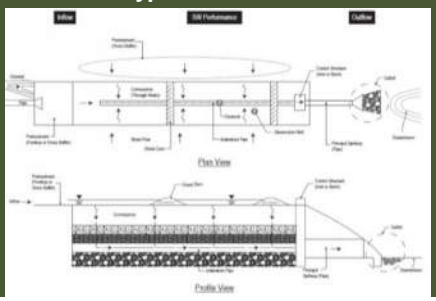
Schematic of Typical Pond/ Basin BMP



23

23

Schematic of Typical Small Scale/ Linear BMP



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24

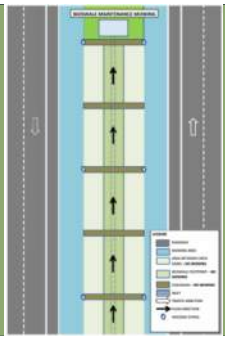
Maintenance Activity Schedule for Ponds/ Basins

Action	Frequency	Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Inspection	1X per year or more	Check pipe or ditch inflow, riser structure, spray upkeeps, ponding depth, slope stability, and other conditions			X									
Routine Inspection	4X during Spring/ Summer	Monitor within BMP - vegetative growth, invasive vegetation, sedimentation in forebay and basin, slope stability, erosion				X		X		X		X		
Mowing	6X per year	Mow side slopes and embankment; trim excessive turf growth in basin				X		X		X		X		
Trash and Debris Removal	1X per year or more	Remove / dispose of accumulated trash and debris within and around site	1x per year or more											
Vegetation Management	1X per year or more	Remove volunteered woody vegetation, especially along embankment	1x per year or more											
Invasive Vegetation Control	1X per year or more	Manage invasive species. As needed repair impoundment surface if disturbed	1x per year or more											
Sediment Removal	As needed, at least every 5 years	Remove / dispose of accumulated sediment within forebay and/or impoundment	As needed, at least every 5 years											
Inflow Stabilization	As needed	Stabilize discharge locations (outfalls, weirs, etc.)	As needed											
Site Stabilization	As needed	Stabilize site area	As needed											
Impoundment Maintenance	As needed	Repair eroded / exposed areas. Monitor for excessive ponding	As needed											
Control Structure Maintenance	As needed	Repair defects to control structure (e.g., cracks, clogged low-flow pipes / openings, pipe separations)	As needed											
Landscaping	As needed	Replace / supplement landscaping	As needed											

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25

Schematic of Bioswale Maintenance Mowing



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26



Maintenance Work Order Form for Ponds/ Basins

27

27

Do's and Don'ts for Maintenance

- ✓Mowing
- ✓Vegetation management
- ✓Minor repairs
- ✓Stabilization



Grate at BB Police HQ properly maintained and functioning

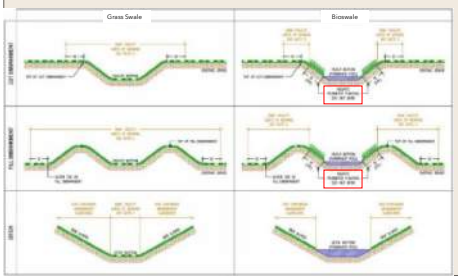


BMP grate at different facility entirely blocked with invasives and trash

28

28

Do's and Don'ts for Maintenance



Sensitive areas within Zone 1 need careful attention when mowing.

Minimize management impacts.

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Current Process

Annual inspections (rating system)

Simplified work order form (emailed annually)

Tracking via ArcGIS Online

Maximo

30

30

lesson

04

Landscape Management and Sensitive environmental areas



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31

Sensitive environmental areas

Sensitive environmental areas may include legally protected areas of:

- Freshwater wetlands
- Tidal wetlands
- Chesapeake Bay Critical Areas
- Streams
- Stormwater management facilities
- Floodplains

Note: When in doubt about the exact location of sensitive areas, it is best to assume its present and to select less invasive management options or ask the MDTA Natural Resources Manager



BB CAC Bank at EZ Pass

*LB/BB is within Critical Area and requires prior authorization for some maintenance activities

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Chesapeake Bay Critical Area (CBCA)

Critical Area = 1,000-ft

Critical Area Buffer* = 100-ft

*has more stringent requirements.

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Critical Areas within BB/LB Facility



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Maintenance Activities within Critical Area

(in and out of the 100' CA buffer is the same)

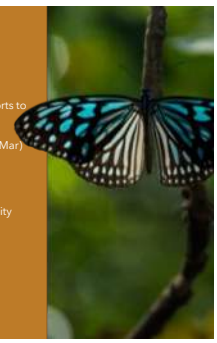
Authorized	Requires Authorization
✓Mowing existing turf grass	× Tree, shrub, brush removal
✓Vine removal	× Routine meadow mowing
✓Maintenance for access to SWM riser structures or inflow / outflow pipes	× Ground disturbance/soil exposure
✓Trim bioswales & bioretention areas 1-2x / year to **6" depth**	× Adding pavement, gravel, rock
✓One time fall meadow mow at **7" depth**	

35

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Best Practices

1. Preservation of tall meadow in Zone 1b is a major focus of MDTA efforts to promote native plants and pollinators in roadside areas.
2. Only mow tall meadow 1x per year during the dormant season (Oct-Mar)
3. Respect the planting areas installed for compliance plantings.
   - Only mow around the planting areas and not between the trees
4. Herbicide application may occasionally be necessary to control priority invasives.



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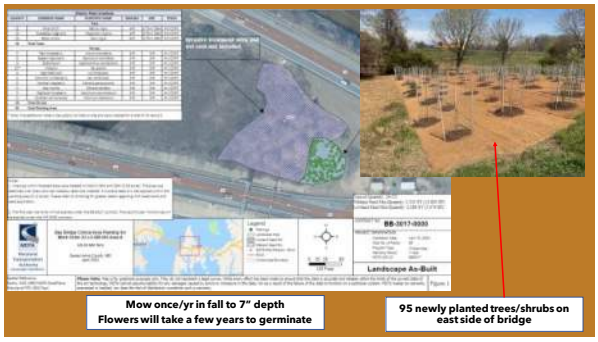
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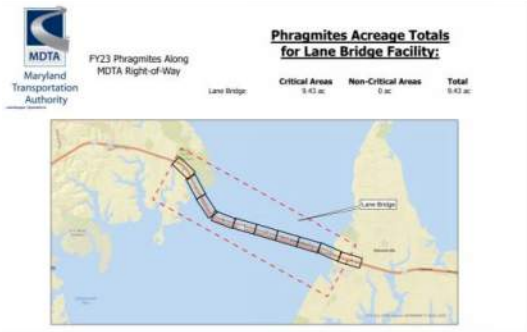
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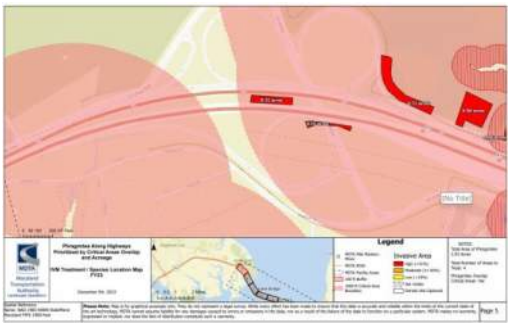


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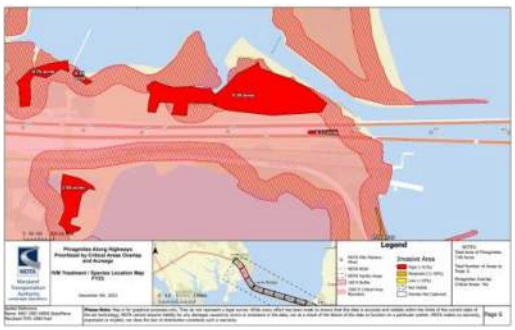
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Who Can Treat Invasive Species?

Registered Vs. Certified



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Invasive Management Calendar

Treatment Options	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Foliar												
Basal Bark - eastern Spring lines effective												
Cut Stump Treat												

Species	Chemical	Mechanical											
Common Reed (*Phragmites australis*)	Imazapyr (Early summer), Foliar Aquatic Glyphosate (Late summer)	Weed eater	M				C						M
Japanese Knotweed (*Reynoutria japonica*)	Foliar Glyphosate w/surfactant or Triclopyr	Hand tools or power tools	M				C/M						M
Callery Pear (*Pyrus calleryana*)	Basal Triclopyr or Cut stump	Chainsaw, Silvo	C/M										
Bamboo Cane Cane (*Phyllostachys spp. Bambusa spp. Arundinaria gigantea*)	Glyphosate, Imazapyr or Triclopyr, cut stem	Hand tools, reed blade weed eater	M				C/M						M
Autumn Olive (*Elaeagnus umbellata*)	Cut stump or basal w/ Glyphosate or Triclopyr	Brush mower, chainsaw	C/M (optimal)				C/M						C/M (optimal)
Mile-a-minute (*Persicaria perfoliata*)	Foliar Glyphosate w/surfactant or Triclopyr (DO NOT SPRAY)	Hand pull - mow						C/M (optimal)	C/M				
Japanese Honeysuckle (*Lonicera japonica*)	Glyphosate foliar or Triclopyr cut stem	Brush hog, Silvo, Cut "window"*	C/M					Foliar (optimal)					C/M
Multiflora Rose (*Rosa multiflora*)	Glyphosate foliar or Triclopyr cut stem	Brush hog, Silvo	C/M					Foliar (optimal)					C/M
Tree of Heaven (*Ailanthus altissima*)	Basal or cut stump Triclopyr	Pull only if <1.5" dsh,	C/M						Basal (optimal)	C/M			
Oriental Bittersweet (*Celastrus orbiculatus*)	Cut stem or basal Triclopyr	Brush hog, Cut "window"*	C/M										
Canada Thistle (*Cirsium arvense*)	Foliar Aminopyralid/Clopyralid	Mow			M			C/M					
Kudzu (*Pueraria montana var. lobata*)	Cut-stem, root crown Glyphosate or Triclopyr	Brush hog, mow, machete						C/M					
Porcelain berry (*Ampelopsis brevipedunculata*)	Cut stem or basal Triclopyr	Cut "window"*	C/M										

C = Chemical, M = Mechanical

*Cut vine at ground level and as high as you can reach. Portions that stay rooted will remain alive and must later be treated or cut repeatedly. May or may not be required.

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Tools for Field ID



Seek by iNaturalist App

iNaturalist App

Google Lens App
(allows search by image)

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Do's and Don'ts

Goal:



Thriving upland meadow.

Avoid:



Highly manicured turf grass

50

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Key Take Aways

Topics	Summary
Regulations & goals	• Natural Resources are highly regulated • Incorporate sustainable roadside design elements to minimize maintenance
Management zones	• New approach to management using corridor zones • Zone 1 – Highway clear zone is the most managed zone
Stormwater management	• BMPs improve water quality required for NPDES/MS4 permit • Maintenance manual updated in 2023 includes typical activities with improved schematics
Sensitive environmental areas	• Sensitive areas including streams, wetlands and stormwater facilities are protected. • LB/BB is mostly in the Chesapeake Bay Critical Area, which requires approval for most maintenance activities.
Landscape management & invasives	• Naturalized areas are encouraged to improve pollinator habitat (i.e., less mowing) • Invasive species should be managed to protect desired vegetation

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Improvements Moving Forward

- More training sessions?
- Onsite meetings?
- More GIS usage?
- Where would you like to access these documents?

52

52

contact info

Stormwater

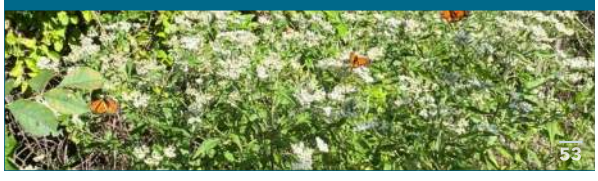
Ellen McCann
443-589-2400
EMcCann2@mdta.state.md.us

Bryan Maietta
410-316-2282
BMaietta@jmt.com

Natural Resources

Julie McCarthy
410-537-7861
jmccarthy@mdta.state.md.us

Mike Greenberg
443-652-2321
mgreenberg@straughanenvironmental.com



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TRAINING SIGN IN ROSTER

TYPE		COURSE NUMBER:	BMP training	TRAINING LOCATION	WPL Maintenance BLDG
COURSE TITLE:	Bay Bridge BMP/ Landscaping Maintenance Training	HOURS	1	INSTRUCTOR(S) (Print)	Christi Darcy

COMMENTS:

DATE	EIN #	NAME (Printed)	EMPLOYEE SIGNATURE	RC #	DIVISION (OPS, ENG, POL, FIN, HR, etc)	FACILITY/DEPT
6-11-24	290135	EAN Brown	Ean Brown	9041	Operations	WPL
6-11-24	261-086	HAROLD Coleman	Harold Coleman	9041	Operations	WPL
6/11/24	363143	Kyle Simpson	Kyle Simpson	9041	Operations	WPL
6/11/24	281928	Alan Plutschak		9041	Operations	WPL
6-11-24	402903	Christian Fernandez	Christian Fernandez	9041	Operations	WPL
6-11-24		Christi Darcy	AECOM/MDTA	9041	Operations	WPL
6-11-24		Bryan Maietta		9041	Operations	WPL OEC
6-11-24		Conor Mackey		9041	Operations	WPL OEC
6-11-24		Ellen McCann		9041	Operations	WPL
6-11-24	240659	DAVID CARUNCHO		9041	Operations	WPL
6/11/24	327657	Rich Ford		9041	Operations	WPL
6/11/24	338400	Brian Lowery		9041	Operations	WPL
6/11/2024	256216	Russell CORNISH		9041	Operations	WPL
6/11/24	~~~	Ben Schmitt	Ben Schmitt	9041	Operations	WPL
				9041	Operations	WPL
				9041	Operations	WPL

Supervisor/Instructor _____ (Sign) – *Printed name at top of form*

ENTERED INTO LMS BY: _____ Coordinator (Date)

Appendix B: MCM No. 2 - Public or Personnel Involvement and Participation Supporting Documentation

Appendix B.1 - MDOT Annual Attainment Report

Goal **Ensure Environmental Protection and Sensitivity**

Deliver sustainable transportation infrastructure improvements that protect and reduce impacts to Maryland's natural, historic, and cultural resources



OBJECTIVES:

- Protect and enhance the natural, historic, and cultural environment through avoidance, minimization, and mitigation of adverse impacts related to transportation infrastructure, including support for broader efforts to improve the health of the Chesapeake Bay
- Employ resource protection and conservation practices in project development, construction, operations, and maintenance of transportation assets
- Implement initiatives to reduce fossil fuel consumption, mitigate Greenhouse Gas (GHG), and improve air quality

MDOT continues to streamline its business processes, minimizing any adverse impacts on the environment while conserving natural resources, and integrating sustainability into various aspects of the transportation systems at the policy, program, and project levels of implementation. MDOT has a well-rounded approach to environmental stewardship spanning a range of natural resources including air, land, and water. MDOT's actions encompass climate change mitigation by reducing GHG emissions, increasing climate adaptation and resiliency, and conservation of resources for more sustainable operations and service delivery. MDOT's Transportation Business Units (TBUs) continue to reduce the effects of transportation and the built-environment by way of effective planning, creative and interdisciplinary approaches to project delivery, and collaboration.

MDOT's commitment to environmental initiatives has been demonstrated in the form of policies, programs, initiatives, and project-level actions. An example of this is the conversion to more energy efficient vehicles. MDOT MPA's Dray Truck Replacement Program has replaced 275 older dray trucks with newer, cleaner-running engines that reduce emissions. The Diesel Equipment Upgrade Program has replaced or retrofitted diesel cargo-handling equipment such as forklifts, top loaders, locomotives, and tugs with cleaner engines. Other MDOT TBUs are replacing light duty fleet vehicles with electric vehicle (EV) models in response to legislation passed in 2021 and 2022. MDOT MTA, also in response to legislation mandates passed in 2021 and 2022, is planning facility upgrades and installation of charging infrastructure in preparation for introducing zero emission buses (ZEBs) into the MDOT MTA transit bus fleet. MDOT MAA is planning to replace parking lot shuttle buses at BWI Marshall Airport with electric models.

Maryland continues to be a leader in zero emission vehicles (ZEV) and ZEV infrastructure. In 2022, Maryland was ranked as the 6th best state by the American Council for Energy-Efficient Economy for its policy and program efforts supporting electrification deployment. Maryland also was among the first states in the nation to submit their National Electric Vehicle Infrastructure (NEVI) Plan to the Joint Office of the U.S. Department of Transportation (U.S. DOT) and the U.S. Department of Energy ahead of the August 1, 2022, deadline. The NEVI plan, as required by the 2021 U.S. Infrastructure Investment and Jobs Act (IIJA), and federally approved in September 2022, describes how $57 million in federal funds will be allocated to EV charging infrastructure in Maryland. This plan is vital to support the growing number of EVs in Maryland and in the country. As of June 30, 2022, there are more than 52,300 registered EVs in Maryland—a 50% increase from the previous year. Currently, there are more than 1,200 charging stations with more than 3,300 outlets, of which 20% are DC Fast chargers (DCFCs), in Maryland.

Maryland is dedicated to protecting and enhancing its natural resources. In 2021, MDOT established the Urban Tree Program, providing grant funding to replace trees in communities where transportation construction projects impacted tree cover. MDTA initiated and completed the Chesapeake Bay Crossing Study Tier 1 National Environmental Policy Act (NEPA), and the Federal Highway Administration (FHWA) approved the Bay Crossing Study Tier 1 combined Final Environmental Impact Statement and Record of Decision (FEIS/ROD) that identifies Corridor 7—the corridor containing the existing Bay Bridge—as the Selected Corridor Alternative. MDOT also is committed to preserving cultural resources by identifying important historic site locations along our transportation system. MDOT supports the preservation and study of significant historic sites along scenic byways including Harriet Tubman's Birthplace in Dorchester County. Recent discoveries on the Tubman family are incorporated into public interpretive signage and exhibits located along the Harriet Tubman Underground Railroad Byway.

MDOT ENVIRONMENTAL INITIATIVES

MDOT MAA: Working collaboratively with the Maryland Department of Natural Resources (MDNR), MDOT MAA finalized a Forest Conservation Easement (FCE) encompassing more than 122 acres, which includes 84 acres of wetlands of special state concern (WSSC). The FCE benefits rare, threatened, and endangered (RTE) species located within the easement and MDOT MAA by serving as forest mitigation to support ongoing development at BWI Marshall Airport. Also at BWI Marshall Airport, the Kitten Branch Stream Restoration is a compensatory mitigation project that was constructed in 2014, which MDOT MAA continues ongoing monitoring and adaptive management. Project objectives of channel stability, vigorous vegetative establishment, and low invasive species coverage continue to improve. In FY 2022, a Phase 3 Adaptive Management Repair Project was completed to enhance geomorphic stability. MDOT MAA also is implementing lighting improvements at four facilities at Martin State Airport. These improvements, funded with a 71% Baltimore Gas & Electric (BGE) grant, are estimated to reduce annual energy use in those facilities by 63% and save more than $5,600 per year in operating expense.

MDOT TSO: In response to IIJA, MDOT prepared the Maryland State Plan for NEVI Formula Funding Deployment, describing how $57 million in federal funds will be allocated to EV charging infrastructure in Maryland. This plan has become more necessary as between July 2021 and July 2022, EV ownership in Maryland increased by more than 46% from 30,080 to 52,966 registrations. In 2021, MDOT established the Urban Tree Program, providing grant funding to replace trees in communities where transportation construction projects impacted tree cover. MDOT TSO received several awards in 2022, including a Maryland Quality Initiative (MdQI) Innovation Award for its $3.1 million Smart Ponds project, which installed monitoring and adaptive control features at stormwater ponds in Aberdeen, Hagerstown, and Fruitland to increase retention time and water quality and the Electronic Product Environmental Assessment Tool (EPEAT) Purchaser Award in four product categories, highlighting the commitment to sustainable electronics purchasing. MDOT is the only state DOT in the world to be recognized for this.

MDOT MTA: MDOT MTA is planning facility upgrades and installation of charging infrastructure, in preparation for introducing ZEBs into the MDOT MTA transit bus fleet. To support the growing demand for EV charging infrastructure, Maryland is working to deploy a robust EV supply equipment (EVSE) infrastructure of more than 1,200 charging stations and 3,300 charging outlets. Of these, 24 EV charging stations are available at Light Rail, Metro, bus, and MARC train stations, providing an EV-to-transit connection by allowing EV drivers to charge their vehicles at the transit station while completing their trips using transit.

MDTA: MDTA initiated and completed the Chesapeake Bay Crossing Study Tier 1 NEPA, and the FHWA approved the Bay Crossing Study Tier 1 combined FEIS/ROD that identifies Corridor 7—the corridor containing the existing Bay Bridge—as the Selected Corridor Alternative. MDTA also won an environmental award for Carsins Run Stream Restoration. MDTA also opened the 924/24 Park and Ride with bus shelters accommodating Harford Transit Blue Line service and sidewalks installed to create pedestrian access connection to MDOT MTA 410 bus transit line.

MDOT MPA: In 2022, MDOT MPA and the U.S. Army Corps of Engineers signed a Project Partnership Agreement (PPA) for the $4 billion Mid-Chesapeake Bay ecosystem restoration project to rebuild the James and Barren islands using dredged materials. MDOT MPA also convened the Mid Bay Resiliency Working Group, a collaborative effort across state and federal resource agencies and stakeholders to maximize the coastal resiliency benefits of the project. The Barren Island restoration will create 72 acres of wetlands habitat, protect and preserve sub-aquatic vegetation, and improve water quality.

MDOT MVA: In December 2021, MDOT MVA completed its information technology (IT) modernization project known as Customer Connect, which enhanced the customer's experience by providing greater access to information, security, and the ability to conduct more online transactions than ever before. Customer Connect provides customers and employees with a complete view of the customer's status and history with the MDOT MVA by linking their driver and vehicle accounts. MDOT MVA also is becoming a "one-stop-shop" by partnering with other Maryland agencies, including MDNR, MDTA, Department of Veteran Affairs, and most recently the Maryland Department of Health to issue birth certificates of Maryland-born customers at select MDOT MVA branch offices to assist with the federal REAL ID document requirements. These innovations and collaborations increase efficiencies and reduce required trips for customers.

MDOT SHA: MDOT SHA is identifying opportunities in operations and maintenance to meet specific GHG emissions reductions and direct emissions targets at MDOT SHA facilities. MDOT SHA also will coordinate with partners and stakeholders to review legislation establishing GHG performance measures and, if enacted, coordinate with partners and stakeholders to establish performance targets. MDOT SHA also funded a Freight AV Feasibility Study for FY 2023 to identify civil projects for AV freight vehicles, which will support the reduction in fuel consumption by heavy vehicles.

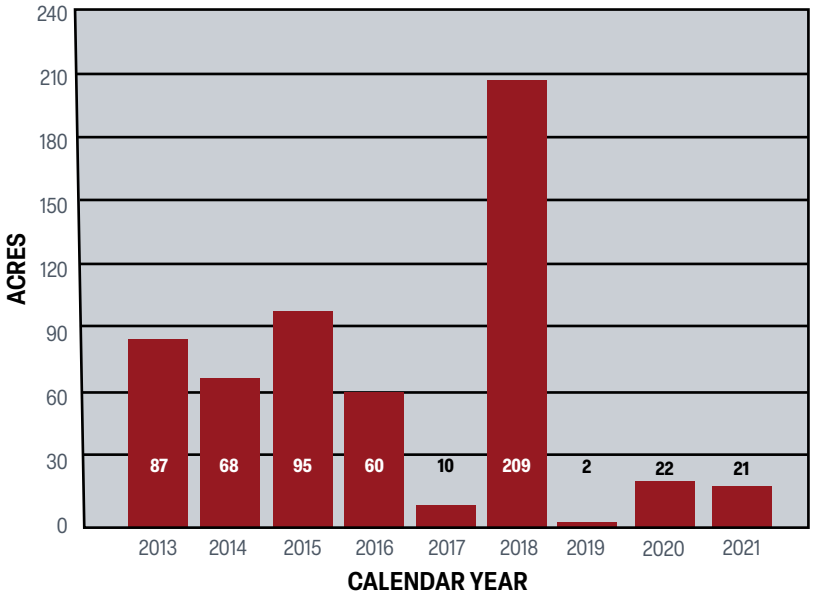


OBJECTIVE: Protect and enhance the natural, historic, and cultural environment through avoidance, minimization, and mitigation of adverse impacts related to transportation infrastructure, including support for broader efforts to improve the health of the Chesapeake Bay

ACRES OF WETLANDS OR WILDLIFE HABITAT CREATED, RESTORED, OR IMPROVED* **



MDOT agencies are in compliance with the various permits that are granted to construct projects needed to improve the transportation system on land and offshore.



Acres created, restored, or improved depend on the amount of mitigation obligated by project permits in a given year, as well as the construction completion date for the mitigation projects. Data is a sum of acres of wetlands or wildlife habitat created, restored, or improved by MDTA, MDOT MPA, or MDOT SHA.

***Due to newly available data, data have been revised from previous reports.*

WHY DID PERFORMANCE CHANGE?

- The amount of wetland and/or wildlife habitat acres created, restored, or improved annually by Office of Environmental Design (OED) mitigation projects is dependent on the amount of mitigation obligated by project permits in a given year; several OED mitigation projects are under development currently and will continue to deliver required mitigation during the next several years

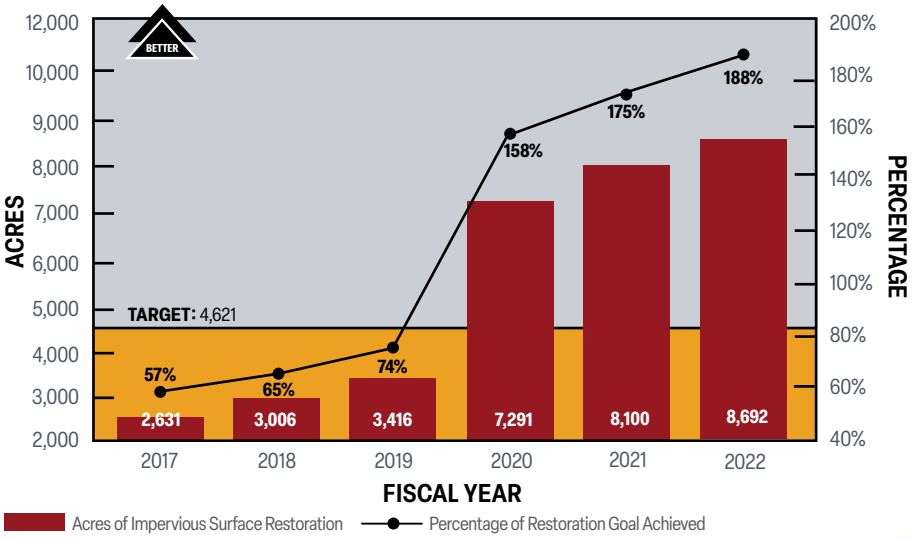
WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- MDOT MPA looks to create wetlands and/or wildlife habitat through its Dredged Material Management Program (DMMP); Poplar Island was recently expanded to be a dredged material facility through the early 2030s, which will create an estimated 700+ acres of wetland and wildlife habitat; when Poplar Island is no longer able to accept dredged material, the Mid-Chesapeake Bay Island Restoration Project will restore more than 2,000 acres of wildlife and wetland over its lifetime
- MDOT SHA will continue to identify environmental impacts during project development and meet mitigation requirements as obligated in the project permits
- MDTA will be using existing Nice/Middleton bridge materials for artificial reef habitat creation on the lower Potomac River

WATER QUALITY TREATMENT TO PROTECT AND RESTORE THE CHESAPEAKE BAY* **



This measure tracks MDOT compliance with achieving impervious surface restoration as required by the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit.



TARGET: 4,621 acres by October 2022

Data is reported cumulatively.

**Restoration best management practices (BMPs) have changed, resulting in additional credits for previous years, causing past data to change to reflect the updated BMPs.*

WHY DID PERFORMANCE CHANGE?

- MDOT SHA continued implementation of stormwater management and water quality improvement projects and achieved 188% of the permit goal (20%) by treating its impervious surfaces not previously treated by stormwater management controls; approximately 8,692 impervious acres were treated by MDOT SHA through October 2021 to reduce pollution entering local waterways and ultimately the Chesapeake Bay

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- MDOT SHA's permit has been administratively continued and is in the planning phase preparing for the issuance of the next permit

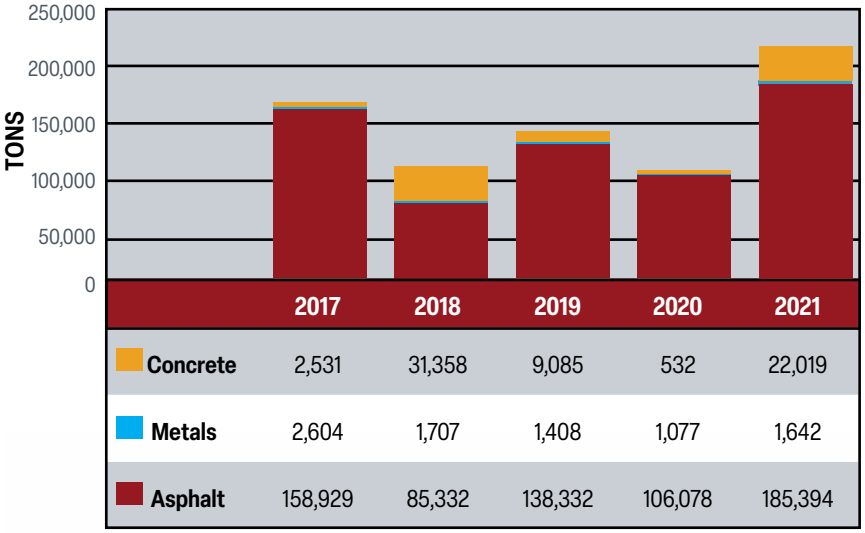


OBJECTIVE: Employ resource protection and conservation practices in project development, construction, operations, and maintenance of transportation assets

RECYCLED/REUSED MATERIALS FROM MAINTENANCE ACTIVITIES AND CONSTRUCTION/DEMOLITION PROJECTS*



For years, MDOT has been working to minimize waste, reuse materials, and reduce GHG emissions through energy efficiencies and alternative energy sources. This measure tracks this progress for asphalt, metals, and concrete from maintenance activities and construction/demolition projects. These combined efforts will save money and make Maryland communities more livable for decades to come.



	2017	2018	2019	2020	2021
Concrete	2,531	31,358	9,085	532	22,019
Metals	2,604	1,707	1,408	1,077	1,642
Asphalt	158,929	85,332	138,332	106,078	185,394

CALENDAR YEAR

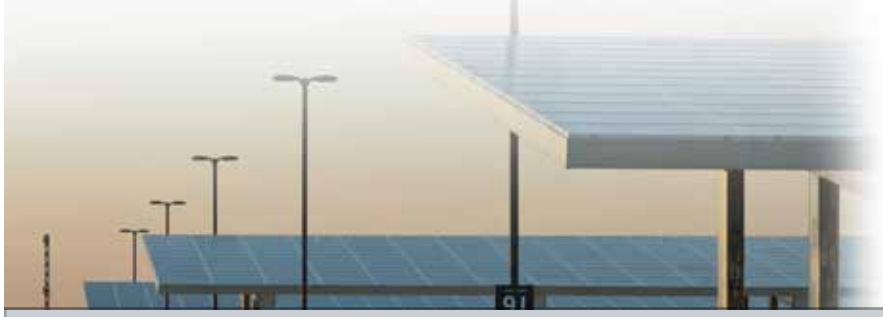
Recently, more data sources have become available that have increased the historic recycled metals figures.

WHY DID PERFORMANCE CHANGE?

- The use of recycled asphalt pavement (RAP) materials in Hot Mix Asphalt (HMA) in CY 2021 was 22.5%, which is consistent with usage in previous years (20%-22%); the variations in the tonnages per year reflect the changes in the yearly tonnage of asphalt mix place; so far in CY 2022, the average RAP used in state paving projects are 29% and this could go down to around 25% as we use more specialty mixes for interstate paving
- Contractors can choose recycled concrete-graded aggregate base (RC-GAB) instead of conventional GAB material, provided the material specifications are met
- The tonnage of RC-GAB used in CY 2018 (10,180 tons) was greater than the average for the period 2012-2018 (8,997 tons); RC-GAB usage increased in 2019 to 12,490 tons and subsequently decreased during the COVID-19 pandemic
- During the COVID-19 pandemic, MDOT SHA increased its number of mill and pave asphalt projects so there was not enough scope to use RC-GAB as much as expected when completing full-depth pavement rehabilitation projects; as more full-depth pavement rehabilitation projects are done, it is expected that RC-GAB usage will increase if more than one Qualified Plant produces RC-GAB

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- MDOT SHA is trying to implement balanced mix design technologies on an experimental basis in asphalt paving projects starting from CY 2023, this could increase the usage of recycled materials in asphalt paving projects without compromising the pavement performance



UTILITY ELECTRICITY USE AND RENEWABLE ENERGY GENERATION



MDOT is committed to reducing electricity consumption through efficiency measures and renewable energy sources to help Maryland reach its clean energy and GHG reduction goals. Reducing energy consumption and generating renewable energy can save Maryland taxpayers money, generate revenue, and decrease harmful air emissions. MDOT measures both the consumption of utility energy and the amount of renewable energy generated by MDOT.

MEGAWATT HOURS IN THOUSANDS (FY)	2017	2018	2019	2020	2021
Electricity Use	364	379	367	338	343
Renewable Energy Generation	1.629	1.431	1.275	1.127	1.155

WHY DID PERFORMANCE CHANGE?

- Electricity use has decreased overall over time due to energy efficiency measures implemented across MDOT
- The COVID-19 pandemic caused many MDOT staff members to work from home, reducing MDOT's in-office electricity consumption; this number rose slightly in 2021 as more staff went back to working in the office, but still follows an overall decrease since pre-pandemic
- Many buildings across the state did see an increase in natural gas consumption as COVID-related HVAC policies required more outdoor/"fresh" air to be used; now that MDOT staff have returned to state-owned buildings, usage is more consistent with previous years of decreased electricity use

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- Maintenance projects are planned for several photovoltaic (PV) systems, which will increase renewable energy generation statistics in the future

OBJECTIVE: Implement initiatives to reduce fossil fuel consumption, mitigate greenhouse gases, and improve air quality

TRANSPORTATION-RELATED EMISSIONS BY REGION

ON TARGET

Emission reduction strategies foster transportation alternatives to single occupancy vehicle travel, including bicycle and pedestrian projects, transit improvements, and other travel demand management (TDM) strategies, such as telecommuting, alternative work schedules, and carpooling. These transportation alternatives are promoted through MDOT's Commuter Choice Maryland program. Providing reliable, safe transportation alternatives helps to reduce fuel consumption, improve air quality, and improve public health.



PERFORMANCE MEASURE	REGION	CALENDAR YEAR 2011	2014	2017	2020
▼ Volatile Organic Compound (VOC) Tons per Day	Baltimore	45.5	41.3	25.9	18.9
	Washington*	39.2	35.4	23.9	16.8
	Other	20.7	21.1	13.4	8.8
◆ Nitrogen Oxide (NOx) Tons per Day	Baltimore	89.5	79.5	53.7	33.4
	Washington*	74.4	63.3	45.3	27.7
	Other	44.4	44.2	32.8	20.1
● Carbon Monoxide (CO) Tons per Day	Baltimore	445.1	431.8	365	283.8
	Washington*	363.6	352.6	335.5	257.1
	Other	202.4	229.1	180.1	145.3
■ Particulate Matter (PM2.5) Tons per Day	Baltimore	3.5	3.4	2.2	1.3
	Washington*	2.9	2.7	1.9	1.1
	Other	1.4	1.5	1.1	0.6

**Maryland portion of Washington region includes Montgomery, Prince George's, Frederick, and Charles counties.*

WHY DID PERFORMANCE CHANGE?

- The number of EVs registered in Maryland continues to grow and in 2022 topped 1% of vehicles on the road, exceeding 52,000 EVs in June
- Through the Congestion Mitigation and Air Quality (CMAQ) program, MDOT invested more than $1 million on three new projects in federal FY 2021, and more than $45 million on continuing projects; CMAQ funding supported traffic signal systemization, ride sharing, transit improvements, transit bus replacements, and Metro rail-car upgrades
- Maryland's Port of Baltimore has been successful at securing grants for emissions reduction projects, including from the U.S. Environmental Protection Agency's (EPA) Diesel Emissions Reduction Act (DERA) Program, allowing the conversion of Dray Trucks to cleaner engines
- In the Washington region, the Purple Line Capital Crescent Trail is funded for construction; MDOT continues to invest in bicycle and pedestrian projects with grant awards through the Transportation Alternatives and Kim Lamphier Bikeways Network programs

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

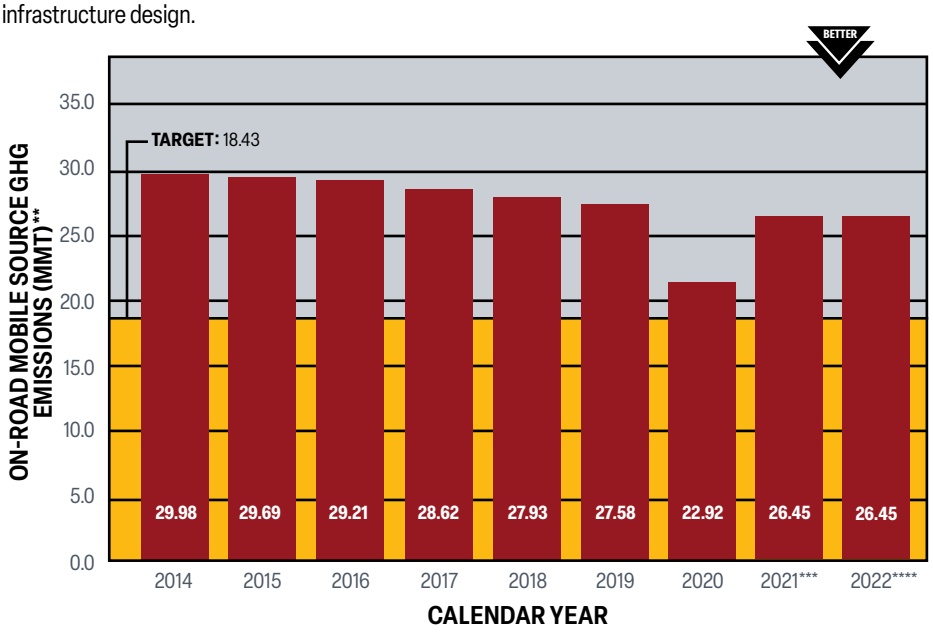
- Investments in projects that benefit air quality by MDOT MTA, MDOT MAA, and MDOT MPA are planned or underway, including programs to convert vehicles and equipment to electric models



TRANSPORTATION RELATED GREENHOUSE GAS (GHG) EMISSIONS

MAKING PROGRESS

The transportation sector accounts for 40% of Maryland's GHG emissions, with most emissions coming from on-road gasoline and diesel vehicles. MDOT's work to lower GHG emissions includes boosting travel choice, improving travel efficiencies, adoption of clean vehicle and fuel technologies, and improved infrastructure design.



TARGET: 40% below 2006 emissions by 2030, or 18.43 mmt CO2e in 2030*

**MDOT Greenhouse Gas Reduction Act (GGRA) Plan, Appendix J of Maryland 2030 GGRA Plan.*

***MMT CO2e stands for million metric tons of carbon dioxide equivalents, the standard unit of measurement for GHG emissions. Emissions are calculated using the most recent data and version of EPAs MOVES model available at time of analysis. MOVES2014a is used for analysis year 2016, 2017, 2018, and 2019. Highway Performance Monitoring System (HPMS) Vehicle Miles Traveled (VMT).*

****2021 revised from previous report to reflect Final 2021 HPMS.*

*****2022 estimate based on Sept 2022 annual VMT estimate, forecast to Dec 2022.*

WHY DID PERFORMANCE CHANGE?

- The pandemic affected changes in travel behavior as people and industries adapted to disruptions; telework continued a steady trend upward as more employers adopted telework arrangements; freight activity also has increased as more people rely on e-commerce
- MDOT's Commuter Choice Program launched the incenTrip mobile app and continued to promote alternative commute options to employers and commuters through a variety of outreach activities
- Efficiency of the on-road vehicle fleet continued to improve as older vehicles were replaced with newer vehicles that meet more stringent emission standards
- EVs were a growing share of the on-road fleet and in 2022 topped 1% of vehicles on the road
- MDOT maintains more than 100 Park-and-Ride lots across the state, which enable drivers to access buses, rideshare, and other forms of transit; MDOT SHA's Ride Share program offers an online interactive map to users who wish to access the location, space availability, Americans With Disabilities Act (ADA) features, and amenities of each Park-and-Ride lot

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

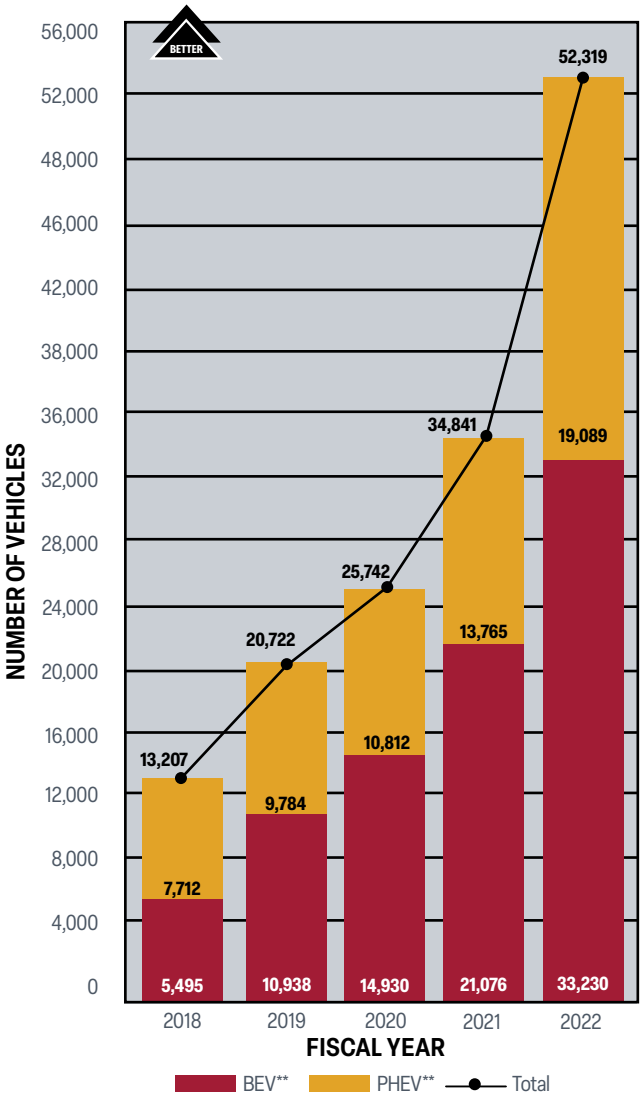
- To meet a 40% reduction in GHG emissions by 2030, a reduction of 18.43 million metric tons of CO2 equivalent is needed; MDOT is taking a multi-pronged approach to achieve this goal
- Implementation of congestion mitigation measures to improve travel and freight reliability reduces GHG emissions; this includes all initiatives under the Transportation System Management and Operations (TSMO) umbrella
- Another strategy is the adoption of vehicle and fuel technologies that reduce consumption of fossil fuels, including Intelligent Transportation System (ITS), Connected and Automated Vehicles (CAVs), and EVs
- Continued investment in infrastructure for non-motorized forms of transportation is vital, including bicycle and pedestrian options



TOTAL ELECTRIC VEHICLES (EVS) REGISTERED IN MARYLAND AND TOTAL PUBLICLY AVAILABLE EVS CHARGING INFRASTRUCTURE*

MAKING PROGRESS

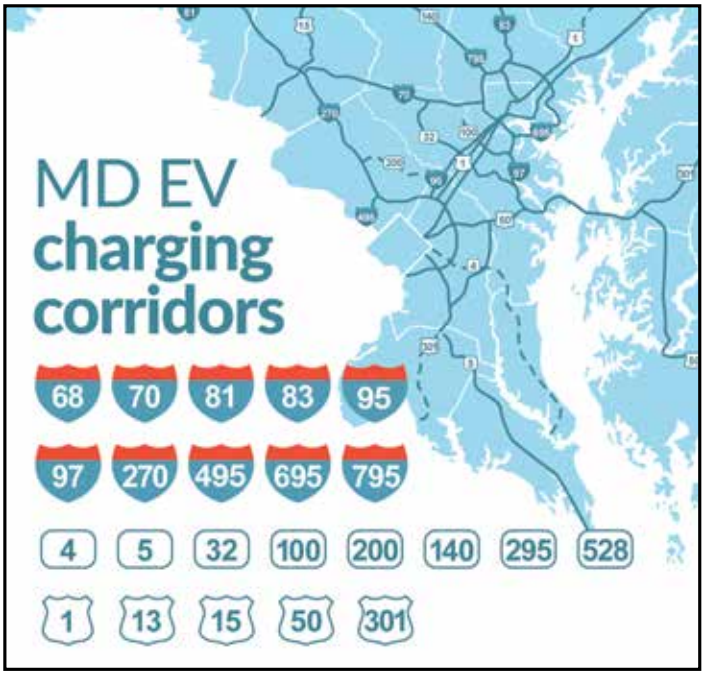
Encouraging the adoption of EVs among Maryland residents requires communication of the benefits of EVs, education about the charging options available, and publicity about charging station locations. MDOT has an important role to play with other public agencies and the private sector to build-out the charging infrastructure strategically in a manner that allows for easy charging along corridors people commonly traverse. State and federal agencies, along with utility companies, provide financial incentives for EVs through tax benefits and rebates. As of June 2022, there were more than 52,000 registered EVs in Maryland—a 50% increase from the previous October. These vehicles are supported by a growing network of charging stations. In Maryland, there are more than 1,200 charging stations with more than 3,300 outlets, of which 20% are DCFCs.



TARGET: 300,000 by 2030

**2018, 2019, and 2020 data are through June 30 of their respective years. Previous reports indicated the data was through July 31.*

***BEV = Battery Electric Vehicles; PHEV = Plug-In Hybrid Electric Vehicles.*



WHY DID PERFORMANCE CHANGE?

- Maryland now has 23 electric vehicle alternative fuel corridors (EV-AFCs), with the newest corridor, the Intercounty Connector/MD 200, nominated in May 2022; EV drivers can find publicly accessible EV charging stations in close proximity of EV-AFCs
- In FY 2021 and FY 2022 combined, MDOT TBUs purchased 55 Hybrid EVs (HEVs), nine Plug-in Hybrid EVs (PHEVs), and one Battery Electric Vehicle (BEV); these purchases were among the 130 EVs purchased for the state fleet in FY 2021 and FY 2022
- The number of publicly accessible EV charging stations in Maryland grew to 1,241 stations and 3,373 outlets by the end of June 2022, in response to growing demand and more EVs on the road
- Through a pilot program authorized by the Public Service Commission, Maryland's public utilities are installing EV charging stations at sites across the state; as a result of this pilot program, EV charging stations are now located at BWI Marshall Airport, at the Bay Bridge *E-ZPass*® Office, at certain MDOT MVA facilities, at the North Linthicum Light Rail station, and at several MDOT SHA facilities and Park-and-Ride lots
- Public interest in EVs continues to grow, affected by the cost of gasoline, automaker commitments to bring more EV models to market, heightened interest in climate change, and new federal commitments to electrification

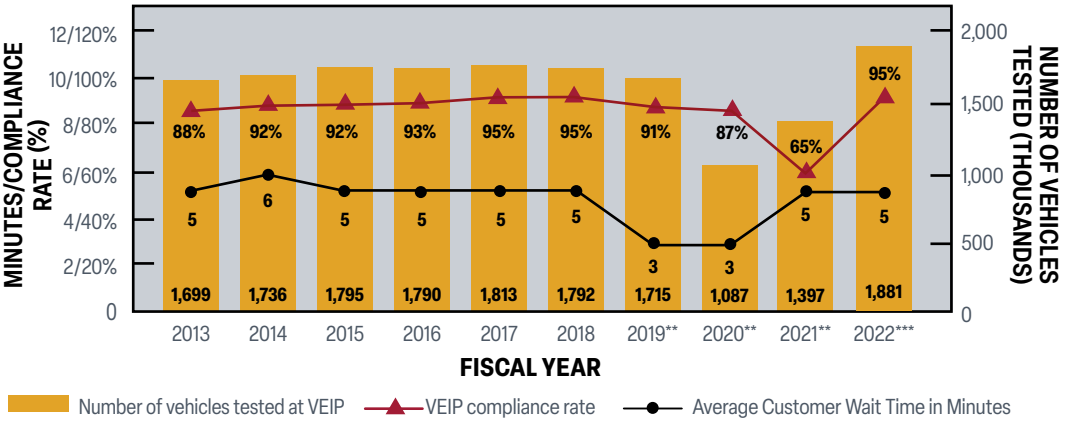
WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- In response to the NEVI Program established by the Bipartisan Infrastructure Law (BIL), MDOT prepared the NEVI Plan describing how $57 million in federal funds will be allocated to EV charging infrastructure in Maryland during the next five years
- The focus of NEVI Formula Funding in the short-term will be on building out and certifying Maryland's 23 EV-AFCs; long-term focus will be building out community charging in rural and disadvantaged communities
- In addition to NEVI Formula funds, discretionary NEVI funds are expected to become available in late 2022
- MDOT continues to lead the Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC), which provides a public forum for discussion and information-sharing from interested parties and stakeholders engaged in expansion of ZEV infrastructure in Maryland as well as conversion of state fleets

COMPLIANCE RATE AND NUMBER OF VEHICLES TESTED FOR VEHICLE EMISSIONS INSPECTION PROGRAM (VEIP) VERSUS CUSTOMER WAIT TIME*

MAKING PROGRESS

Monitoring the VEIP testing compliance rate ensures system effectiveness and identifies vehicles exceeding allowable standards. Tracking the average wait time at VEIP stations ensures that the 15-minute average wait time requirement is met. Timely and efficient customer service helps the state meet federal clean air standards by identifying polluting vehicles and encouraging regular vehicle maintenance.



14 counties offer VEIP tests: Anne Arundel, Baltimore, Baltimore City, Carroll, Harford, Howard, Queen Anne's, Cecil, Washington, Calvert, Charles, Frederick, Montgomery, and Prince George's.

***2019, 2020, 2021 data have been revised from previous report.*

***2022 data are preliminary and subject to change.*

WHY DID PERFORMANCE CHANGE?

- All MDOT MVA VEIP stations were fully operational during FY 2022; as a result, testing volumes increased from previous years as customers not testing during 2021 and 2022 because of COVID-19 returned to the testing pool
- As testing volumes increased statewide, compliance rates and wait times normalized to pre COVID-19 levels due to all MDOT MVA VEIP stations being fully operational, appropriate staffing levels to support operations, and a higher percentage of customers using the 24-hour self-serve VEIP kiosk
- MDOT MVA modernized IT systems to allow for both the agency and customers to have more rapid and reliable access to VEIP testing information and better communication regarding testing and compliance requirements

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- Continue to modernize VEIP to improve customer service benefits and preserve air quality progress achieved by the state; MDOT MVA and the Maryland Department of the Environment (MDE) continue to monitor the ongoing advancements with an emphasis in technology and innovation in vehicle manufacturing and vehicle emissions testing industries
- Issue new VEIP contract to further improve VEIP performance and customer convenience



GOAL PROMOTE ENVIRONMENTAL STEWARDSHIP: MINIMIZE AND MITIGATE THE ENVIRONMENTAL EFFECTS OF TRANSPORTATION

Key Outcomes: The four objectives and 11 performance measures outlined here will promote environmental stewardship. By utilizing environmentally-focused strategies and setting sustainability goals, MDOT will protect Maryland's natural, historic and cultural resources and minimize the impacts of fossil fuel consumption and other environmentally harmful practices.

MDOT has a well-rounded approach to environmental stewardship spanning a range of natural resources including air, land and water. MDOT's actions encompass climate change mitigation by reducing greenhouse gas (GHG) emissions, as well as climate change adaptation through resiliency efforts. MDOT promotes the conservation of resources for more sustainable operations and service delivery, as well as methods to protect and enhance Maryland's abundant and valuable natural resources.

With the passage of the Climate Solutions Now Act (CSNA) in 2022, Maryland has committed to a nation-leading interim goal of a 60% reduction below 2006 carbon emissions by 2031, progressing to a requirement to reach net-zero emissions by 2045. MDOT's modal administrations have already been working towards this goal. SHA is replacing light duty fleet vehicles with electric vehicle (EV) models and MTA is planning facility upgrades and installation of charging infrastructure in preparation for introducing zero emission buses (ZEBs) into the transit bus fleet. MAA and MPA are electrifying many of their vehicles used at airports and seaports to promote this objective as well.

Performance Measures

OBJECTIVES	PERFORMANCE MEASURE	RATING
Protect and enhance the natural environment through avoidance, minimization, and mitigation of adverse impacts related to transportation infrastructure	Percent of MDOT's Five-year Municipal Separate Storm Sewer System (MS4) Permits Attained	N/A*
Employ resource protection and conservation practices in project development, construction, operations and maintenance of transportation assets	Diversion Rate and Weight of Municipal Solid Waste; Demolition, Construction and Maintenance (DC&M) Waste; and Hazardous Waste	N/A*
	Annual Dredged Material Capacity Remaining for Harbor and Poplar Island Material (Million Cubic Yards)	 MAKING PROGRESS
	Increase the Beneficial Use and Innovative Reuse of Dredged Materials	 FACING CHALLENGES
Minimize fossil fuel consumption, reduce greenhouse gas emissions, and improve air quality and support the growth of alternative fuels	Vehicle Miles Traveled (VMT)/VMT Per Capita	 FACING CHALLENGES
	Number of Employee Partners in Statewide Transportation Demand Management (TDM) Programs	 FACING CHALLENGES
	Greenhouse Gas (GHG) Emissions From LDV VMT (Light-Duty) Vehicles and MHDV VMT (Medium-Heavy-Duty) Vehicles Statewide TDM Programs	N/A*
	Statewide Vehicle Emissions Inspection Program (VEIP) Testing Compliance Rate	 MAKING PROGRESS
Support the widespread adoption of alternative fuels electric vehicles, and innovative technologies	Percentage of MDOT Fleet Composed of Electric Vehicles (EVs)	N/A*
	Percent of Electric Vehicles (EVs) Registered From Total Registered Vehicles	 MAKING PROGRESS
	Level 2 and DC Fast Charging Ports Per 1000 Residents	N/A*

Target under development

In September 2023, MDOT won an $11.5 million award through the federal discretionary Consolidated Rail Infrastructure and Safety Improvement (CRISI) Program to acquire three new battery electric locomotive and one battery charger at the Port of Baltimore. With the adoption of the Advanced Clean Cars II rule in 2023, Maryland is expected to reach more than 1 million registered EVs by 2030. This accelerated growth in EV adoption is critical to meeting Maryland's goals of a 60% reduction in GHG emissions from 2006 levels by 2031 and net-zero carbon emissions by 2045.

Objective: Protect and enhance the natural environment through avoidance, minimization and mitigation of adverse impacts related to transportation infrastructure

PERCENT OF MDOT 5-YEAR MS4 PERMITS ATTAINED

In 2015, SHA received a National Pollutant Discharge Elimination System (NPDES) MS4 permit (No. 11-DP-3313) from the Maryland Department of the Environment (MDE) to control storm-drain-system pollutant discharges in MS4-designated areas. The permit requires that we use restoration practices to treat 20% of existing SHA impervious surfaces and address stormwater wasteload allocations (WLAs) established under U.S. Environmental Protection Agency (EPA)-approved Total Maximum Daily Loads (TMDL).

	FISCAL YEAR								
AGENCY	2015	2016	2017	2018	2019	2020	2021	2022	2023
SHA	34.6%	47.6%	53.7%	60.1%	67.2	100%	100%	100%	100%
MTA							100%	100%	100%
MDTA				100%	100%	100%	100%	100%	100%
MVA								100%	100%
MAA								100%	100%
MPA								100%	100%

TARGET: Target being developed for next year's report

**This performance measure is new to the AR.*

***100% compliance means that MDOT has treated the MDE-required area of previously built impervious surfaces. Treatment of impervious surfaces means that stormwater runoff impacts from an acre of impervious surface (e.g., pavement) are indistinguishable from an acre of natural systems (e.g., stormwater runoff from an acre of forest).*

What Is the Trend?

- The percent of MDOT five-year MS4 permits attained has reached 100%** for all modal administrations as of FY 2021.
- The smart pond credits were all finally certified in May of 2021 and the SHA Phase I permit requirements had to be met by October 8, 2020.
- MDOT continues to submit annual reports, but since the new Phase I permit hasn't been issued and the Phase II permit just expired, their requirements haven't changed since 2021, so they all remain at 100% attainment.

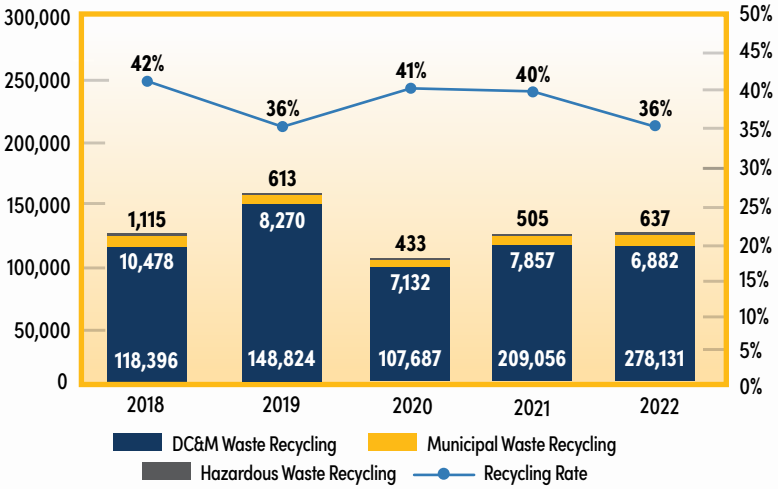
What Are Future Strategies?

- The new Phase I permit has not been issued and the Phase 2 permit likely will not be released for several years. (Even though the Phase II permit expired Oct 30, 2023, permit holders have until 2025 to implement all their projects.)
- Once the new permits are issued, MDOT will track percentage complete (performance) trends.

Objective: Employ resource protection and conservation practices in project development, construction, operations and maintenance of transportation assets

DIVERSION RATE AND WEIGHT OF MUNICIPAL SOLID WASTE; DEMOLITION, CONSTRUCTION AND MAINTENANCE (DC&M) WASTE; AND HAZARDOUS WASTE*

For years, MDOT has been working to minimize waste, reuse materials and reduce GHG emissions through energy efficiencies and alternative energy sources. This measure tracks this progress for asphalt, metals and concrete from maintenance activities and construction/ demolition projects.



TARGET: Target being developed for next year's report

**This performance measure is new to the AR.*

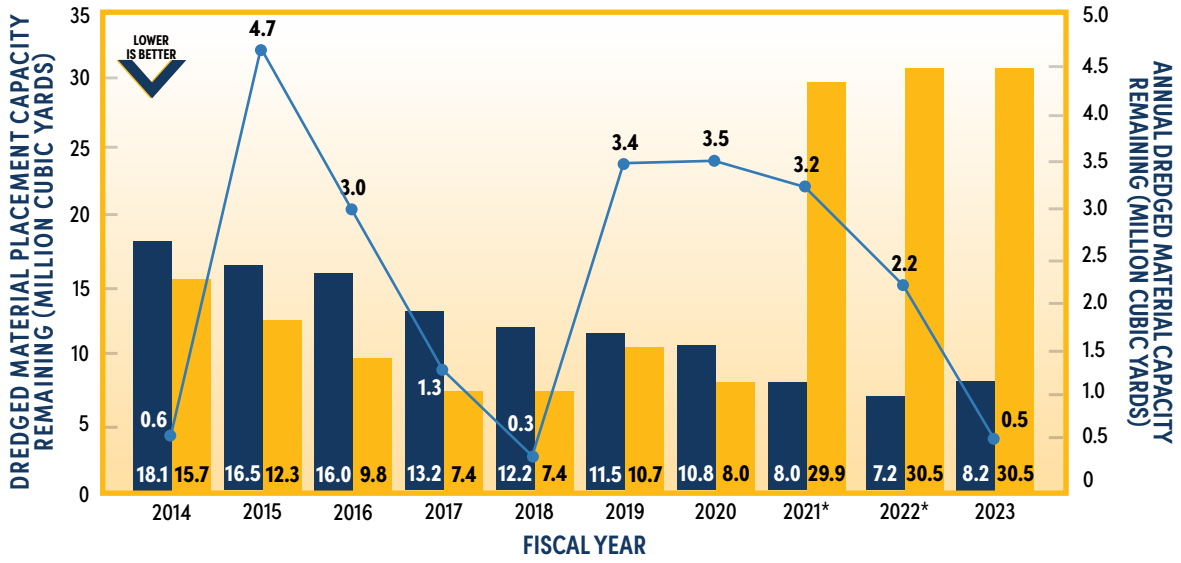
What Is the Trend?

- COVID-19 caused a decrease in overall waste production and recycling. However, MDOT's waste production and recycling is now returning to normal.
- DC&M waste recycling has steadily increased over the five-year period of calendar years 2018 to 2022, demonstrating MDOT's commitment to constant improvement.

What Are Future Strategies?

- MDOT has proposed development of a comprehensive MDOT Waste Reduction and Action Plan, pending approval and funding.
- MDOT is piloting a waste profiling and composting program at TSO to reduce compostable materials being wasted via standard trash pickup.

ANNUAL DREDGED MATERIAL CAPACITY REMAINING FOR HARBOR AND POPLAR ISLAND MATERIAL (MILLION CUBIC YARDS)



Harbor - Annual Dredged Material Capacity Remaining

Poplar Island - Annual Dredged Material Capacity Remaining

Annual Dredging to Keep Channels Clear, With Placement into MPA Managed Sites (Millions)

TARGET: 20-Year Capacity

**2021 and 2022 data have been revised from previous report.*

What Is the Trend?

- Maryland's Port of Baltimore continued to refine harbor dredged material placement capacity and dredging needs due to a reassessment of previous assumptions and current survey and engineering data. On average, there are 1.3 million cubic yards (mcy)/year of maintenance and state/federal new work dredging projects in the Harbor to make improvements to the channel system.
- The state's Dredged Material Management Program (DMMP) continues to support the U.S. Army Corps' Federal DMMP, which was updated and approved in FY 2018.
- Safety and mobility efforts to ensure unimpeded shipping access to the Port have been effective; the Port of Baltimore compares extremely well with the other fully functioning U.S. East Coast ports with 50-foot-deep channels.

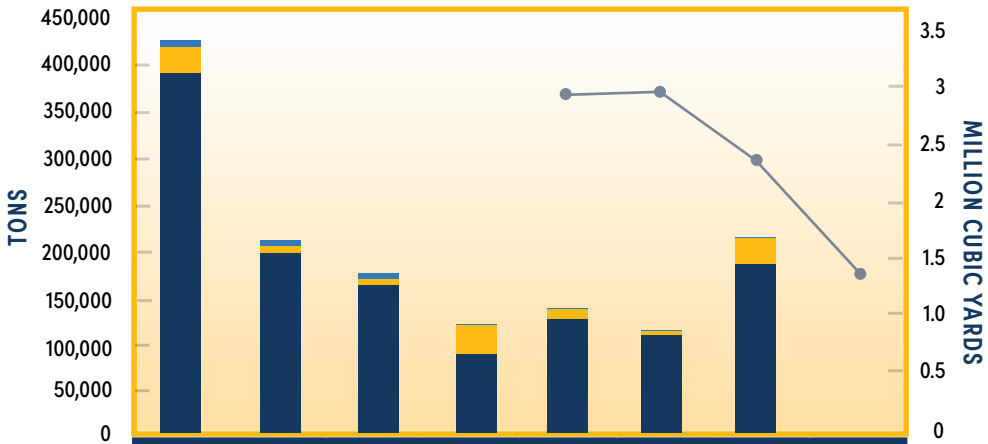
What Are Future Strategies?

- MPA, with the U.S. Army Corps, initiated the Seagirt Loop Feasibility Study in October 2020 to assess the need for navigational improvements to the Seagirt Loop Channel system. The effort was completed in June 2023, and the plan recommends the channel be deepened to 50-feet and widened. These changes will improve navigation efficiencies at the Port of Baltimore to help meet demand for future capacity at the Port facilities, including efficient handling of increased container volume at Seagirt Marine Terminal and faster and safer movement of vessels transiting the channels.
- Construction of the base dike widening, necessary for the Stage One expansion of the Cox Creek Dredged Material Containment Facility, was completed in FY 2021. Construction of the +60-dike raising began late summer 2021 and is expected to be completed in early 2024. Completion of this phase of expansion activities will add 9.8 mcy of harbor dredged material capacity.



INCREASE THE BENEFICIAL USE AND INNOVATIVE REUSE OF DREDGED MATERIALS*

Dredged materials, while often viewed as a waste product, also can be recognized as a valuable resource. MPA is a national leader in advancing the innovative reuse of dredged material through implementation of demonstration-scale projects and research studies and has also successfully shown how dredged sediments can be beneficially used to restore aquatic ecosystems and rebuild lost island habitat. MPA's long-term goal is to implement sustainable innovative reuse and beneficial use programs and projects to address capacity recovery and implement management solutions within Maryland's DMMP, thus supporting the long-term success of the Port of Baltimore.



	2015	2016	2017	2018	2019	2020	2021	2022
Metals	5,382	5,975	2,604	1,707	1,408	1,077	1,642	
Concrete	28,508	3,629	2,531	31,358	9,085	532	22,019	
Asphalt	370,590	194,399	158,929	85,332	138,332	106,078	185,394	
Use/Reuse of Dredged Materials					2,656,218	2,831,625	2,351,823	1,430,714

TARGET: 500,000 cubic yards dredged

**This performance measure is new to the AR.*

What Is the Trend?

- Volumes were down in FY 2023 because MPA is evaluating various tests of innovative reuse of harbor dredged material that were made over the past few years.
- MPA continues to explore and test new methods to reuse dredged material from the Port of Baltimore harbor channels.

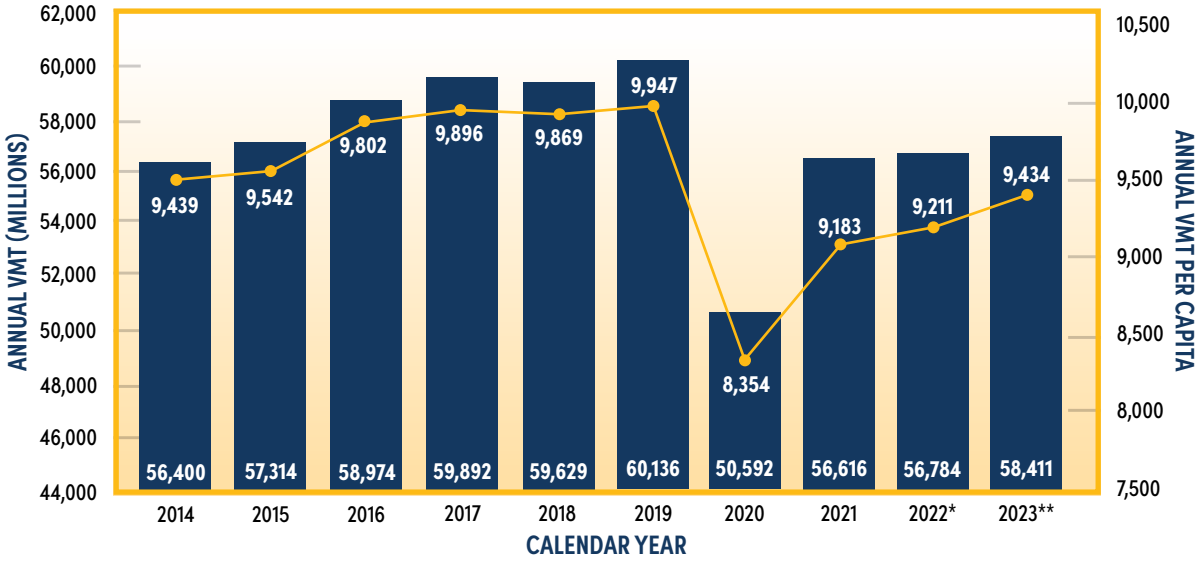
What Are Future Strategies?

- MPA has solicited private companies that used harbor dredged material for products ranging from brick to light-weight aggregate.
- MPA started to develop the Cox Creek Sediment Technology and Reuse (STAR) site to continue the advancement of the innovative reuse of dredged material.
- MPA will continue to investigate other possible uses of dredged material to meet its ultimate goal of using 500,000 cubic yards for the innovative reuse and beneficial use of harbor dredged material annually.



Objective: Minimize fossil fuel consumption, reduce GHG emissions, and improve air quality and support the growth of alternative fuels

VEHICLE MILES TRAVELED (VMT)/VMT PER CAPITA



TARGET: 10% decrease of VMT per capita by 2030 and 20% decrease by 2050

**2022 data have been revised from previous report.*

***2023 data are preliminary and subject to change.*



What Is the Trend?

- Historically, VMT is generally reflective of economic growth and conditions. That is, VMT generally increases during times of greater economic prosperity and decreases during economic depressions.
- As the traffic pattern was too unstable, 2020 was skipped as a base comparison year which is one of the factors affecting the current VMT growth.
- Starting in 2022, the previous year is used now as the base comparison. The VMT in 2022 has increased by 0.3% compared to 2021 but is down 5.6% compared to 2019 (pandemic levels). There has been a reduction in truck VMT, but passenger vehicles VMT has increased.

What Are Future Strategies?

- MDOT aims to achieve a 10% reduction in VMT per capita in the coming years, and then a 20% reduction by 2050.
- MDOT is implementing active transportation policies and infrastructure (bike lanes, shared-use paths, etc.) and promoting Transportation Demand Management (TDM) strategies and incentives (rideshare, alternative work hours, work from home, Guaranteed Ride Home, etc.) to reduce VMT.

NUMBER OF EMPLOYEE PARTNERS IN STATEWIDE TRANSPORTATION DEMAND MANAGEMENT (TDM) PROGRAMS*

TDM strategies and policies are an impactful and cost-effective way to offset vehicle congestion and reduce VMT by promoting alternatives to driving alone, such as taking transit, ridesharing, walking, biking and teleworking. Commuter Choice Maryland is MDOT's TDM program and provides options to maximize travel choices and deliver solutions that can reduce congestion, conserve energy, facilitate economic opportunity and enhance the life of all Marylanders. Commuter Choice Maryland's Employer Partner Program recognizes Maryland employers and organizations for their leadership in offering transportation benefits and creative commuting incentives to their employees.

CALENDAR YEAR	NUMBER OF EMPLOYEE PARTNERS
2021	50
2022	48

TARGET: 500 partners by 2030 and 1,000 partners by 2050

**This performance measure is new to the AR.*

What Is the Trend?

- This is a new performance measure for this year's AR. MDOT will develop a way to measure this going forward to monitor performance.
- Participation in the program has declined largely due to employers' closing, relocating out of state or focusing on other priorities as a result of the COVID-19 pandemic. However, it is understood that employers continue to offer commuter benefits that would qualify them to become an Employer Partner, and participation in the program is expected to increase as workplace commuting continues to rebound from the pandemic.

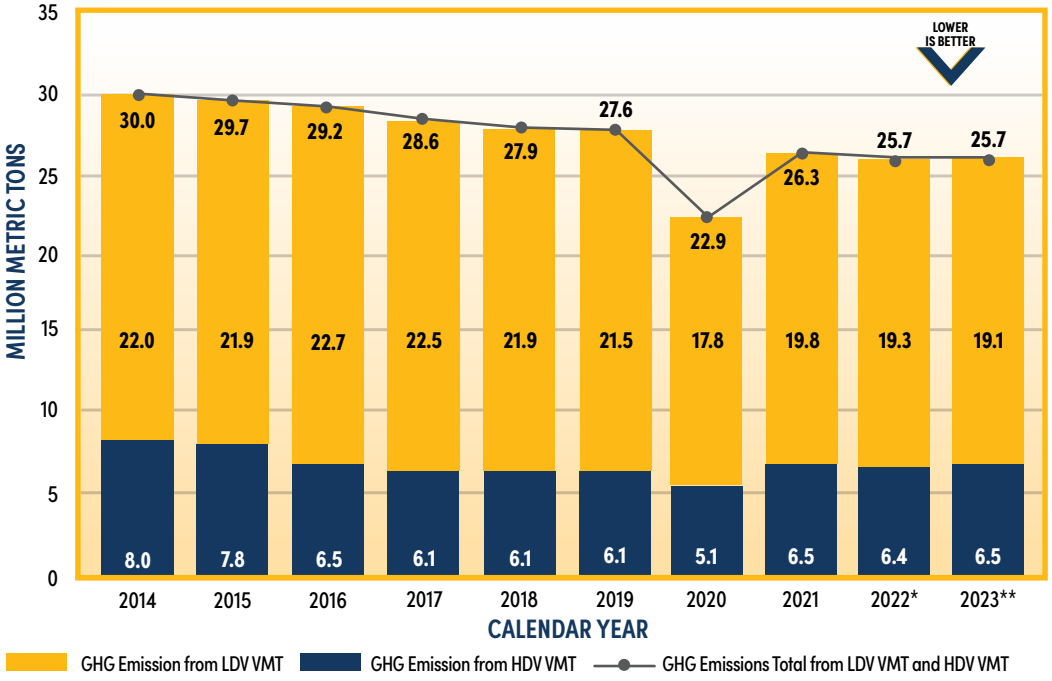
What Are Future Strategies?

- Commuter Choice Maryland continues to form strong partnerships with local TDM program managers and other state agencies including MDE, the Maryland Department of Commerce and the Maryland Department of Labor to make new connections with the employer community.
- The Employer Partner Program is constantly identifying new outreach opportunities at in-person events and through digital communications to reach employers.
- Commuter Choice Maryland continues to evaluate opportunities to incentivize participation in the Employer Partner Program by identifying employers that should be recognized for the benefits that they already provide while offering support to expand commuter benefits and incentives.



GREENHOUSE GAS (GHG) EMISSIONS FROM LIGHT-DUTY VEHICLES (LDV) VMT AND MEDIUM-HEAVY-DUTY VEHICLES (MHDV) VMT

GHG emissions from on-road vehicles is primarily a product of two trends: VMT and the efficiency of on-road vehicles. GHG reductions are achieved by reducing VMT and improving efficiency of vehicles. Reducing VMT has other potential benefits to Marylanders, such as reduced congestion and improved travel time reliability. Emissions are calculated using the most recent inventory and MOVES model available at time of analysis. MOVES3 was used for analysis years 2021-2023. EV registrations in Maryland are factored into the GHG estimate.



TARGET: Baseline target in first year

*2022 revised from previous report to reflect final 2022 HPMS.

**2023 data are preliminary and subject to change

What Are Future Strategies?

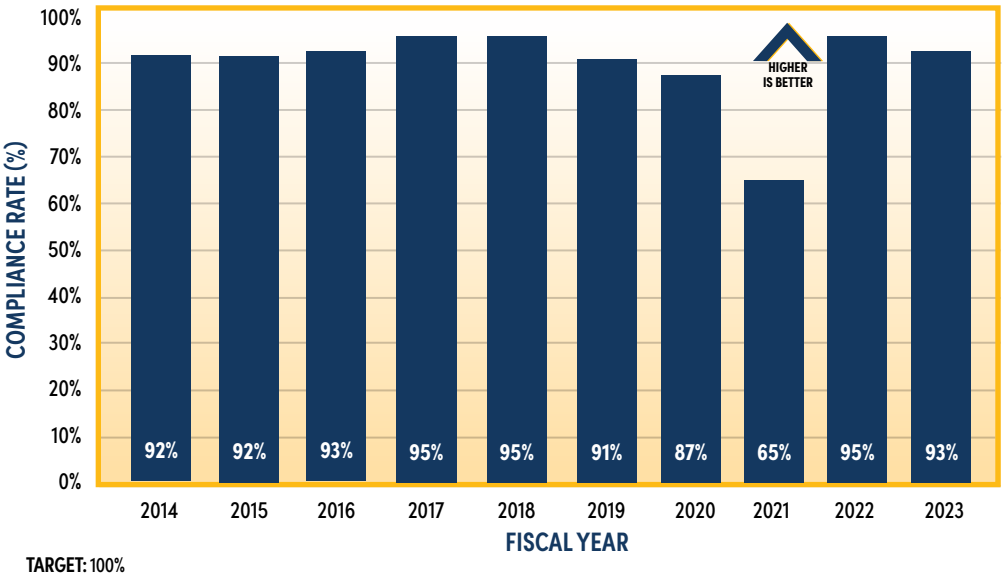
- The Federal Highway Administration (FHWA) Carbon Reduction Program (CRP) supports a variety of MDOT strategic investments that achieve carbon reduction. MDOT's Carbon Reduction Strategy (CRS) will be finalized in November 2023 in collaboration with metropolitan planning organizations (MPOs). The CRS summarizes MDOT activities to reduce carbon emissions and reflects federal, state, and regional strategies pertaining to carbon reduction.
- The passage of Advanced Clean Cars II Program (ACCII) builds on Maryland's existing Clean Cars Program and requires automakers to increase the share of ZEVs sold beginning with model year 2027 so that by model year 2035, 100% of the passenger car and light-duty truck sales are zero emission. In addition, ACCII establishes increasingly stringent emission standards for gas cars and heavier passenger trucks.
- MDOT continues to seek additional state and local organizations, nonprofits and private sector companies as partners for its Commuter Choice Maryland Employer Partner Program to help promote commuter benefits.
- MDOT continues to support local government Transportation Demand Management (TDM) programs to offer free commuter assistance and to support employers in their efforts to develop commuter benefits programs.
- Maryland continues to support and promote the adoption of low-carbon and emission reduction vehicles, including personal vehicles, school bus fleets, transit bus fleet, through legislation, incentives and rebates.

What Is the Trend?

- In July 2023, VMT was up 2.7% compared to 2022. VMT annual levels 2020 through 2022 reflected pandemic restrictions and altered travel patterns, following relatively stable annual VMT levels from 2017 through 2019. Despite growth in VMT, GHG emissions from on-road transportation continue to decline, reflecting continued improvements in vehicle fleet efficiency.
- Electrification of on-road vehicles continues to expand. EVs represent almost 1.5% of all registered vehicles in Maryland, with over 23,500 EVs newly registered between July 2022 and July 2023. Over 62 ZEV models are available for purchase in 2023 by consumers, including trucks and large vehicles, motorcycles and cars, with automakers committed to bringing more EVs to the market in 2024 and 2025.
- The Maryland Commuter Tax Credit was expanded to offer greater incentives to employers for subsidizing non-single-occupancy vehicle (SOV) commute options for employees. In addition, new rewards have been added to incenTrip and new features have been developed including customizable multimodal trip planning, an employer dashboard for workplace commute challenges, and corridor challenges that focus on incentivizing ridesharing and transit use on specific congested corridors.
- SHA's Coordinated Highways Action Response Team (CHART) program continues to reduce congestion and improve travel efficiency by responding to incidents and clearing obstructions from the highway quickly. In 2022, CHART provided 63,474 incident responses and disabled vehicle assists, with an average incident response time of 11.97 minutes.

STATEWIDE VEHICLE EMISSIONS INSPECTION PROGRAM (VEIP) TESTING COMPLIANCE RATE

MAKING PROGRESS





TARGET: 100%

What Is the Trend?

- Statewide VEIP testing compliance rate has been high in the most recent two years at 93% and 95% in 2023 and 2022, respectively. This is a considerable increase from 2021 and 2020 when the compliance rate dropped to 65% and 87%, respectively. The present higher percentages of compliance reflect the long-term trend of a compliance rate greater than 90% that has occurred for most years since 2014.

What Are Future Strategies?

- MVA is identifying opportunities to engage with customers about the VEIP program and their due dates.
- MVA is no longer requiring vehicle models 2019 or newer to start inspections three years after purchase and instead these vehicles do not require testing for the first six years of the vehicle's life.

Objective: Support the widespread adoption of alternative fuels, EVs and innovative technologies

PERCENTAGE OF MDOT FLEET COMPOSED OF ELECTRIC VEHICLES (EVs)*

MDOT is working on developing this performance measure and collecting data across all MDOT modes for next year.

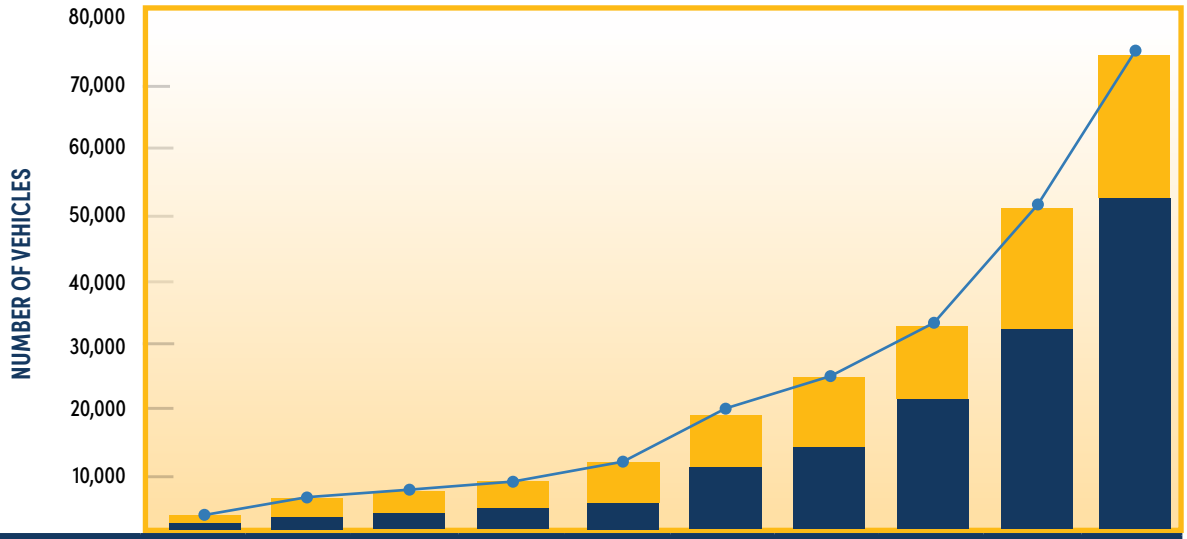
TARGET: Target being developed for next year's report

**This performance measure is new to the AR.*



PERCENT OF ELECTRIC VEHICLES (EVs) REGISTERED FROM TOTAL REGISTERED VEHICLES

Reducing emissions from on-road vehicles is a priority of the Administration, and a paramount strategy in reducing transportation-related GHG emissions in the near-term. By increasing the percentage of EVs from total registered vehicles, Maryland will reduce VMT from internal combustion engine vehicles that rely on carbon-intensive fuels, subsequently lowering GHG emissions. This percentage consists of the number of light-duty, registered EVs in the state out of the total number of light-duty, registered vehicles. EVs include both Battery Electric Vehicles (BEVs) and Plug-in Hybrid Electric Vehicles (PHEVs).



FISCAL YEAR	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
BEV	1,421	1,943	2,643	3,745	5,495	10,938	14,930	21,076	33,230	52,008
PHEV	1,757	3,521	4,345	5,624	7,712	9,784	10,812	13,765	19,089	23,853
BEV + PHEV	3,178	5,464	6,988	9,369	13,207	20,722	25,742	34,841	52,319	75,861
% EVs of total Registered Vehicles	0.1%	0.1%	0.1%	0.2%	0.3%	0.4%	0.5%	0.7%	1.0%	1.5%
Total Registered Vehicles	4,872,481	4,950,019	4,992,358	5,030,505	5,086,501	5,126,010	5,159,469	5,084,777	5,231,513	5,151,222

TARGET: 1.1 million EVs in 2030

Source: MVA Office of Data Management, EV Registration Data 6/30/2023

What Is the Trend?

- 23,542 EVs were newly registered in Maryland in the 12-month period between July 2022 and July 2023, representing 45% growth in the number of EVs on the road.
- Of the 23,542 newly registered EVs, over 18,700 were BEVs and over 4,700 were PHEVs. In FY 2019, BEVs overtook PHEVs as having the largest EV market share in Maryland.

What Are Future Strategies?

- With the Advanced Clean Cars II program (ACC II) in 2023, which will require auto manufacturers to continuously increase the share of EVs sold in the state beginning with model year 2027, Maryland is expected to reach approximately 1.34 million registered EVs by 2031.
- Consumers are taking advantage of the amended Maryland EV Tax Credit that took effect July 1, 2023, which allows buyers to claim a State tax credit up to $3,000 for their purchase of a new EV. The tax credit will be in effect through June 30, 2027.

LEVEL 2 AND DC FAST CHARGING PORTS PER 1,000 RESIDENTS*

The expansion of public EV charging infrastructure in Maryland will be necessary to support Maryland's projected growth to more than 1 million EVs registered by 2030. These future EV registrations are a component of ensuring that Maryland meets air quality and GHG reduction goals. Level 2 charging stations are ideal for locations where there would be longer dwell times, and provide approximately 20 miles of driving range for each hour charging. DC Fast charging stations are ideal for locations with shorter dwell times, such as along highways or commercial sites, and provide approximately 200 miles of driving range for each hour charging.

FISCAL YEAR	VALUE
2023	0.62 charging ports per a thousand residents**

TARGET: Target being developed for next year's report

**This performance measure is new to the AR.*

***Souces: Charging Ports data: Alternative Fuel Data Center 6/30/2023 download; Population data: 7/1/2022 Population Estimates from the US Census, MD Population: 6,164,660.*

What Is the Trend?

- At mid-year, there were more than 1,400 publicly accessible charging stations in Maryland with more than 3,900 charging ports. Approximately 20% of public charging ports are DC fast chargers.
- MDOT completed the 2023 update of the Maryland National Electric Vehicle Infrastructure (NEVI) Plan and submitted it to the Joint Office on August 1, 2023. The Plan outlines the approach for deploying charging infrastructure and achieving the goals of the federal NEVI Program.
- MDOT prepared to launch the Maryland NEVI Program by issuing two Requests for Information (RFIs) to interested stakeholders. The first RFI solicited information pertinent to program funding and costs. The second RFI solicited information pertinent to data collection and reporting.
- MDOT developed and launched an EV Charger Siting Tool to assist potential applications to the NEVI and CFI programs. The interactive tool consolidates data from a variety of state and federal agencies to help determine whether a site would a good candidate for grant funding.

What Are Future Strategies?

- MDOT will release its NEVI Program Round 1, with a goal of awarding contracts for installations of DC Fast chargers along Maryland's 23 EV Alternative Fuel Corridors (AFCs). Through the NEVI Program, MDOT aims to support the establishment of an interconnected network that will facilitate data collection, equitable access and network reliability.
- MDOT coordinated with local jurisdictions and Maryland Clean Energy Center (MCEC) on their applications to the federal CFI grant program. Successful grant applications will secure CFI grant funds for community and corridor charging installations.
- Under MDOT's Leadership, the Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC) is dedicated to accelerating the adoption of EVs and expanding EV infrastructure to support EVs.



Appendix B.2 - MDTA Earth Day Presentation and Photos

2023 MDTA EARTH DAY EVENT





2024 MDTA EARTH DAY EVENT












Tornado



1

What is Stormwater?

Rain or snowmelt that runs off the land





2



3



Image from Boston Water & Sewer Commission

4

QUALITY
Polluted runoff



QUANTITY
Too much runoff



5



6

Why is Clean Water Important?

- We drink it!
- Recreation
- Food
- Jobs
- Tourism



7



What Does MDTA Do?



8

Good Housekeeping



9



Treatment

10

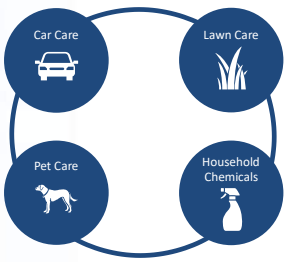


Environmental Stewardship

11



What can you do?



12





Car Care

13







Lawn Care

14










Pet Care

15







Household Chemicals

16



17

Appendix B.3 - 2024 Turner Station Earth Day Event Photos



Spring into Action!

TURNER STATION COMMUNITY DAY AND... EARTH DAY CELEBRATION

Socialize | Celebrate | Learn | Give Back

Here's your opportunity to give back to Mother Earth and the historic Turner Station community as we come together to garden, pick up trash, and learn more about the role we all play in the environment.

SATURDAY APRIL 20

7AM - 12PM

7:00 AM - 7:30 AM
Volunteer Check-In and Continental Breakfast

7:30 AM - 8:00 AM
Community Day Kick Off and Welcome

8:00 AM - 11:00 AM
Community Clean-Up and Earth Day Activities

11:15 AM - 11:40 AM
Group Photo & Closing

11:45 AM - 12:00 PM
Lunch In Park

THIS IS A FAMILY-FRIENDLY EVENT

Register at **2024TurnerStationEarthDay.eventbrite.com**

Turner Station Park: 23 Rayme Road Dundalk, MD 21222

THANKS TO OUR COMMUNITY PARTNERS

Turner Station Conservation Teams

PORTS AMERICA CHESAPEAKE

The Nature Conservancy

Alpha Kappa Alpha Sorority, Inc.® Alpha Beta Gamma Omega Chapter

PORT OF BALTIMORE 1706 Helen Delich Bentley

MDTA Maryland Transportation Authority

MD DriveEzMD E-ZPass MARYLAND

2024 TURNER STATION EARTH DAY EVENT














MDTA
Maryland
Transportation
Authority














Maryland
Transporta
Authority
MDTA


Scott
BROWN MULCH



Appendix C: MCM No. 3 - Illicit Discharge Detection and Elimination (IDDE) Supporting Documentation

Appendix C.1 - IDDE Outfalls



N

1 inch = 7 miles

0 4 8 16 Miles

MDTA IDDE Inspection Outfall Sites

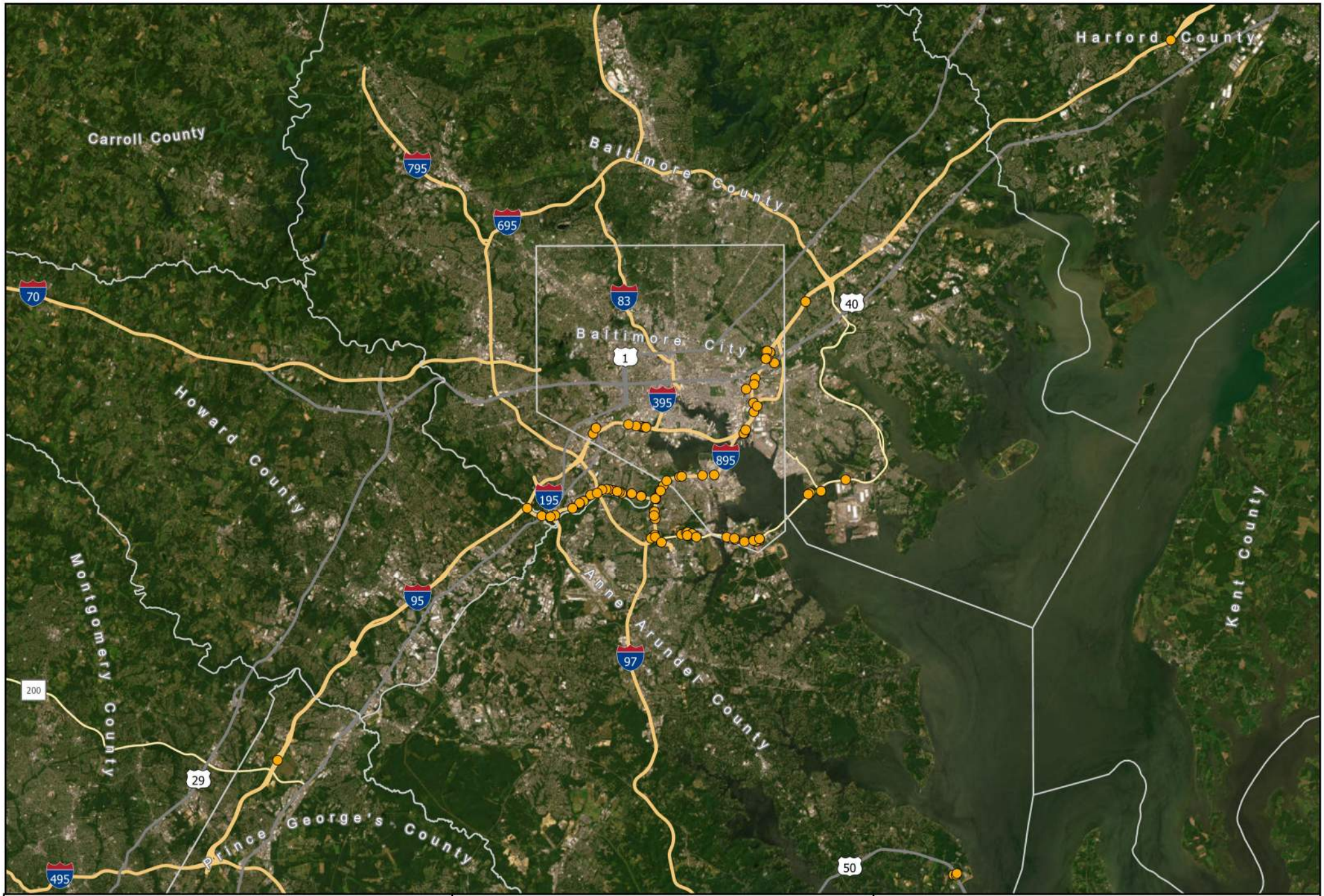
County Boundary

MDTA Facility

Outfall Site

Map prepared September 2024

Imagery Credits: Earthstar Geographics



N

1 inch = 5 miles

0 2.5 5 10 Miles

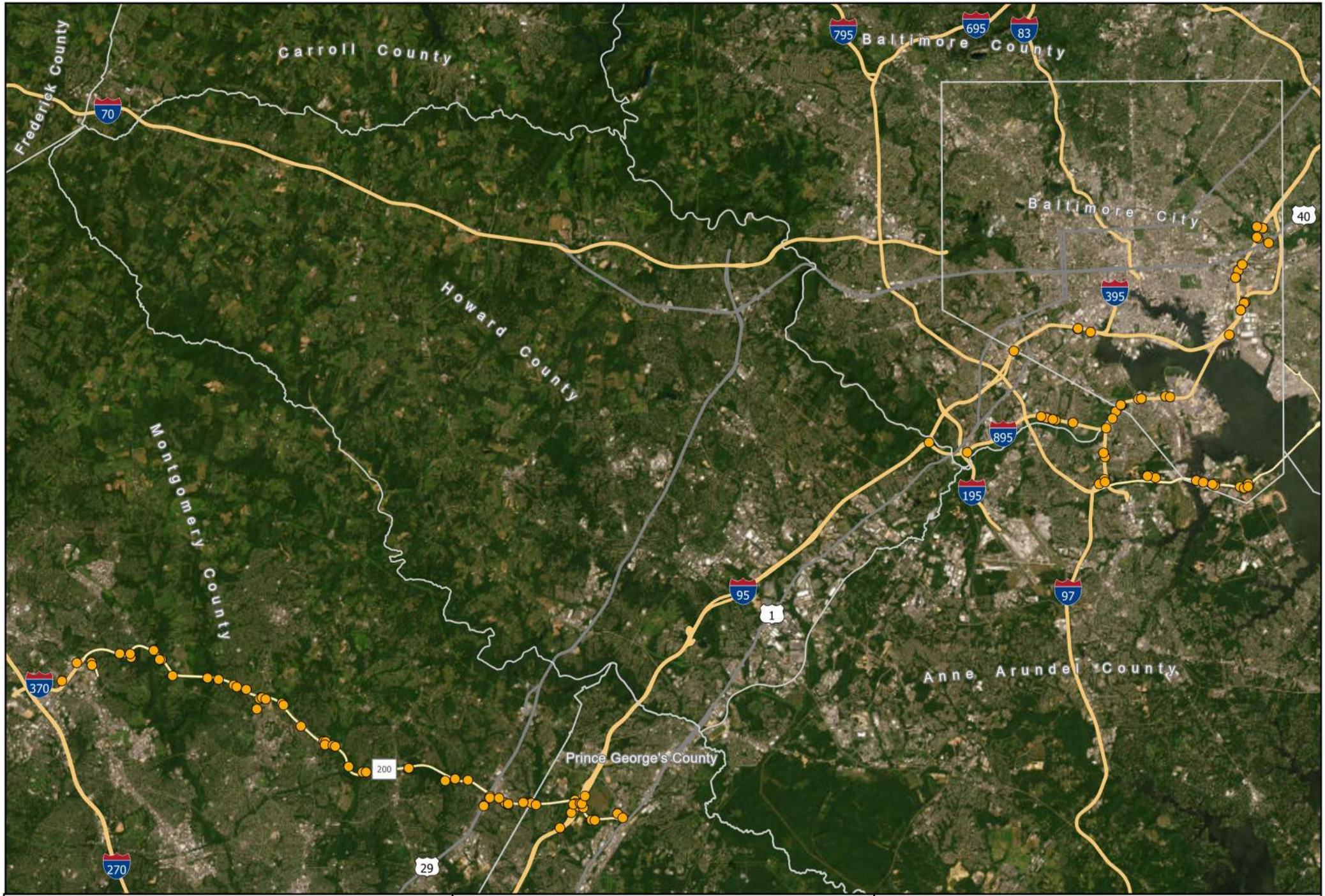
MDTA IDDE Inspection Outfall Sites - FY 2023

County Boundary

Outfall Site selection

Map prepared September 2024

Imagery Credits: Earthstar Geographics



N

1 inch = 3 miles

0 1.75 3.5 7 Miles

MDTA IDDE Inspection Outfall Sites - FY 2024

County Boundary

Outfall Site selection

Map prepared September 2024

Imagery Credits: Earthstar Geographics

Appendix C.2 - FY23 IDDE Outfall Inspection Report Executive Summary

Applying Practical Science to Improve Communities

Illicit Discharge Detection and Elimination Outfall Inspections

Maryland Transportation Authority



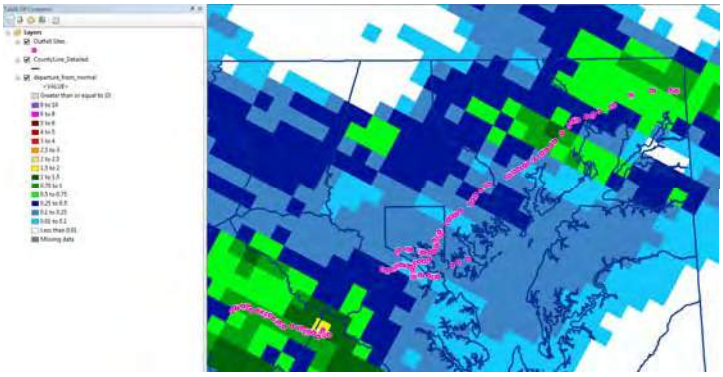
Fiscal Year 2023

Fort McHenry Tunnel, Baltimore Harbor Tunnel, Intercounty Connector, Francis Scott Key Bridge, John F. Kennedy Memorial Bridge, and the Bay Bridge

42 North Main Street | Bel Air, Maryland 21014
410-893-9016 | info@cemscience.com | cemscience.com
@cemscience | cemscience | Chesapeake Environmental Management, Inc.

Executive Summary

The Maryland Department of Transportation Maryland Transportation Authority (MDOT MDTA) maintains coverage under a National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II permit for State and Federal Agencies. MDTA property consists of roadways and campuses which are located in watersheds that range from rural to highly-urbanized. The Phase II permit was issued by the Maryland Department of Environment (MDE) and it includes requirements to comply with the six minimum control measures (MCMs): Personal Education and Outreach; Public or Personnel Involvement and Participation; Illicit Discharge Detection and Elimination (IDDE); Construction Site Stormwater Runoff Control; Post Construction Stormwater Management; and Pollution Prevention and Good Housekeeping. The IDDE program is one of the six MCMs that MDOT MDTA must adhere to. As such, MDOT MDTA is required to conduct field screening of their outfalls to identify any potential sources of an illicit discharge and eliminate any illegal connections or illicit discharges that enter the storm drain system. Per the permit requirements, large properties (such as MDTA properties that exceed 2,000 acres in size) are required to screen 20% of their outfalls per year, up to 100 outfalls.



MDTA outfalls with NWS base map

For fiscal year (FY) 2022, the CEM team was contracted to perform IDDE field investigations at one hundred and nine (109) outfalls associated with six (6) MDTA properties: Fort McHenry Tunnel (I-95 and I-395), Baltimore Harbor Tunnel (I-895), Intercounty Connector (MD 200), Francis Scott Key Bridge (I-695), John. F. Kennedy Memorial Highway (I-95), and William Preston Lane Jr. Memorial Bay Bridge (US 50/301) during June 2023. If a dry weather flow was detected, the sampled water was tested for the following parameters using field test kits: temperature, pH, chlorine, phenol, copper and detergents. The outfalls were also inspected for structural integrity and structural deficiencies were recorded as a part of the investigations.

CEM prepared field maps based on the Geographic Information System (GIS) data provided by MDOT MDTA. For the planning and scheduling of field inspections and weather tracking, CEM used an available base map from the National

Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) web site. IDDE screening requires three days of no precipitation events greater than 0.1 inch. The NOAA NWS base map provides daily rain totals that can be used within a GIS platform which enabled CEM staff to accurately estimate if the total precipitation at each of the outfalls was above the minimum of 0.10 inch of rain. This mapping allowed CEM to efficiently assess whether the three-day dry weather requirement for IDDE could be met prior to mobilizing the field teams.

Of the one hundred and eighteen (109) outfalls investigated, field test kits were used to measure the above-mentioned parameters for the six (6) outfalls that were observed to have dry weather flow. Of the six (6) outfalls that were tested for illicit discharge, there were no measurements that were determined to exceed their respective allowable thresholds. Forty-seven (47) outfalls were observed to have structural deficiencies or other concerns and thirty-six (36) outfalls had access issues or were unable to be located in the field. Provided below is the summary of inspections.

1. **Fort McHenry Tunnel (I-95 and I-395)**. Fifteen (15) outfalls total were inspected. Five (5) outfalls had moderate structural concerns or required maintenance. One (1) outfall was observed to have dry-weather flow with parameters measured below their respective threshold criteria. Seven (7) outfalls were unable to be inspected due to access issues or were unable to be located in the field, based on the mapped location. The remaining two (2) outfalls appeared to be functioning properly with no observed concerns.
2. **Baltimore Harbor Tunnel (I-895)**. Seventy (70) outfalls total were inspected. Twenty-six (26) outfalls had moderate structural concerns or required maintenance (one of which had dry-weather flow observed with parameters measured below their respective threshold criteria). Two (2) additional outfalls were observed to have dry-weather flow with parameters measured below their respective threshold criteria. Twenty-seven (27) outfalls were unable to be inspected due to access issues or were unable to be located in the field, based on the mapped location. The remaining fifteen (15) outfalls appeared to be functioning properly with no observed concerns.
3. **Intercounty Connector (MD 200)**. One (1) outfall total was inspected and was observed to be functioning properly with no observed concerns.
4. **Francis Scott Key Bridge (I-695)**. Eighteen (18) outfalls total were inspected. Eleven (11) outfalls had moderate structural concerns or required maintenance (one of which had dry-weather flow observed with parameters measured below their respective threshold criteria). Two (2) outfalls were unable to be located in the field,

based on the mapped locations. The remaining five (5) outfalls appeared to be functioning properly with no observed concerns.

5. **John F. Kennedy Memorial Highway (I-95)**. Two (2) outfalls total were inspected. One (1) outfall was observed to have dry weather flow with parameters measured below their respective threshold criteria. The remaining one (1) outfall appeared to be functioning properly with no observed concerns.
6. **William Preston Lane Jr. Memorial Bridge (US 50/301)**. Three (3) outfalls total were inspected. One (1) outfall had moderate structural concerns or required maintenance. The remaining two (2) outfalls appeared to be functioning properly with no observed concerns.

The attached individual reports for each outfall include additional details about the observations associated with each structure, as well as the details regarding the field sampling that was performed.

Outfall Number	Dry Flow Observed (Yes or No)	Comments			
		Flow	Flowing With Issues	Structural Concerns or Maintenance Required	No Access
Fort McHenry Tunnel (I-95 and I-395)					
FT00038.010	No	Significant concrete erosion observed in downstream channel. Monitor concrete erosion and repair as needed.			
FTEH00007	No	Concrete apron sits approximately 1 foot higher than channel. Channel consists of sand/stone and water was observed ponded. Repair channel to connect to outfall structure.			
FTEH00033	No	Erosion observed along banks and channel. Remove debris from mouth of pipe. Continue to monitor channel leading to stream.			
FTEH00045	n/a	Structure was not located. No structure was observed in the area.			
FTEH00049	No	Trees and roadside debris observed as being accumulated in mouth of pipe. Remove blockages from mouth of pipe and channel.			
FTEH00052	Yes	Flow observed and sample collected, but no evidence of illicit discharges detected. No other recommendations at this time.			
FTEH00069	No	Structure appears to be functioning properly. No other recommendations at this time.			
FTEH00071	No	Minor erosion observed behind headwall. But headwall is 12' high and doesn't impact function of structure. Continue to monitor erosion and repair as needed.			
FTEH00072	n/a	Structure was not located. Unable to complete inspection due to presence of homeless camp and tents setup around structures.			
FTEH00073	n/a	Structure was not located. Unable to complete inspection due to presence of homeless camp and tents setup around structures.			
FTEH00075	n/a	Structure was not located. Unable to complete inspection due to presence of homeless camp and tents setup around structures.			
FTEH00077	No	Roadside debris, leaves, and sediment beginning to restrict flow. Remove debris from mouth of pipe and channel.			
FTEH00078	n/a	Structure was not located. No structure was observed in the area.			
FTEH00096	n/a	Structure was not located. No structure was observed in the area.			
FTMH00285	n/a	Structure was not located. No structure was observed in the area.			
Baltimore Harbor Tunnel (I-895)					
HT00006.010	No	Structure appears to be functioning properly. Remove vegetation from banks before encroaching into channel.			
HT00008.010	n/a	Structure was not located. No structure was observed in the area.			
HT00024.010	No	Structure located along edge of SWM pond and base of pipe submerged in mud/water. Remove sediment from mouth of pipe if possible.			
HT00029.010	No	Structure appears to be functioning properly. Continue to monitor vegetation and maintain as needed.			
HT00030.010	No	Vegetation beginning to encroach on pipe opening and may eventually obstruct flow. Remove vegetation from mouth of pipe.			
HT00031.010	No	Debris and phragmites blocking mouth of pipe and may eventually obstruct flow. Remove debris and unblock lower portion of pipe.			
HT00032.010	No	Vegetation beginning to encroach on mouth of pipe and causing sediment to accumulate in channel. Remove sediment from mouth of pipe/channel and monitor vegetation growth.			
HT00033.010	No	Vegetation growing and sediment accumulating in mouth of pipe. Remove vegetation from mouth of pipe.			
HT00036.010	No	Significant sediment accumulating in mouth of pipe which is impacting flow. Uncover pipe to restore flow from pipe.			
HT00042.013	n/a	Structure was not located. No structure was observed in the area.			
HT00055.010	Yes	Flow observed and sample collected, but no evidence of illicit discharges detected. Potentially repair hole in fence.			
HT00073.010	No	Structure appears to be functioning properly. No other recommendations at this time.			

Outfall Number	Dry Flow Observed (Yes or No)	Comments			
		Flow	Flowing With Issues	Structural Concerns or Maintenance Required	No Access
Baltimore Harbor Tunnel (I-895) cont.					
HT00078.010	No	Concrete channel is deteriorating and may restrict flow in areas. Monitor condition of concrete in deteriorating areas and repair as needed.			
HT00082.010	No	Structure appears to be functioning properly. No other recommendations at this time.			
HT00084.010	No	Structure appears to be functioning properly. No other recommendations at this time.			
HT00086.010	No	Structure conveys stream flow and appears to be functioning properly. Potentially repair the hole in the fence.			
HT00086.011	No	Floating debris has accumulated against metal gate preventing access to pipe. Recommend removing debris from front of gate to increase flow. Repair hole in fence as needed.			
HT00109.015	No	Grass appears to be overgrown and starting to encroach on pipe, but structure appears to be functioning properly. Remove grass clippings and debris from channel.			
HT00117.017	No	Structure appears to be functioning properly. No other recommendations at this time.			
HT00122.010	No	Structure located in low-lying/depressional grass area where roadside debris and grass clippings accumulates. Remove debris and grass to improve function.			
HT00123.011	n/a	Structure was not located. No structure was observed in the area.			
HT00131.010	n/a	Structure was not located. No structure was observed in the area.			
HT00137.010	No	Structure appears to be functioning properly. No other recommendations at this time.			
HT00144.010	No	Structure located along egde of stream, so water is backed up into pipe. However, structure appears to be functioning properly. No other recommendations at this time.			
HTEH00006	No	Structure appears to be functioning properly. No other recommendations at this time.			
HTEH00012	n/a	Structure was located behind fence and unable to be located/inspected.			
HTEH00016	n/a	Structure was located behind fence and unable to be located/inspected.			
HTEH00018	No	Vegetation beginning to encroach on channel and obscuring location of structure. Remove vegetation to improve access to structure.			
HTEH00020	No	Grass and woody debris growing in mouth of pipe and may eventually obstruct flow. Remove grass and woody debris from pipe.			
HTEH00021	No	Minimal roadside debris in channel but structure appears to be functioning properly. No other recommendations at this time.			
HTEH00027	n/a	Structure was not located. No structure was observed in the area.			
HTEH00029	n/a	Structure was not located. No structure was observed in the area.			
HTEH00033	n/a	Structure was not located. No structure was observed in the area.			
HTEH00042	n/a	Structure was not located. No structure was observed in the area.			
HTEH00046	n/a	Structure was not located. No structure was observed in the area.			
HTEH00050	No	Early stages of concrete cracking observed around base of pipe, but structure appears to be functioning properly. Monitor base of pipe and repair as necessary.			
HTEH00051	No	Sediment and debris accumulating in mouth of pipe and appears to be restricting flow. Sediment and debris should be removed from pipe and channel.			
HTEH00054	n/a	Structure was not located. No structure was observed in the area.			
HTEH00056	n/a	Structure was not located. No structure was observed in the area.			
HTEH00064	No	Significant woody debris blocking downstream inlet at end of concrete channel. Remove woody debris from end of concrete channel to improve flow.			

Outfall Number	Dry Flow Observed (Yes or No)	Comments			
		Flow	Flowing With Issues	Structural Concerns or Maintenance Required	No Access
Baltimore Harbor Tunnel (I-895) cont.					
HTEH00069	No	Vegetation beginning to encroach on channel. Downstream channel appears to have minor areas of deterioration in the concrete channel. Remove vegetation from mouth of pipe and continue to monitor downstream channel.			
HTEH00070	No	Apron at mouth of pipe has some visible deterioration but functioning properly. Remove vegetation from top of headwall and continue to monitor deteriorating apron.			
HTEH00073	No	Pipe completely buried and all flow is obstructed. Uncover pipe to restore flow from pipe.			
HTEH00078	n/a	Structure was not located. No structure was observed in the area.			
HTEH00080	Yes	End of pipe disconnected from rest of structure. Flow observed and sample collected, but no evidence of illicit discharges detected. Pipe should be reconnected and scoured areas of pool should be restored.			
HTEH00081	n/a	Structure was not located. No structure was observed in the area.			
HTEH00085	n/a	Structure was located behind fence and unable to be located/inspected.			
HTEH00090	No	Structure located along edge of SWM pond and base of pipe is submerged in mud/water. Remove sediment from mouth of pipe if possible.			
HTEH00092	n/a	Structure was located behind fence and unable to be located/inspected.			
HTEH00095	n/a	Structure was not located.			
HTEH00101	n/a	Structure was located behind fence and unable to be located/inspected.			
HTEH00102	Yes	Structure appears to be functioning properly. Potentially repair hole in fence.			
HTEH00104	n/a	Structure was located behind fence and unable to be located/inspected.			
HTEH00106	n/a	Structure was not located.			
HTEH00107	n/a	Structure was not located.			
HTEH00113	No	Structure appears to be functioning properly. No other recommendations at this time.			
HTEH00119	No	Vegetation obscures view of channel, but structure appears to be functioning properly. Remove vegetation from headwall and channel banks.			
HTEH00124	No	Vegetation obscuring structure making it difficult to locate, but structure appears to be functioning properly. Remove vegetation from headwall and channel banks.			
HTEH00141	n/a	Structure was located behind fence and unable to be located/inspected.			
HTEH00173	n/a	Structure was not located. No structure was observed in the area.			
HTEH00223	No	Sediment and woody debris accumulating in mouth of pipe and channel. Remove sediment and woody debris from mouth of pipe and channel.			
HTEH00229	No	Significant issues observed that impact overall function of structure. Entire structure and channel needs repair.			
HTEH00233	No	Structure appears to have been replaced with new ditch and sand bags. Current structure appears to be functioning properly. No other recommendations at this time.			
HTEH00235	No	Water backed up into pipe, but appropriate due to location on stream. Appears to be functioning properly. No other recommendations at this time.			
HTEH00245	n/a	Structure was not located. No structure was observed in the area.			
HTEH00246	No	Sediment accumulation beginning to impact flow. Recommend removing sediment to restore function.			
HTEH00250	n/a	Structure was not located. No structure was observed in the area.			

Outfall Number	Dry Flow Observed (Yes or No)	Comments			
		Flow	Flowing With Issues	Structural Concerns or Maintenance Required	No Access
Baltimore Harbor Tunnel (I-895) cont.					
HTEH00269	No	Roadside debris and sediment accumulating in mouth of pipe and channel. Recommend removing debris and sediment to improve function.			
HTEH00283	No	Roadside debris and sediment accumulating in mouth of pipe and channel. Recommend removing debris and sediment to improve function.			
HTEH00294	n/a	Structure was not located. No structure was observed in the area.			
Intercounty Connector (ICC) / MD 200					
IC0291.010	No	Structure appears to be functioning properly. No other recommendations at this time.			
Francis Scott Key Bridge (I-695)					
KBEH00011	No	Structure appears to be functioning properly. No other recommendations at this time.			
KBEH00012	n/a	Structure was not located. No structure was observed in the area.			
KBEH00015	No	Structure appears to be functioning properly. No other recommendations at this time.			
KBEH00022	No	Debris and leaves collecting in rip rap pool. Remove debris and leaves to restore flow path.			
KBEH00023	No	Pipe partially collapsed and beginning to deteriorate, but still appears to be functioning properly. Monitor condition of pipe and repair as needed to maintain function.			
KBEH00027	n/a	Structure was not located			
KBEH00038	Yes	Left channel appears to be functioning properly, but other two channels have significant debris accumulations. Consider removing debris from center and right channel.			
KBEH00042	No	Edge of pipe beginning to delaminate. Continue to monitor pipe lining and repair as needed.			
KBEH00045	No	Structure appears to be functioning properly. No other recommendations at this time.			
KBEH00046	No	Majority of pipe is buried in sediment and flow path appears to be impacted. Uncover pipe to restore original function.			
KBEH00048	No	Structure appears to be functioning properly. No other recommendations at this time.			
KBEH00052	No	Majority of pipe is buried in sediment and flow path appears to be impacted. Uncover pipe to restore original function.			
KBEH00053	No	Majority of pipe is buried in sediment and flow path appears to be impacted. Remove excess sediment to restore flow path			
KBEH00068	No	Sediment accumulated in front of pipe, but structure appears to be functioning properly. Continue to monitor and remove sediment if it begins to impact flow.			
KBEH00082	No	Pipe is deteriorating but does not appear to receive much flow. May still be functioning properly. Continue to monitor pipe corrosion and repair as needed.			
KBEH00083	No	Portion of pipe is missing. Part of pipe has deteriorated. Repair pipe to restore original function.			
KBEH00097	No	Sediment accumlated in front of pipe, but still apepars to be functioning. Continue to monitor and remove sediment as needed to improve flow.			
KBEH00101	No	Vegetation beginning to encroach on channel, but structure appears to be functioning properly. Remove vegetation from channel banks.			
John F. Kennedy Memorial Highway (I-95)					
KHEH00442	Yes	Vegetation beginning to grow over headwall and encroaching on channel, but structure appears to be functioning properly. Remove vegetation from headwall and channel banks.			
KHEH00872	No	Structure appears to be functioning properly. No other recommendations at this time.			

Outfall Number	Dry Flow Observed (Yes or No)	Comments			
		Flow	Flowing With Issues	Structural Concerns or Maintenance Required	No Access
William Preston Lane Jr. Memorial Bridge (US 50/301)					
LBEH00017	No	Structure appears to be functioning properly. No other recommendations at this time.			
LBEH00019	No	Structure appears to be functioning properly. No other recommendations at this time.			
LBEH00037	No	Majority of pipe is buried in sediment and portion of pipe is deteriorating. Repair pipe and remove sediment to restore original function.			

Appendix C.3 - FY24 IDDE Outfall Inspection Report Executive Summary

Applying Practical Science to Improve Communities

Illicit Discharge Detection and Elimination Outfall Inspections

Maryland Transportation Authority



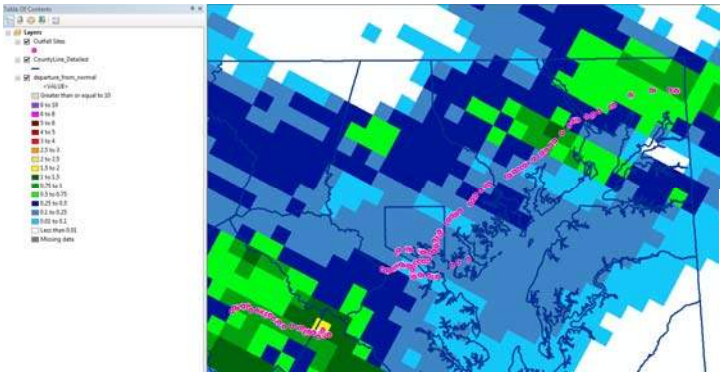
Fiscal Year 2024

Fort McHenry Tunnel, Baltimore Harbor Tunnel, Intercounty Connector, and Francis Scott Key Bridge

42 North Main Street | Bel Air, Maryland 21014
410-893-9016 | info@cemscience.com | cemscience.com
@cemscience | cemscience | Chesapeake Environmental Management, Inc.

Executive Summary

The Maryland Department of Transportation Maryland Transportation Authority (MDOT MDTA) maintains coverage under a National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II permit for State and Federal Agencies. MDTA property consists of roadways and campuses which are located in watersheds that range from rural to highly-urbanized. The Phase II permit was issued by the Maryland Department of Environment (MDE) and it includes requirements to comply with the six minimum control measures (MCMs): Personal Education and Outreach; Public or Personnel Involvement and Participation; Illicit Discharge Detection and Elimination (IDDE); Construction Site Stormwater Runoff Control; Post Construction Stormwater Management; and Pollution Prevention and Good Housekeeping. The IDDE program is one of the six MCMs that MDOT MDTA must adhere to. As such, MDOT MDTA is required to conduct field screening of their outfalls to identify any potential sources of an illicit discharge and eliminate any illegal connections or illicit discharges that enter the storm drain system. Per the permit requirements, large properties (such as MDTA properties that exceed 2,000 acres in size) are required to screen 20% of their outfalls per year, up to 100 outfalls.



MDTA outfalls with NWS base map

For fiscal year (FY) 2024, the CEM team was contracted to perform IDDE field investigations at one hundred fifteen (115) outfalls and ten (10) alternative outfalls associated with four (4) MDTA properties: Fort McHenry Tunnel (I-95), Baltimore Harbor Tunnel (I-895), Intercounty Connector (MD 200), and Francis Scott Key Bridge (I-695) between June 2024 and September 2024. If a dry weather flow was detected, the sampled water was tested for the following parameters using field test kits: temperature, pH, chlorine, phenol, copper and detergents. The outfalls were also inspected for structural integrity and structural deficiencies were recorded as a part of the investigations.

CEM prepared field maps based on the Geographic Information System (GIS) data provided by MDOT MDTA. For the planning and scheduling of field inspections and weather tracking, CEM used an available base map from the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) web site. IDDE screening requires at least seventy-two (72) hours of no precipitation events greater than 0.1 inch. The NOAA NWS base map provides daily

rain totals that can be used within a GIS platform which enabled CEM staff to accurately estimate if the total precipitation at each of the outfalls was above the minimum of 0.10 inch of rain. This mapping allowed CEM to efficiently assess whether the three-day dry weather requirement for IDDE could be met prior to mobilizing the field teams.

Of the one hundred and twenty-five (125) outfalls investigated, field test kits were used to measure the above-mentioned parameters for the thirteen (13) outfalls that were observed to have dry weather flow. Of the thirteen (13) outfalls that were tested for illicit discharge, there were no measurements that were determined to exceed their respective allowable thresholds. Fifty-six (56) outfalls were observed to have structural deficiencies or other concerns and thirty-three (33) outfalls had access issues. Provided below is the summary of inspections.

1. **Fort McHenry Tunnel (I-95)**. Ten (10) outfalls total were inspected. Eight (8) outfalls had moderate structural concerns or required maintenance (two of which also had dry weather flow observed). One (1) outfall was unable to be inspected due to access issues. The remaining one (1) outfall appeared to be functioning properly with no observed concerns.
2. **Baltimore Harbor Tunnel (I-895)**. Thirty-four (34) outfalls total were inspected. Fifteen (15) outfalls had moderate structural concerns or required maintenance (two of which also had dry weather flow observed). Fourteen (14) outfalls were unable to be inspected due to access issues. The remaining five (5) outfalls appeared to be functioning properly with no observed concerns.
3. **Intercounty Connector (MD 200)**. Sixty-six (66) outfalls total were inspected. Twenty-eight (28) outfalls had moderate structural concerns or required maintenance (one of which also had dry weather flow). Eight (8) additional outfalls had dry weather flow with parameters measured below their respective thresholds. Twelve (12) outfalls were unable to be inspected due to access issues. The remaining eighteen (18) outfalls appeared to be functioning properly with no observed concerns.
4. **Francis Scott Key Bridge (I-695)**. Fifteen (15) outfalls total were inspected. Five (5) outfalls had moderate structural issues or required maintenance. Six (6) outfalls were unable to be inspected due to access issues. The remaining four (4) outfalls appeared to be functioning properly with no observed concerns.

The attached individual reports for each outfall include additional details about the observations associated with each structure, as well as the details regarding the field sampling that was performed.

Outfall Number	Dry Flow Observed? (Yes or No)	Comments			
		Flow	Flowing with Issues	Structural Concerns or Maintenance Required	No Access
Fort McHenry Tunnel (I-95 and I-395)					
FT00001.010	No	Concrete was observed as being lodged in the pipe, as well as stone material accumulated in the channel. Recommend restoring the conditions in the upstream channel as well as removing the concrete from the pipe to restore the original flow path.			
FT00051.010	No	The structure was unable to be accessed due to the slope and excessive vegetation.			
FTEH00074	No	Portions of the wing wall and channel appear to be compromised and are causing sediment and debris to accumulate in the mouth of pipe. Recommend restoring these components to maintain the flow path.			
FTEH00075	No	Portions of the concrete apron are cracked; but, it does not appear to impact flow. Recommend continuing to monitor the condition of the pipe and repair as needed if cracking gets worse.			
FTEH00104	Yes	Roadside debris observed in the channel. Recommend removing roadside debris as needed to restore original flow path.			
FTEH00107	No	Excessive dumping observed around the structure and channel, but it does not currently obstruct flow. Recommend removing debris from the drainage channel to maintain the flow path.			
FTEH00109	Yes	Roadside debris observed in the channel. Recommend removing debris to maintain the original flow path.			
FTEH00110	No	Areas of cracking concrete were observed along the wing walls. Recommend removing trash from the channel and continue to monitor cracking on wing walls.			
FTEH00133.1	No	The structure appears to be functioning properly. No other recommendations at this time.			
FTEH00133.1	No	Debris was observed as accumulating at the end of the drainage channel. Recommend removing debris that has accumulated to prevent potential blockages.			
Baltimore Harbor Tunnel (I-895)					
HT00001.010	No	The wing wall is completely disconnected from the pipe and lays in the channel. Recommend removing the components from the channel and restoring the structure to the original condition.			
HT00042.010	No	A chunk of concrete was observed in the mouth of the pipe and the concrete in the downstream channel is deteriorating. Recommend removing any additional concrete from the mouth of pipe before flow is impacted and repair the concrete channel as needed.			
HT00042.013	No	Debris observed in channel. Recommend removing vegetation, debris, and sand/stone to restore the original flow path.			
HT00055.014	Yes	The structure appears to be functioning properly. Recommend repairing the hole in the fence at the rear of Riverside Park.			
HT00058.010	No	The structure was unable to be accessed due to the fence and excessive slope/vegetation.			
HT00062.010	No	The structure was unable to be accessed due to the fence and excessive slope/vegetation.			
HT00062.011	No	The structure was unable to be accessed due to it being located behind a fence. The actual location is visible, but the structure cannot be clearly viewed from outside of the fenced area.			
HT00065.010	No	The structure was unable to be accessed due to the excessive vegetation on the slope and the fence located along the railroad tracks.			
HT00066.010	No	The structure was unable to be accessed due to the excessive vegetation on the slope and the fence located along the railroad tracks.			
HT00079.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
HT00080.010	Yes	The structure appears to be functioning properly. Recommend monitoring the areas of erosion along the banks and repair as needed.			
HT00080.022	No	The structure appears to be functioning properly. Recommend removing vegetation to maintain flow path.			
HT00086.013	No	The structure was unable to be located due to vegetation. The structure may potentially be submerged.			
HT00096.010	No	The structure was unable to be accessed due to it being located within the fenced area at the MPA storage yard.			
HT00117.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
HT00118.010	No	The pipe is disconnected and is currently laying in the channel. The flow can still exit the pipe but it is creating erosion issues due to the missing pipe sections. Recommend repairing the structure to restore the original condition and flow path.			
HT00123.010	No	The structure appears to be functioning properly. Recommend removing vegetation to maintain flow path.			
HT00123.011	No	The structure was unable to be located. No structure was observed in this area.			
HT00123.011	No	The structure was unable to be located. No structure was observed in this area.			
HT00131.010	No	Corrosion was observed on the bottom section of the pipe and debris was observed in the flow path. Recommend removing debris from the flow path, continuing to monitor the condition of the pipe, and repairing the pipe as necessary in order to maintain the flow path.			

Outfall Number	Dry Flow Observed? (Yes or No)	Comments			
		Flow	Flowing with Issues	Structural Concerns or Maintenance Required	No Access
Baltimore Harbor Tunnel (I-895) continued					
HT00132.010	No	The pipe was observed as being crushed and deteriorated. The flow appears to still be able to pass but may be impacted soon if the structure continues to worsen and is not repaired. Recommend repairing the structure to restore the original condition.			
HT00133.010	No	The structure was unable to be accessed due to it being located within the fenced area at the MPA storage yard.			
HT00140.010	No	The structure was unable to be located. No structure was observed in this area.			
HT00140.010	No	The structure was unable to be located. No structure was observed in this area.			
HTEH00012	No	The structure was unable to be accessed due to it being located within a fenced area. Excessive vegetation appears to be obscuring the location of the structure.			
HTEH00027	No	The structure is located in a locked fenced area. Therefore, the inspection was performed from outside of the fenced area. The structure appears to be functioning properly. No other recommendations at this time.			
HTEH00029	No	The structure appears to be functioning properly. Recommend removing vegetation to maintain flow path.			
HTEH00033	No	The structure was unable to be located due to excessive vegetation and may potentially be submerged in the swamp area.			
HTEH00042	No	An accumulation of sediment, woody debris, and a tree stump were observed in the channel. Recommend removing debris from the mouth of the pipe to restore the original flow path.			
HTEH00054	No	Sediment and stone material has accumulated in the channel and starting to bury the bottom of the pipe. Recommend removing sediment, rock material, and vegetation from the channel to restore the original flow path.			
HTEH00056	No	The structure appears to be functioning properly. No other recommendations at this time.			
HTEH00173	No	Portions of the concrete drainage channel appear to be deteriorating. Recommend repairing the damaged areas before the erosion begins to worsen and expand.			
HTEH00222	No	The inspection was performed from the top of the head wall due to issues accessing the front of the pipe. However, the structure appears to be functioning properly. No other recommendations at this time.			
HTEH00294	No	Sediment and roadside debris was observed as accumulating at the mouth of the pipe. Recommend removing sediment and debris to maintain flow path.			
Intercounty Connector (ICC) / MD 200					
IC0007.010	No	Roadside debris is getting trapped in the vegetation growing in channel. Recommend removing debris and excessive vegetation from channel before it impacts flow paths.			
IC0027.010	No	The structure was unable to be accessed due to it being located behind a fence. No gate was found in the area to access the structure.			
IC0030.010	No	The structure was unable to be located due to excessive vegetation.			
IC0049.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0055.010	No	Sediment and leaves were observed as beginning to accumulate in the channel. A battery was observed on the headwall. Recommend removing the battery, continuing to monitor the condition of the channel, and repair as necessary to maintain the flow path.			
IC0060.010	No	Small cracks were observed in the wall near the top of the pipe. Recommend to continue maintaining vegetation and monitor the sections of cracking concrete.			
IC0064.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0066.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0067.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0073.010	No	The structure appears to be functioning properly. Recommend monitoring vegetation and removing it from the channel before it impacts flow paths.			
IC0084.010	No	The structure is located behind a fence. However, a large tree/branch has fallen on the fence near the gate, resulting in the tree bending the fence and making the gate unable to be opened. Recommend removing the tree and restoring the gate access.			
IC0087.010	No	The structure was unable to be inspected due to excessive vegetation and the structure being located behind the fence.			
IC0097.010	No	The structure appears to be functioning properly. Recommend removing vegetation in the channel to maintain the original flow path.			
IC0099.010	No	The structure location was very difficult to access due to vegetation and access point. However, the structure appears to be functioning properly. Recommend addressing vegetation to improve access to the structure.			
IC0101.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0103.010	No	The vegetation is becoming excessive and beginning to grow over the headwall. Recommend continuing to maintain the vegetation to prevent it from blocking the flow path and improve access to the structure.			

Outfall Number	Dry Flow Observed? (Yes or No)	Comments			
		Flow	Flowing with Issues	Structural Concerns or Maintenance Required	No Access
Intercounty Connector (ICC) / MD 200 continued					
IC0104.010	No	The structure location is difficult to access. Significant roadside debris was observed accumulating in the channel and vegetation was growing over the headwall. But, the structure appeared to be functioning properly. Recommend removing vegetation and debris as			
IC0108.010	Yes	Sediment and debris was observed accumulating in the channel, but it does not appear to be blocking flow. Recommend removing sediment and debris from channel to restore flow path.			
IC0113.010	No	Minimal debris was observed as being lodged in the rip-rap but it doesn't appear to be currently impacting flow. Recommend removing debris and vegetation from the channel to maintain the flow path.			
IC0115.010	No	The structure appears to be functioning properly. Recommend removing vegetation that is encroaching on the channel.			
IC0119.010	No	The vegetation along the edge of the pond partially obscures the structure but does not appear to currently be impacting the flow path. Recommend removing the vegetation to maintain the original flow path.			
IC0121.010	No	The structure appears to be functioning properly. Recommend removing vegetation to maintain flow path.			
IC0123.010	No	Water was backed up into pond but no flow was observed. The structure appears to be functioning properly. Recommend removing vegetation to maintain flow path.			
IC0125.010	No	Debris observed in the channel. Recommend removing debris to maintain the original flow path.			
IC0128.010	No	Vegetation and debris is accumulating in the channel but does not appear to be impacting flow. Recommend continuing to monitor and address as needed to maintain the flow path.			
IC0137.010	No	The structure appears to be functioning properly. Recommend removing vegetation from channel to maintain flow path.			
IC0138.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0140.010	No	The structure appears to be functioning properly. Recommend removing vegetation to maintain flow path.			
IC0141.010	No	Debris was observed as accumulating in the channel but does not appear to currently be impacting flow. Recommend removing the debris to maintain the flow path.			
IC0146.010	No	The vegetation is becoming excessive and starting to grow into the channel. Recommend removing the debris and vegetation to maintain the flow path.			
IC0148.010	Yes	Cracking was observed in the wall around the top of the pipe but the structure appears to be functioning properly. Recommend continuing to monitor the cracking in the wall and repair as needed.			
IC0149.010	Yes	Cracking was observed in the wall around the top of the pipe but the structure appears to be functioning properly. Recommend continuing to monitor the cracking in the wall and repair as needed.			
IC0152.010	No	There were small cracks forming in the head wall but the structure appears to still be functioning properly. Recommend continuing to monitor the cracking and repair as needed.			
IC0158.010	Yes	Two outfalls were observed in the wall. Flow was only observed in the right pipe. Overall, the structure appears to be functioning properly. No other recommendations at this time.			
IC0159.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0160.010	No	The structure was unable to be located. The structure appears to be located behind the noise wall, but the MDTA key wouldn't open the locked door.			
IC0174.010	No	The structure appears to be functioning properly. Recommend removing excess vegetation and debris and continue to monitor areas of erosion.			
IC0175.010	No	Areas of erosion observed around the structure, but appears to be functioning properly. Recommend removing vegetation from channel to maintain flow path and continue to monitor areas of erosion.			
IC0185.010	No	The structure was unable to be located due to being completely submerged along the edge of the pond.			
IC0189.010	No	The structure appears to be submerged and was unable to be located.			
IC0190.008	No	The structure is visible but located behind a fence. The inspector was unable to find an access point in the fence to perform the inspection.			
IC0190.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0191.010	No	The structure appears to be functioning properly as part of the SWM pond system. No other recommendations at this time.			
IC0205.010	Yes	There is audible flow in the pipe from the pond. However, there is very little flow exiting the pipe. The structure appears to be functioning properly. No other recommendations at this time.			
IC0211.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0230.010	No	The structure has ponded water backed up into the pipe due to the location of the structure along the edge of the pond. However, the structure appears to be functioning properly. No other recommendations at this time.			

Outfall Number	Dry Flow Observed? (Yes or No)	Comments			
		Flow	Flowing with Issues	Structural Concerns or Maintenance Required	No Access
Intercounty Connector (ICC) / MD 200 continued					
IC0232.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0234.010	No	Vegetation was observed growing in the mouth of the pipe and channel, but the structure appears to be functioning properly. Recommend removing vegetation to maintain the flow path.			
IC0239.010	No	The structure was unable to be located due to excessive vegetation around the pond. The structure may potentially be submerged.			
IC0242.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC0264.010	No	The structure appears to be functioning properly. Recommend removing the debris and excess vegetation from the channel before flow is impacted.			
IC0279.010	No	The structure was unable to be located due to excessive vegetation and steep slopes.			
IC0280.010	No	The structure appears to be functioning properly. Recommend removing vegetation to maintain flow path.			
IC0282.010	No	The structure was unable to be located due to excessive vegetation around the pond.			
IC0290.010	No	The structure was unable to be located due to excessive vegetation and the existing fence.			
IC0296.010	Yes	The structure appears to be functioning properly. No other recommendations at this time.			
IC0299.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC1	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC2	Yes	The structure appears to be functioning properly. No other recommendations at this time.			
IC3	No	Small amount of wet muck was observed in mouth of pipe with minimal standing water. Recommend removing vegetation and muck to maintain flow path.			
IC4	Yes	The structure appears to be functioning properly. No other recommendations at this time.			
IC5	No	The structure appears to be functioning properly. No other recommendations at this time.			
IC6	Yes	The structure appears to be functioning properly. No other recommendations at this time.			
ICEH00156	No	The structure appears to be functioning properly. No other recommendations at this time.			
ICEH00300	No	The structure appears to be functioning properly. Recommend removing vegetation to maintain flow path.			
ICEH00391	No	Minimal cracking was observed in the concrete head wall. Recommend continuing to monitor the minor cracking and repair as needed.			
Francis Scott Key Bridge (I-695)					
KB00003.010	No	The structure appeared to be partially buried in sediment. Recommend removing sediment, vegetation, and debris from pipe and channel to restore flow path.			
KB00007.012	No	The structure appears to be buried. Recommend clearing debris from the drainage channel to expose structure and restore flow path.			
KB00008.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
KB00008.012	No	The structure appears to be functioning properly. Recommend removing excess vegetation.			
KB00013.010	No	The structure was unable to be accessed due to the road closures associated with the Key Bridge.			
KB00014.010	No	The structure was unable to be accessed due to the road closures associated with the Key Bridge.			
KB00017.010	No	The structure was unable to be located due to heavy vegetation obscuring the ground surface. The structure may potentially be buried.			
KB00018.010	No	Vegetation is growing over the structure and obscuring the location. Recommend removing sediment and vegetation from the pipe to restore flow path.			
KB00031.010	No	Areas of rip-rap in channel appear to have been disturbed. Recommend continuing to monitor rip-rap section in downstream channel and repair as necessary.			

Outfall Number	Dry Flow Observed? (Yes or No)	Comments			
		Flow	Flowing with Issues	Structural Concerns or Maintenance Required	No Access
Francis Scott Key Bridge (I-695) continued					
KB00040.010	No	Sediment and stone material was observed in the mouth of the pipe and drainage channel. Recommend removing sediment and stone material from the pipe to restore the original flow path.			
KB00041.010	No	The structure appears to be functioning properly. No other recommendations at this time.			
KBEH00012	No	The structure was unable to be accessed from Hawkins Point Rd due to excessive vegetation and the existing fenceline. The structure was also unable to be accessed from 695 due to ongoing roadway construction and the Key Bridge road closures.			
KBEH00012	No	The structure appears to be functioning properly. No other recommendations at this time.			
KBEH00027	No	The structure was unable to be located and may potentially be buried.			
KBEH00056	No	The structure was unable to be located due to excessive vegetation and sediment accumulation. The structure may potentially be buried.			

Appendix D: MCM No. 4 - Construction Site Stormwater Runoff Control Supporting Documentation

Appendix D.1 - Active Construction Projects and Disturbed Areas

Appendix D.1: Active Construction Projects and Disturbed Areas During FY23 and FY24

Construction Project Number	Project Name	Erosion and Sediment Control (ESC) / Grading Permit No.	LOD (acres)
13-DI-HT-005	I-895 SB MM 8.5 Drainage Repair and Maintenance	18-SF-0182	0.57
16-DI-KH-002	I-95 NB MP 93.9 PI1221 24" Pipe Deterioration + Slope Erosion Remediation	18-SF-0012	0.33
18-DI-HT-003	I-895 SB MP 4.50 Channel Erosion Repair	19-SF-0074	0.78
19-LO-KB-001	I-695 WB MM 47.3 Step Slope	20-SF-0055	1.54
20-DI-KB-002	I-695 Median MP 0.85 Pipe Deterioration Guardrail Post Through	22-SF-0033	0.83
20-FACL-HT-001	Moravia Salt Barn	21-SF-0036	0.53
21-DI-KH-003	I-95 NB Noise Barrier No. B X645W - Sinkholes along Front/Back of Alignment - Baltimore County	22-SF-0100	0.44
BB-2757-0000R	Replace 5KV and Add Redundancy	19-SF-0138	1.56
BB-3008	BB Crossover Automated Lane Closures	19-SF-0133	5.66
BB-3014	All Electronic Tolling Conversion US 50/301	20-SF-0027	12.05
BB-3017	William Preston Lane Jr. Memorial Bridge SWM Work for EB Bay Bridge Rehabilitation Phase-1 Package A	18-SF-0075	0.48
FT-3019	Ft. McHenry Tunnel - AET Conversion	20-SF-0058	3.27
HB-2594-000-007	(HB) Hatem Toll Plaza Pavement Rehabilitation and All-Electronic Tolling	12-SF-0324	4.18
HT-0694-000-006	I-895 Bridge Replacement	15-SF-0145	26.83
HT-2709	Envelope and Switch Gear Replacements at BHT Vent Buildings	20-SF-0177	1.14
HT-3012	I-895 TMDL Stream Restoration	18-SF-0102	4.12
KB-2708	FSK All Electronic Tolling	14-SF-0047	10.66
KB-3005	I-695 Repairs and Subgrade Rehabilitation on Sparrows Point near Bear Creek	21-SF-0113	4.91
KB-3013	Police Training Facility Site Development	21-SF-0029	6.85
KH-3009	I-95 NB Two-Lane ETL Extension to MD 152	18-SF-0098	111.5
KH-3010	I-95 NB Auxiliary Lane MD 152 to MD 24 and MD 24 / MD 924 Ramps	18-SF-0070	23.18
KH-3014	ETL200 NB - I-95 SB Noise Wall	19-SF-0128	2.26
KH-3019	MD 152 Interchange	19-SF-0187	102.32
KH-3020	ETL200 NB – MD-24 to Bynum Run – Lumen Utilities	22-SF-0134	1
KH-3022	Clayton Road Overpass Reconstruction	19-SF-0204	2.91
KH-3023	MD 24 and MD 924 Park and Ride	19-SF-0125	8.17
KH-3024	I-95 at Belvidere Road Interchange	20-SF-0102	42.45
KH-3029	Abingdon Road Overpass	19-SF-0212	1.30
KH-3030	Noise Wall on SB I-95 at MD 24 / Woodsdale	20-SF-0111	5.69
KH-3031	Noise Wall on SB I-95 South of Calvary Road	20-SF-0170	4.8
KH-3038	Eccelston Mitigation	21-SF-0044	54.16
KH-3040	MD 24 NB toward Singer Road	21-SF-0025	16.1
KH-3041	Interim High Speed AET Conversion Toll Plaza Demolition	21-SF-0051	3.56

Appendix D.1: Active Construction Projects and Disturbed Areas During FY23 and FY24

MA-3004	TMDL - Enhancement of Pre-2000 BMP's and SWM Retrofits, Phase 2 SWM Retrofit Bay Bridge	16-SF-0088	1.57
MA-3015	Small Drainage Rehabilitation	19-SF-0012	3.41
MA-3018	Drainage Outfall Rehabilitation	20-SF-0181	5.43
MR-3019	ICC East - Facility Underdrainage Repairs - Water Line Relocation and DEF Tank	20-SF-0124	0.18
NB-0543	Harry W. Nice/Thomas “Mac” Middleton Bridge Replacement	18-SF-0030	6.64
NB-3003	Nice-Middleton Bridge-Campus Improvement Project	19-SF-0088	11.41
TO-2030-1951-R1	I-895 Bridge SB at Herring Run - Scour Remediation	20-SF-0152	0.61
		Total:	**495.38**

Appendix D.2 - RPC List

MDE Responsible Personnel Certification		
Employee	**Certification Number**	**Date Issued**
Rey Magsino	RPC002997	6/18/2015
Gary Hill	RPC002725	5/19/2015
Gregory Seman	RPC002788	5/26/2015
David Horton	RPC002920	6/9/2015
George Winfield	RPC002948	6/12/2015
Anthony Tabasco	RPC002975	6/16/2015
Edgar Cisnero	RPC002994	6/18/2015
Charles Schmidt	RPC003036	6/23/2015
Kenneth Hadel	RPC003041	6/23/2015
William Schneider	RPC003219	7/27/2015
Roy Sterrett	RPC013426	6/13/2018
Marc Lehner	RPC027877	9/1/2023
Rebecca Urik	RPC002939	6/11/2015
Alfred Korpisz	RPC002943	6/12/2015
Charles Marcum	RPC006473	7/7/2016
William Grove	RPC006538	7/15/2016
Jeffrey Holmes	RPC006760	8/11/2016
Raymond Shue	RPC009170	2/8/2017
Saber Forsythe	RPC007294	9/29/2016
Robert Cather	RPC007293	9/29/2016
Carl Brockington	RPC007941	11/25/2016
Benjamin Dunston	RPC009439	3/6/2017
Ryan Bandy	RPC012818	4/2/2018
BreAnna Herring	RPC013334	6/4/2018
Richard Holthaus	RPC013494	6/21/2018
Thomas Fountain	RPC014286	9/28/2018
Christopher Stumpf	RPC023690	8/18/2021

Appendix E: MCM No. 5 - Post Construction Stormwater Management Supporting Documentation

Appendix E.1 - Stormwater BMP Maintenance Manual

Stormwater Best Management Practices (BMP) Maintenance Manual

William Preston Lane Jr. Bay Bridge (LB) Facility

Anne Arundel County, Queen Anne's County

Version 2.0

June 2024

Prepared By:

Maryland Transportation Authority

Engineering Division
Baltimore, Maryland

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1. Introduction

This Facility Maintenance Manual documents the stormwater Best Management Practices (BMPs) affiliated with William Preston Lane Jr. Bay Bridge (LB) facility and related roadways. This manual includes BMP inventory, location maps and site photos to locate and identify the BMPs. The manual also has maintenance work order forms. A key reference to this facility manual is MDTA's BMP Maintenance Guidance Manual, which serves as a reference tool for maintenance staff to understand and maintain BMPs.

The following pages provide a general overview of the groups of BMPs within MDTA's inventory. Understanding the basic function and key components of a BMP is important to ensuring proper maintenance is performed.

2. Stormwater BMPs Inventory

The William Preston Lane Jr. Memorial Bridge crosses the Chesapeake Bay along US-50/US-301. The east span opened in July 1952, and the west span opened in June of 1973. Both spans are about 4.3 miles long and connect recreational and ocean regions located on Maryland's Eastern Shore and the metropolitan areas of Baltimore, Annapolis and Washington, D.C. Associated with this bridge are a toll plaza (tolls are only collected in the eastbound direction), an administration building/ maintenance shop, a police/maintenance building, a truck inspection post, and a salt dome.

3. Stormwater BMP Maintenance

The BMP Maintenance Guidance Manual details procedures to follow to perform routine and cyclical maintenance activities. Routine maintenance consists of the annual activities to properly maintain the performance and overall stability of a BMP. Cyclical maintenance involves actions that are performed less frequently than routine maintenance. These actions may focus on specific BMP components and may be performed by MDTA's maintenance staff or may require specific contractors. Activities may involve, but are not limited to, vegetation maintenance, site stabilization, trash removal, structure maintenance, sediment / debris removal, drainage repair, landscaping and invasive species control.

Maintenance activities vary based upon the BMP types (which dictate the general mechanisms by which a BMP provides stormwater management) and subtypes (which describe the specific mechanisms). The BMP subtypes are further sorted into BMP groups, to simplify the identification of issues, and BMP maintenance categories, which classify maintenance needs and the resulting work order forms. Table 3-1 provides a breakdown of type, subtype, group, and maintenance category.

Table 3-1 BMP Maintenance Categories

BMP Type	BMP Subtype	BMP Group	BMP Maintenance Category
Filtering	Biofiltration	Bioretention	Small Scale/ Linear
Filtering	Bioretention	Bioretention	Small Scale/ Linear
Filtering	Micro Bioretention	Bioretention	Small Scale/ Linear
Filtering	Rain Garden	Bioretention	Small Scale/ Linear
Filtering	Bioswale	Bio-Swale	Small Scale/ Linear
Filtering	Modified Bio-Swale	Bio-Swale	Small Scale/ Linear
Filtering	Submerged Gravel Wetland	Submerged Gravel Wetland	Small Scale/ Linear
Filtering	Linear sand filter	Linear Filtration / Infiltration Trench	Small Scale/ Linear
Filtering	Perimeter sand filter	Perimeter sand filter	Small Scale/ Linear
Filtering	Surface sand filter	Surface sand filter	Small Scale/ Linear
Filtering	Underground Stormfilter	Underground Qualitative Treatment	Other
Hydrodynamic Structures	Underground water quality pretreatment	Underground Qualitative Treatment	Other
Hydrodynamic Structures	Underground extended detention	Underground Quantitative Treatment	Other
Hydrodynamic Structures	Underground Storage	Underground Quantitative Treatment	Other
Infiltration	Infiltration basin	Infiltration basin	Pond/ Basin
Infiltration	Infiltration trench	Infiltration trench	Small Scale/ Linear

BMP Type	BMP Subtype	BMP Group	BMP Maintenance Category
Infiltration	Recharge trench-ICC	Linear Filtration / Infiltration Trench	Small Scale/ Linear
Infiltration	Permeable Paving	Permeable Pavement Area	Other
Infiltration	Porous pavers	Permeable Pavement Area	Other
Infiltration	Underground infiltration trench	Underground Qualitative Treatment	Other
Open Channel System	Dry swale	Open Channel System	Small Scale/ Linear
Open Channel System	Grass Channel	Open Channel System	Small Scale/ Linear
Open Channel System	Grass Swale	Open Channel System	Small Scale/ Linear
Open Channel System	Modified Grass Swale	Open Channel System	Small Scale/ Linear
Pond	Dry extended detention pond	Dry Pond	Pond/ Basin
Pond	Dry pond	Dry Pond	Pond/ Basin
Pond	Sand storage pond	Sand storage pond	Pond/ Basin
Pond	Micropool extended detention pond	Wet Pond	Pond/ Basin
Pond	Pocket pond	Wet Pond	Pond/ Basin
Pond	Wet extended detention pond	Wet Pond	Pond/ Basin
Pond	Wet pond	Wet Pond	Pond/ Basin

4. BMP Groups

The following pages provide a general overview of the groups of BMPs within MDTA's inventory. These groups have been created to simplify the process of identifying issues in need of remediation. Understanding the basic function and key components of a BMP is important to ensuring proper maintenance is performed.

Bioretention



These BMPs are landscaped areas that provide temporary surface storage above a filter bed of planting soil and / or other MDE-approved filter media. Features include a riser or weir, an underdrain, an outfall pipe / riprap, and an embankment. Common maintenance issues include accumulation of sediment, clogging of the filter media, and dead / diseased vegetation. Bioretention BMPs are categorized as Small Scale / Linear for the purposes of BMP Maintenance Categories.

The BMP subtypes within this group include:

- Biofiltration
- Bioretention
- Micro-Bioretention
- Rain Garden

Bio-Swale



These BMPs are landscaped channels with check dams that provide temporary surface storage above a filter bed of planting soil and / or other MDE-approved filter media. Features include an underdrain and an inlet structure at the downstream end of the channel. Common maintenance issues include accumulation of sediment, clogging of the filter media, dead / diseased vegetation, and scour of the channel bottom. Bio-Swale BMPs are categorized as Small Scale / Linear for the purposes of BMP Maintenance Categories.

The BMP subtypes within this group include:

- Bioswale
- Modified Bio-Swale

Submerged Gravel Wetland



These BMPs are small-scale filters that provide water quality treatment above a filter bed of wetland plants and / or other MDE-approved filter media. These BMPs are found in areas where a high groundwater table is present or in areas with poorly draining soils. Features include a maintenance access road, forebay, inflow pipe and riprap, stone or gabion basket weir, observation well, cleanout, perforated and solid subdrain pipe, outlet structure, and outlet pipe. Common maintenance issues include accumulation of sediment, clogging in the gravel media or subdrain pipes, dead / diseased vegetation, and clogging and/or erosion at inflow and outflow structures. Submerged Gravel Wetland BMPs are categorized as Small Scale / Linear for the purposes of BMP Maintenance Categories.

The BMP subtypes within this group include:

- Submerged Gravel Wetland

Linear Filtration / Infiltration Trench



These BMPs are grassy channels atop a layer of sand media. If the trench has an underdrain connected to an outfall pipe, it is considered an infiltration trench. If there is no underdrain and runoff infiltrates into the soil below the media, it is a recharge trench. Features include a gravel bed topped with a filter layer of pea gravel. Common maintenance issues include clogging of the filter bed and scour of the channel bottom. Linear Filtration / Infiltration Trench BMPs are categorized as Small Scale / Linear for the purposes of BMP Maintenance Categories.

The BMP subtypes within this group include:

- Linear Sand Filter

- Recharge Trench (ICC only)

Perimeter Sand Filter



These BMPs are underground chambers that contain a sedimentation chamber and a sand filter. Features include access grates, a weir separating the sedimentation chamber from the sand filter, and an underdrain for the sand filter that connects to the outfall pipe. Common maintenance issues include blockage of the access grates, clogging of the sand filter media, and accumulation of trash within the underground chamber. Perimeter Sand Filter BMPs are categorized as Small Scale / Linear for the purposes of BMP Maintenance Categories.

Surface Sand Filter



These BMPs are small basins that provide temporary storage above a sand filter bed. Features include a pretreatment area for larger sediments and an underdrain system beneath the sand filter bed. Common maintenance issues include accumulation of sediment and clogging of the filter media. Surface Sand Filter BMPs are categorized as Small Scale / Linear for the purposes of BMP Maintenance Categories.

Underground Qualitative Treatment



These BMPs are underground chambers that are supplied runoff through an inflow pipe and provide quantitative treatment by either infiltration or filtration. Features include an inflow pipe and filter / infiltration media chamber(s). If used as a pretreatment facility, the outfall pipe doubles as the inflow pipe for a downstream facility. Common maintenance issues include clogging of the filter / infiltration media and accumulation of trash within the underground chamber. Underground Qualitative Treatment BMPs are categorized as Other for the purposes of BMP Maintenance Categories.

The BMP subtypes within this group include:

- Underground Infiltration Trench
- Underground Storm Filter
- Underground Water Quality Pretreatment

Underground Quantitative Treatment



These BMPs are underground chambers / pipes that provide temporary storage of runoff. Features include an inflow pipe and an orifice designed to drain the chamber over a 12 – 24 hr. period. Common maintenance issues accumulation of trash within the underground chamber / pipe and clogging of the orifice. Underground Quantitative Treatment BMPs are categorized as Other for the purposes of BMP Maintenance Categories.

The BMP subtypes within this group include:

- Underground Extended Detention
- Underground Storage

Infiltration Basin



These BMPs are basins created by embankments that provide temporary surface storage for runoff. Stored water infiltrates out through the bottom of the facility. Features include pretreatment techniques to preserve the performance of the infiltration bed (grass channel, sand layer, etc.), an inflow pipe / channel, riprap, forebay, riser / weir, outfall pipe / riprap and embankment. Common maintenance issues include accumulation of sediment and clogging of the soil within the infiltration bed. Infiltration Basin BMPs are categorized as Pond / Basin for the purposes of BMP Maintenance Categories.

Infiltration Trench



These BMPs are channels with a gravel bed that encourages runoff to infiltrate below the surface. Features include a gravel bed topped with a filter layer of pea gravel. Clogging of the gravel layers is a common maintenance issue. Infiltration Trench BMPs are categorized as Small Scale / Linear for the purposes of BMP Maintenance Categories.

Permeable Pavement Area



These BMPs include any form of paved area that is designed to enable runoff to infiltrate into the soil below the pavements, effectively reducing the amount of impervious cover and giving the area runoff characteristics comparable to vegetated areas. They consist of a surface layer of either porous asphalt / concrete or permeable interlocking concrete pavers and a subsurface layer of either graded stone or sand. Common maintenance issues include clogging of the pores / the spaces between pavers and damage to the paved area due to vegetation growing in the openings in the pavements. Permeable Pavement Area BMPs are categorized as Other for the purposes of BMP Maintenance Categories.

The BMP subtypes within this group include:

- Permeable Paving
- Porous Pavers

Open Channel System



These BMPs are grass-lined channels in which infiltration occurs as water flows along the channel bottom. May feature a bed of permeable soil and an underdrain if natural soil conditions would not promote infiltration. Common maintenance issues include clogging of the permeable bed and scour of the channel bottom. Open Channel System BMPs are categorized as Small Scale / Linear for the purposes of BMP Maintenance Categories.

The BMP subtypes within this group include:

- Dry Swale
- Grass Channel
- Grass Swale
- Modified Grass Swale

Dry Pond



These BMPs are basins created by excavation and / or embankments to provide temporary surface storage for runoff. Stored water discharges through a low-flow orifice at a controlled rate over as long as a 48 hr. period. Features include inflow pipe / channel, riprap, forebay, low flow orifice / pipe, riser / weir, outfall pipe / riprap and embankments. Common maintenance issues include accumulation of sediment, clogging of the low-flow orifice, and ponding of water beyond the design period. Dry Pond BMPs are categorized as Pond / Basin for the purposes of BMP Maintenance Categories.

The BMP subtypes within this group include:

- Dry Extended Detention Pond
- Dry Pond

Wet Pond



These BMPs are basins created by excavation and / or embankments to house a permanent pool, which is fed by stormwater runoff. May have a low-flow orifice to provide temporary surface storage above the permanent pool. Features include inflow pipe / channel, riprap, forebay, rock window, low flow orifice / pipe, riser / weir, outfall pipe / riprap and embankment. Common maintenance issues include accumulation of sediment and clogging of the low-flow orifice. Wet Pond BMPs are categorized as Pond / Basin for the purposes of BMP Maintenance Categories.

The BMP subtypes within this group include:

- Extended Detention Shallow Wetland
- Micropool Extended Detention Pond
- Pocket Pond
- Wet Extended Detention Pond
- Wet Pond

Sand Storage Pond



These BMPs are basins created by excavation and / or embankments to provide temporary surface storage for runoff. Stored water drains from the facility through a sand filter bed that occupies past of the facility's bottom. Features include inflow pipe / channel, riprap, forebay, riser / weir, outfall pipe / riprap and embankments. Common maintenance issues include accumulation of sediment, clogging of the filter media, and ponding of water within the basin. Sand Storage Pond BMPs are categorized as Pond / Basin for the purposes of BMP Maintenance Categories.

5. BMP Maintenance Categories

As previously stated, BMP maintenance categories classify maintenance needs and the resulting work order forms used. The three categories are:

- Pond/ Basin
- Small Scale/ Linear
- Other

Those BMP groups covered by the Pond / Basin and the Small Scale / Linear categories have standardized lists of maintenance activities that generally apply to all BMPs within the category. These activities can be reviewed on the Maintenance Work Order Forms in Appendix A; they are also summarized below. Maintenance requirements for BMPs such as underground storage and permeable paving which fall under 'Other' categories are typically different from requirements for ponds or linear devices and do not also share all maintenance needs between each other. As a result, the BMP Maintenance Guidance Manual would be referred to on a case by case basis for these BMPs.

Pond / Basin

Preventative and annual maintenance activities for this category include mowing, trash and debris removal, and vegetation maintenance.

- Mowing should be conducted to provide access to any inflow, control, and outflow structures as well as along the side slopes for forebays and basins. Excess turf growth (greater than 6.0") within the basins should be trimmed. It is essential to not mow landscape plants.
- Trash and debris should be removed from forebays, impoundment areas, risers, and outfalls.
- For vegetation maintenance, any woody vegetation (volunteers) within the BMP and on adjacent side slopes should be removed. This is especially applicable to the BMP embankment. Woody vegetation should also be removed from near inflow, control, and outflow structures.

Repair and remediation activities that should be conducted as necessary include control of invasion or noxious vegetation, sediment removal, inflow stabilization, site stabilization, impoundment maintenance, control structure maintenance, and landscaping.

- Invasive vegetation within the BMP should be managed. Management of Phragmites specifically is a priority.
- If forebay or impoundment is heavily sedimented, remove sediment and debris, then stabilize disturbed areas.
- Stabilize discharge locations (e.g. riprap) as necessary at the outfall of inflow pipes, inflow channels, weir over-flows, and outfall. Stabilization methods typically include placement or redressing of stone or riprap.

- Eroded or exposed areas should be stabilized using 4-inch topsoil, seed, and mulch and then covered with Type A soil stabilization matting.
- Eroded and exposed areas within impoundments should be repaired. In the event of excessive ponding (such as if a BMP does not drain within its drawdown time), contact OEC Environmental Engineering.
- Defects within control structures should be repaired. These defects may include, but are not limited to, cracks, clogged low-flow pipes / openings, and pipe separations.
- Landscaping should be replaced or supplemented as necessary.

A typical schematic for BMPs within the Pond / Basin maintenance category has been included in Figure 5-1, while a maintenance activity schedule is presented in Table 5-1.

Figure 5-1 Schematic of Typical Pond/ Basin BMP

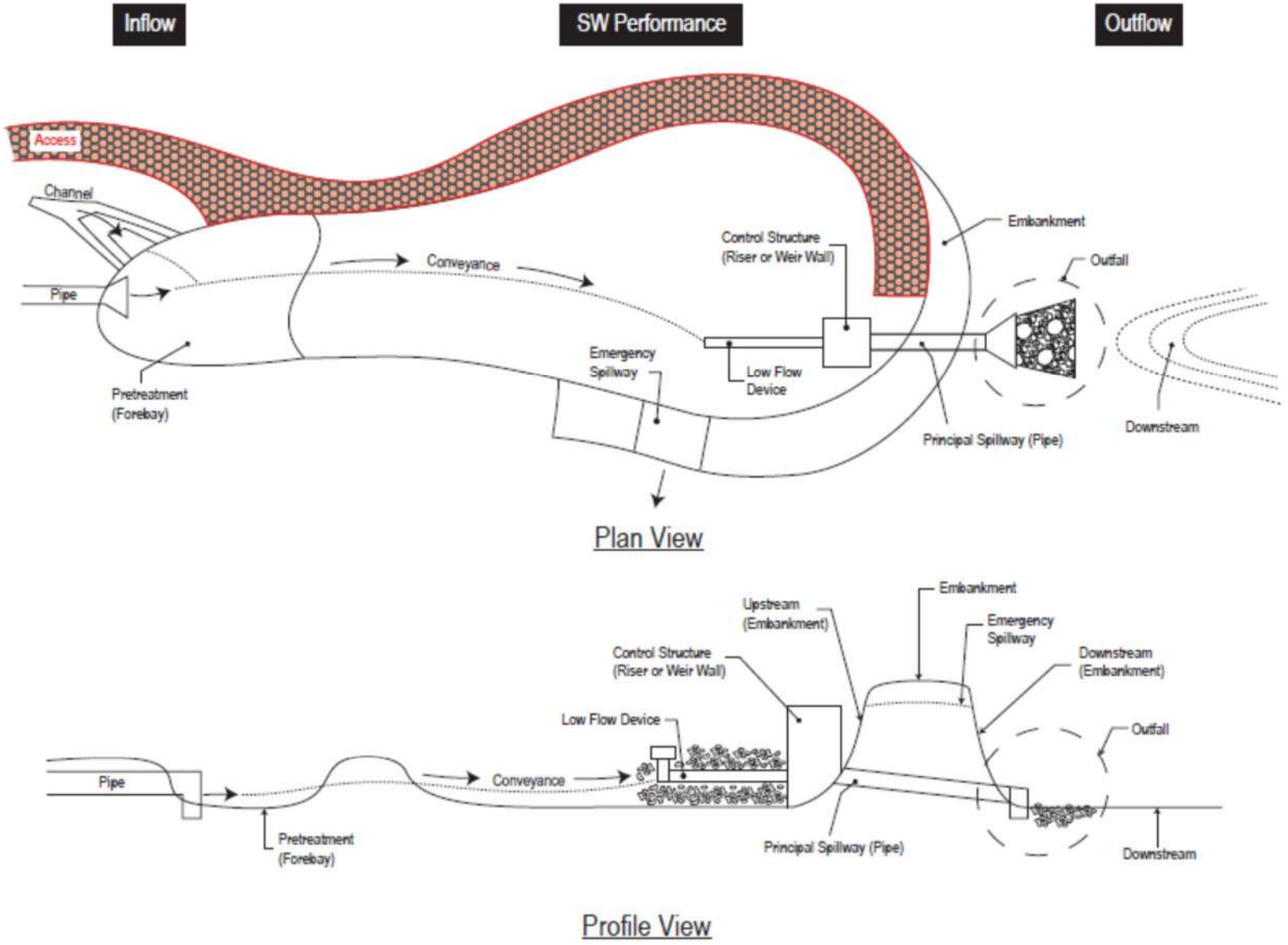


Table 5-1 Maintenance Activity Schedule for Ponds/ Basins

Action	Frequency	Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Inspection	1X per year or more	Check: pipe or ditch inflow, riser structure, riprap spillways, ponding depth, slope stability and other conditions			X									
Routine Inspection	4X during Spring/ Summer	Monitor within BMP: vegetative growth, invasive vegetation, sedimentation in forebay and basin, slope stability, erosion.				X		X		X		X		
Mowing	4X per year	Mow side slopes and embankment; trim excessive turf growth in basin				X		X		X		X		
Trash and Debris Removal	1X per year or more	Remove / dispose of accumulated trash and debris within and around site												
Vegetation Management	1X per year or more	Remove volunteered woody vegetation, especially along embankment												
Invasive Vegetative Control	1X per year or more	Manage invasive species. As-needed repair impoundment surface if disturbed.												
Sediment Removal	As-needed, at least every 5 years	Remove / dispose of accumulated sediment within forebay and/or impoundment												
Inflow Stabilization	As-needed	Stabilize discharge locations (outfalls, weirs, etc.)												
Site Stabilization	As-needed	Stabilize site area												
Impoundment Maintenance	As-needed	Repair eroded / exposed areas. Monitor for excessive ponding												
Control Structure Maintenance	As-needed	Repair defects to control structure (e.g., cracks, clogged low-flow pipes / openings, pipe separations)												
Landscaping	As-needed	Replace / Supplement landscaping												

Small Scale / Linear

Preventative and annual maintenance activities for this category include mowing, trash and debris removal, vegetation maintenance, and checking for standing water within observation wells.

- Mowing should be conducted on side slopes and around the perimeter of the BMP. Excess turf growth (greater than 6.0") within the BMP should be trimmed. It is essential to not mow landscape plants.
- Trash and debris should be removed from within and around the BMP.
- For vegetation maintenance, any woody vegetation (volunteers) within the BMP, on adjacent side slopes, and near inflow, control, or outflow structures should be removed.
- The observation wells should be checked for standing water. In the case of significant depth of water after 72 hours since the last significant rainfall, contact OEC Environmental Engineering.

Repair and remediation activities that should be conducted as necessary include control of invasion or noxious vegetation, sediment removal, inflow stabilization, site stabilization, impoundment maintenance, underdrain and outlet maintenance, and landscaping.

- Invasive vegetation within the BMP should be managed. Management of Phragmites specifically is a priority.
- If forebay or impoundment is heavily sedimented, remove sediment and debris, then stabilize disturbed areas.
- Stabilize discharge locations (e.g. riprap) as necessary at the outfall of inflow pipes, inflow channels, weir over-flows, and outfall. Areas adjacent to the roadway edge should also be stabilized. Stabilization methods typically include placement or redressing of stone or riprap.
- Eroded or exposed areas should be stabilized using 4-inch topsoil, seed, and mulch and then covered with Type A soil stabilization matting.
- Eroded and exposed areas within impoundments should be repaired. Surface media should be replaced as needed. In the event of excessive ponding (such as if a BMP does not drain within its drawdown time), contact OEC Environmental Engineering.
- Clogs within the underdrain network should be cleared. The outlet to the underdrain network should be stabilized as necessary.
- Landscaping should be replaced or supplemented as necessary.

A typical schematic for BMPs within the Small Scale / Linear maintenance category has been included in Figure 5-2, while a maintenance activity schedule is presented in Table 5-2. Additionally, a schematic for bioswale mowing has been included in Figure 5-3.

Figure 5-2 Schematic of Typical Small Scale/ Linear BMP

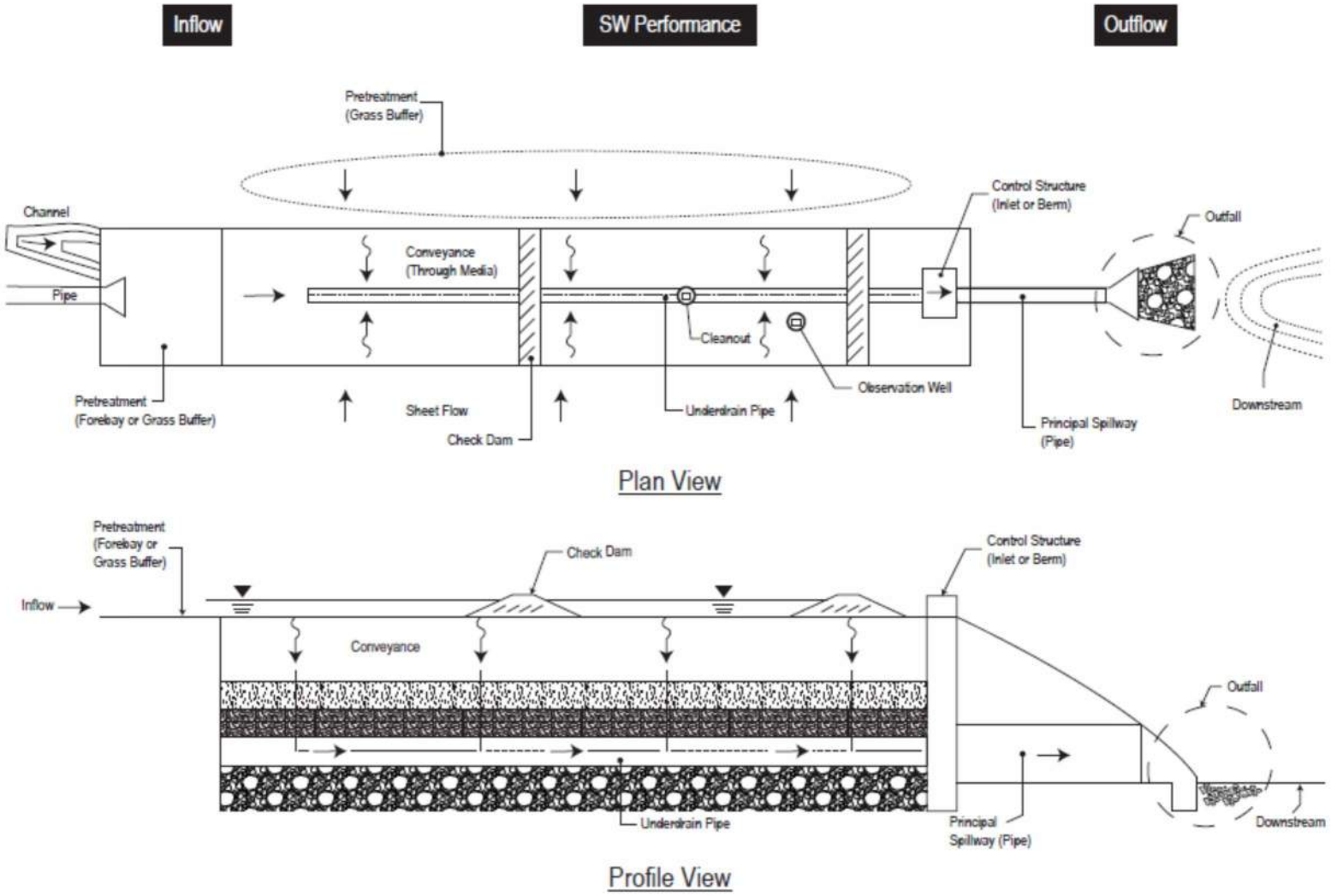


Table 5-2 Maintenance Activity Schedule for Small Scale/ Linear Practices

Action	Frequency	Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual Inspection	1X per year or more	Check: water-level in observation well, surface media, volunteer/ invasive vegetation, erosion/ sediment …			X									
Mowing	4X per year	Mow side slopes, perimeter area; trim excessive turf growth.				X		X		X		X		
Trash and Debris Removal	1X per year or more	Remove / dispose of accumulated trash and debris within and around site												
Vegetation Management	1X per year or more	Remove volunteered woody vegetation and excessive growth of other vegetation												
Invasive Vegetative Control	1X per year or more	Manage invasive species. As-needed, repair impoundment surface if disturbed.												
Sediment Removal	As-needed, at least every 5 years	Remove / dispose of accumulated sediment within impoundment area.												
Inflow Stabilization	As-needed	Stabilize discharge locations (outfalls, ditches, sheet flow, etc.)												
Site Stabilization	As-needed	Stabilize site area												
Impoundment Maintenance	As-needed	Repair eroded areas. Replace surface media as needed. Monitor for excessive Ponding. Repair damage to observation well, cleanouts…												
Underdrain / Outlet Maintenance	As-needed	Clear clogs within underdrain network, maintain stable outlet												
Landscaping	As-needed	Replace / Supplement landscaping												

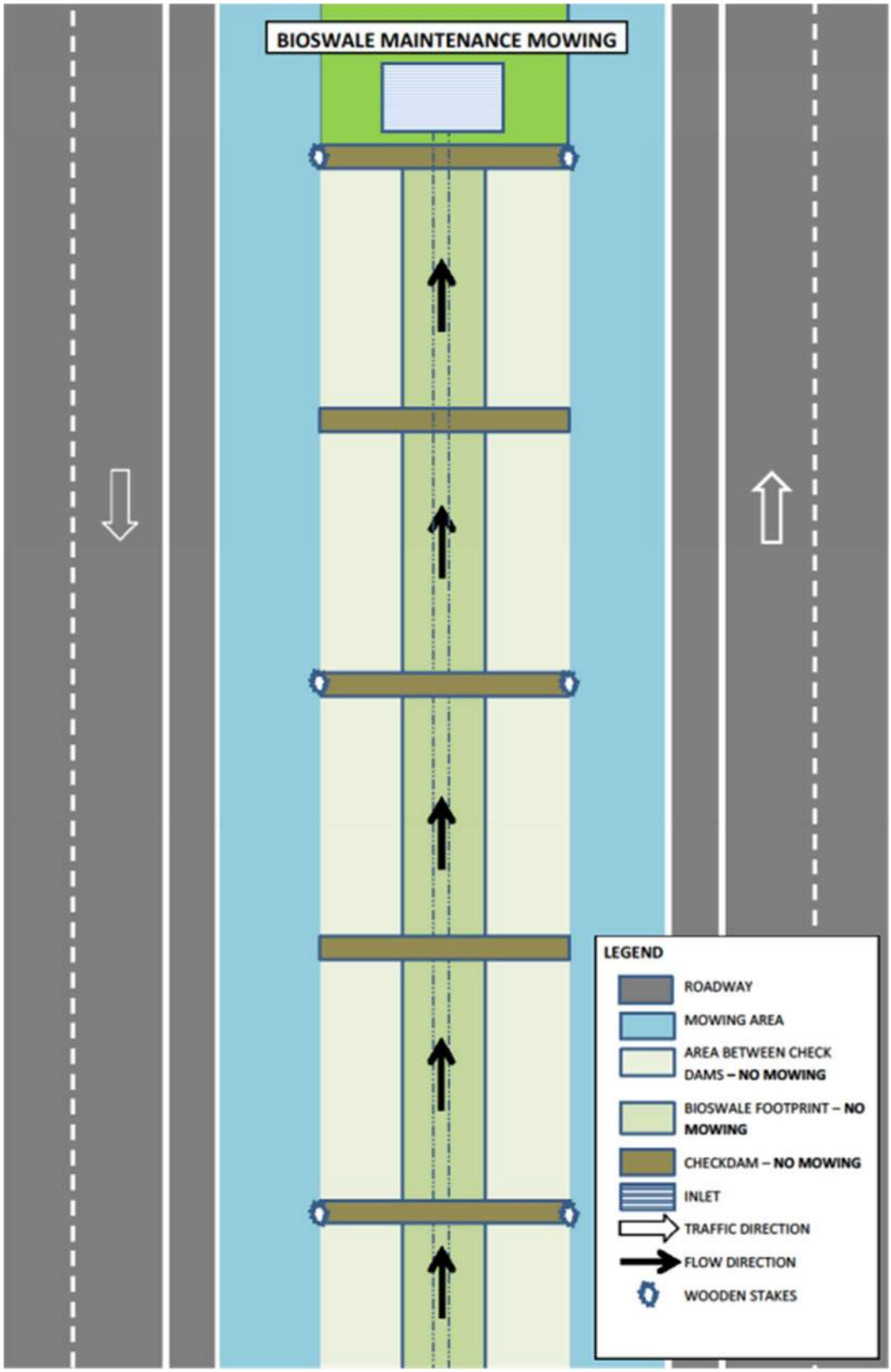


Figure 5-3 Schematic of Bioswale Maintenance Mowing

6. Stormwater BMP's Inventory

Table 6-1 summarizes the stormwater BMPs that this facility is responsible for maintaining. Figure 6-1 provides an overview of the existing BMP locations. Aerial vicinity and site maps of these BMPs, along with site photos, can be found in Appendix B. The BMP Maintenance Guidance Manual describes these BMPs and their components in detail.

Table 6-1 Stormwater BMPs - Overall Summary

BMP Group	Number of BMPs
Bioretention	1
Bio-Swale	0
Submerged Gravel Wetland	1
Linear Filtration / Infiltration Trench	2
Perimeter Sand Filter	0
Surface Sand Filter	0
Underground Qualitative Treatment	0
Underground Quantitative Treatment	0
Infiltration Trench	0
Infiltration Basin	0
Permeable Pavement Area	2
Open Channel System	10
Dry Pond	0
Wet Pond	1
Sand Storage Pond	0
SWM Credit	22
Total	**39**

Table 6-2 BMP Inventory by Group – Bioretention

No	BMP ID	Milepoint	Direction	BMP Type	BMP Subtype	Year Built	BMP Maintenance Category
1	LB0323F01	32.3	Facility	Filtering	Micro-Bioretention	2019	Small Scale/ Linear

Table 6-3 BMP Inventory by Group – Submerged Gravel Wetland

No	BMP ID	Milepoint	Direction	BMP Type	BMP Subtype	Year Built	BMP Maintenance Category
1	LB0319F03U	31.9	Facility	Filtering	Submerged Gravel Wetland	2020	Small Scale/ Linear

Table 6-4 BMP Inventory by Group – Linear Filtration / Infiltration Trench

No	BMP ID	Milepoint	Direction	BMP Type	BMP Subtype	Year Built	BMP Maintenance Category
1	LB0319F02	31.9	Facility	Filtering	Linear Sand Filter	1997	Small Scale/ Linear
2	LB0319F04	31.9	Facility	Filtering	Linear Sand Filter	1997	Small Scale/ Linear

Table 6-5 BMP Inventory by Group – Permeable Pavement Area

No	BMP ID	Milepoint	Direction	BMP Type	BMP Subtype	Year Built	BMP Maintenance Category
1	LB0320F01	32.0	Facility	Infiltration	Permeable Paving	2003	Other
2	LB0320F02	32.0	Facility	Infiltration	Permeable Paving	2003	Other

Table 6-6 BMP Inventory by Group – Open Channel System

No	BMP ID	Milepoint	Direction	BMP Type	BMP Subtype	Year Built	BMP Maintenance Category
1	LB0314E01	31.4	Eastbound	Open Channel System	Grass Swale	1989	Small Scale/ Linear
2	LB0316A01	31.6	Approach	Open Channel System	Grass Swale	1989	Small Scale/ Linear
3	LB0316A02	31.6	Approach	Open Channel System	Grass Swale	1989	Small Scale/ Linear
4	LB0317E01	31.7	Eastbound	Open Channel System	Grass Channel	2003	Small Scale/ Linear
5	LB0317E02	31.7	Eastbound	Open Channel System	Grass Channel	2003	Small Scale/ Linear

No	BMP ID	Milepoint	Direction	BMP Type	BMP Subtype	Year Built	BMP Maintenance Category
6	LB0318E01	31.8	Eastbound	Open Channel System	Grass Channel	2003	Small Scale/ Linear
7	LB0319E01	31.9	Eastbound	Open Channel System	Grass Channel	2003	Small Scale/ Linear
8	LB0319E02	31.9	Eastbound	Open Channel System	Grass Channel	2003	Small Scale/ Linear
9	LB0368E01	36.8	Eastbound	Open Channel System	Grass Swale	1989	Small Scale/ Linear
10	LB0369M01	36.9	Median	Open Channel System	Grass Swale	1989	Small Scale/ Linear

Table 6-7 BMP Inventory by Group – Wet Pond

No	BMP ID	Milepoint	Direction	BMP Type	BMP Subtype	Year Built	BMP Maintenance Category
1	LB0319F01U	31.9	Facility	Pond	Wet Pond	2020	Pond/ Basin

Table 6-8 BMP Inventory by Group – SWM Credit

No	BMP ID	Milepoint	Direction	BMP Type	BMP Subtype	Year Built	BMP Maintenance Category
1	LB0299E01	29.9	Eastbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
2	LB0299E02	29.9	Eastbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
3	LB0299E03	29.9	Eastbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
4	LB0299E04	29.9	Eastbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
5	LB0299E05	29.9	Eastbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
6	LB0299E06	29.9	Eastbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
7	LB0303W01	30.3	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
8	LB0303W02	30.3	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
9	LB0304W01	30.4	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
10	LB0304W02	30.4	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
11	LB0304W03	30.4	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
12	LB0304W04	30.4	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear
13	LB0304W05	30.4	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	Small Scale/ Linear

No	BMP ID	Milepoint	Direction	BMP Type	BMP Subtype	Year Built	BMP Maintenance Category
14	LB0304W06	30.4	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	
15	LB0307W01	30.7	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	
16	LB0307W02	30.7	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	
17	LB0307W03	30.7	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	
18	LB0307W04	30.7	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	
19	LB0307W05	30.7	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	
20	LB0307W06	30.7	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	
21	LB0307W07	30.7	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	
22	LB0307W08	30.7	Westbound	SWM Credit	Disconnection of Non-Rooftop Runoff Credit	2022	

Figure 6-1 LB BMPs Overview Map

)LJXUH :LOLDP 3UHVWRQ /DQH %ULGJH %03V 2YHUYLHZ 0DS

Maryland Transportation Authority

/HJHQG

%03 7\SH

- 3RQG %DVLQ
- 6PDOO 6FDOH /LHHDU
- 2WKHU
- &UHGLW

0'7$ 0LOH 0DUNHUV 0DUU

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Maryland Department of Transportation (MDOT), Maryland Transportation Authority (MDTA), MDOT MDTA Office of Engineering and Construction (OEC), MD iMAP, DoIT

7. References and Resources

The following are key resources available within MDTA:

- Stormwater Best Management Practices (BMP) Maintenance Guidance Manual
- Google Earth GIS Enterprise (MDTA's computer network)
- Stormwater Best Management Practices (BMP) Inspection Manual

Other relevant resources that are readily available are:

- U.S. Environmental Protection Agency (EPA) – BMP maintenance:

http://water.epa.gov/polwaste/npdes/swbmp/BMP-Inspection-and-Maintenance.cfm

- Maryland Department of Environment (MDE) – BMP design:

http://www.mde.maryland.gov/programs/Water/StormwaterManagementProgram/MarylandStormwaterDesignManual/Pages/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.aspx

APPENDICES

Appendix A - Maintenance Work Order Forms

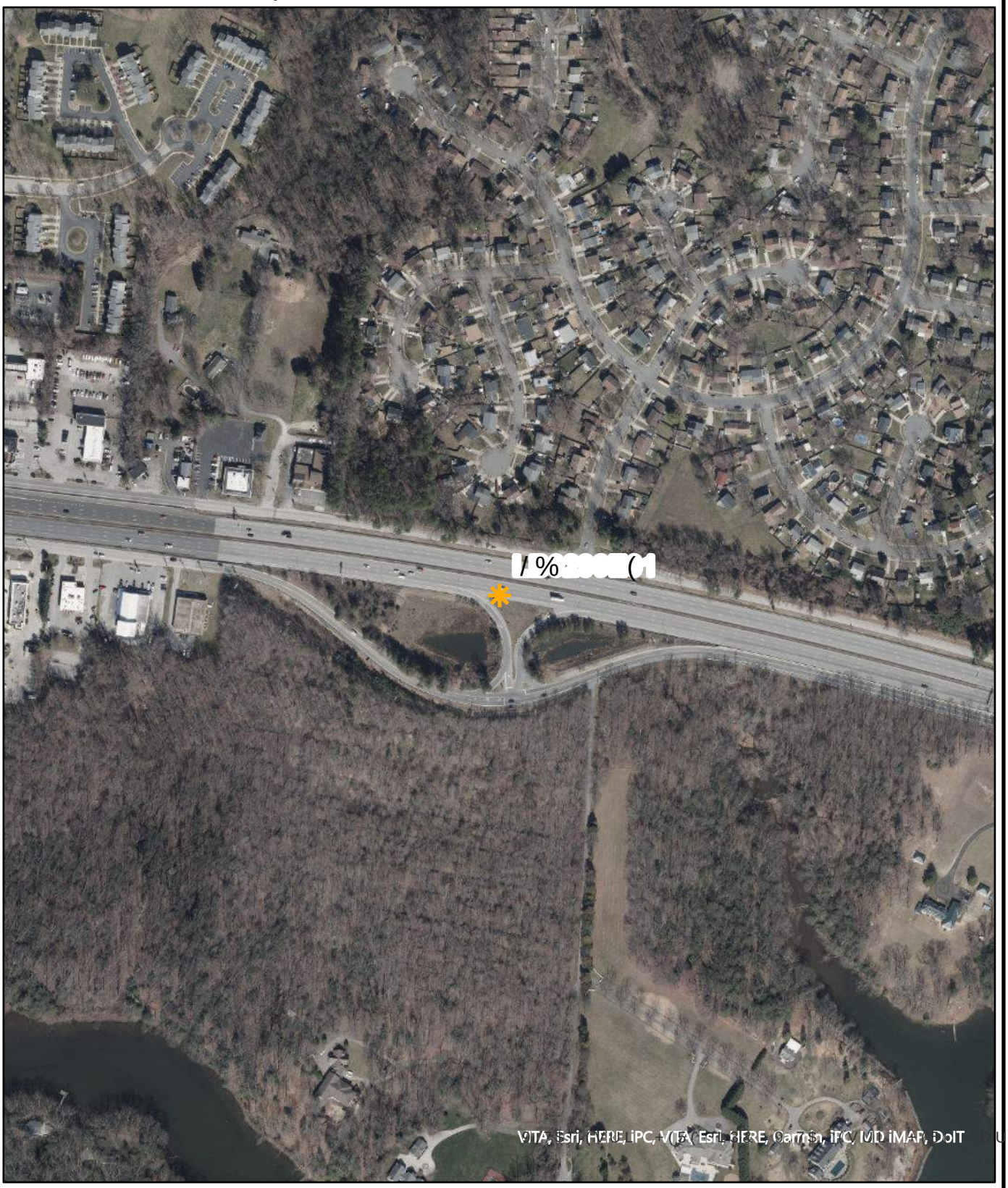
Maintenance Work Order Form for Ponds/ Basins				
BMP ID:				
BMP Type/ Subtype:				
Location (Highway/ Facility, Mile Marker, Direction):				
MAXIMO Tracking #:				
Engineering Division Contact:	Peter Mattejat, PE – Tel: (410) 537-7874; Email: pmattejat@mdta.state.md.us			
Staff Initials				
Action	**Date Work Issued**	**Date Work Performed**	**Date Post Work Inspection**	**Comments**
PREVENTATIVE MAINTENANCE				
1) **MOWING** - Mow to provide access to inflow, control, and outflow structures. Mow side slopes of the forebay and basin, trim excessive turf growth in basin (>6"). ***Do not mow landscape plants.***				
2) **TRASH & DEBRIS REMOVAL** – Remove trash and debris from the forebay, impoundment area, riser, and outfall.				
3) **VEGETATION MAINTENANCE** - Remove any woody vegetation (volunteers) in the BMP, adjacent side slopes and especially embankment. Remove woody vegetation near inflow, control and outflow structures.				
AS-NEEDED REPAIR / REMEDIATION				
4) **INVASIVE/ NOXIOUS VEGETATION CONTROL** – Manage invasive vegetation, specifically Phragmites, within the BMP.				
5) **SEDIMENT REMOVAL** – If forebay or impoundment is heavily sedimented, remove sediment and debris, Stabilize disturbed areas.				
6) **INFLOW STABILIZATION** - Stabilize discharge locations (e.g. riprap) as-needed at the outfall of inflow pipes, inflow channels, weir over-flows, and outfall. Stabilization methods typically include placement or redressing of stone or riprap.				
7) **SITE STABILIZATION** - Stabilize eroded / exposed areas. Stabilize with 4-inch topsoil, seed & mulch, and cover with Type A soil stabilization matting.				
8) **IMPOUNDMENT MAINTENANCE** - Repair eroded / exposed areas. If ponding is excessive, contact OEC Environmental Engineering				
9) **CONTROL STRUCTURE MAINTENANCE** - Repair defects to control structure (e.g, cracks, clogged low-flow pipes / openings, pipe separations).				
10) **LANDSCAPING** - replace / supplement landscaping.				
Maintenance Performed by:			**Date:** / / **to** / /	
NOTE: If major issues are encountered or guidance is required, contact MDTA Engineering Division.				

Maintenance Work Order Form for Small Scale/ Linear				
BMP ID:				
BMP Type/ Subtype:				
Location (Highway/ Facility, Mile Marker, Direction):				
MAXIMO Tracking #:				
Engineering Division Contact:	Peter Mattejat, PE – Tel: (410) 537-7874; Email: pmattejat@mdta.state.md.us			
Staff Initials				
Action	**Date Work Issued**	**Date Work Performed**	**Date Post Work Inspection**	**Comments**
PREVENTATIVE MAINTENANCE				
1) MOWING - Mow side slopes, perimeter area trim excessive turf growth (>6"). **Do not mow landscape plants.**				
2) TRASH & DEBRIS REMOVAL – Remove trash and debris from within and around site.				
3) VEGETATION MAINTENANCE - Remove any woody vegetation (volunteers) in the BMP, adjacent side slopes and near inflow, control and outflow structures.				
Check for standing water in observation well. In case of 'significant' depth of water after 72 hours since last significant rainfall, contact OEC Environmental Engineering.				
AS-NEEDED REPAIR / REMEDIATION				
4) **INVASIVE/ NOXIOUS VEGETATION CONTROL** – Manage invasive vegetation, specifically Phragmites, within the BMP.				
5) SEDIMENT REMOVAL – If impoundment is heavily sedimented, remove sediment and debris, Stabilize disturbed areas.				
6) **INFLOW STABILIZATION** - Stabilize discharge locations (e.g. riprap) as-needed at the outfall of inflow pipes, inflow channels, weir over-flows, and outfall. Also includes stabilization adjacent to roadway edge. Stabilization methods typically include placement or redressing of stone or riprap.				
7) **SITE STABILIZATION** - Stabilize eroded / exposed areas. Stabilize with 4-inch topsoil, seed & mulch, and cover with Type A soil stabilization matting.				
8) **IMPOUNDMENT MAINTENANCE** – Repair eroded areas. Replace surface media as-needed. If ponding is excessive, contact OEC Environmental Engineering				
9) **UNDERDRAIN/ OUTLET MAINTENANCE** – Clear clogs within underdrain network, maintain stable outlet.				
10) **LANDSCAPING** - replace / supplement landscaping.				
Maintenance Performed by:			**Date:** / / **to** / /	
NOTE: If major issues are encountered or guidance is required, contact MDTA Engineering Division.				

Appendix B – BMP Maps and Photos

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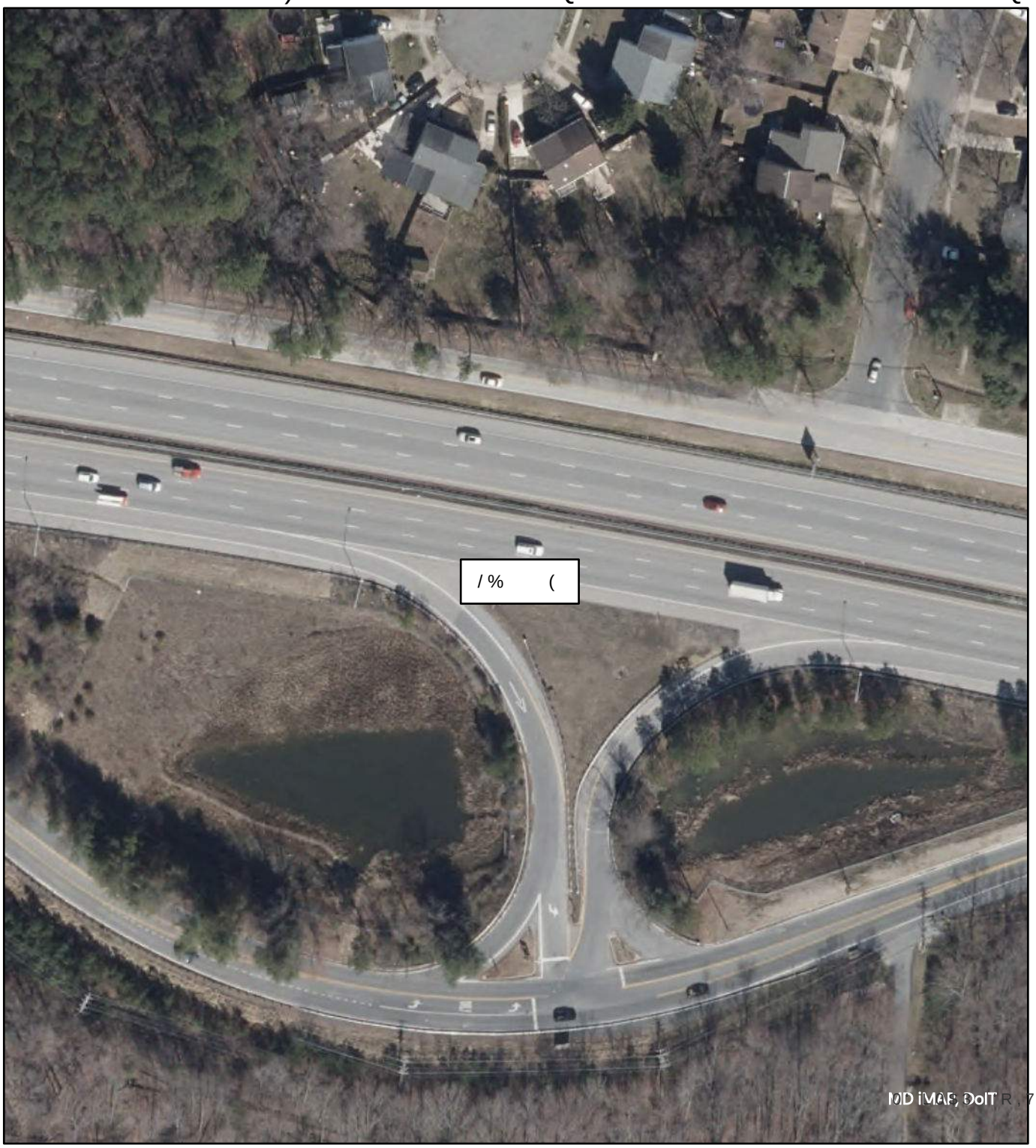
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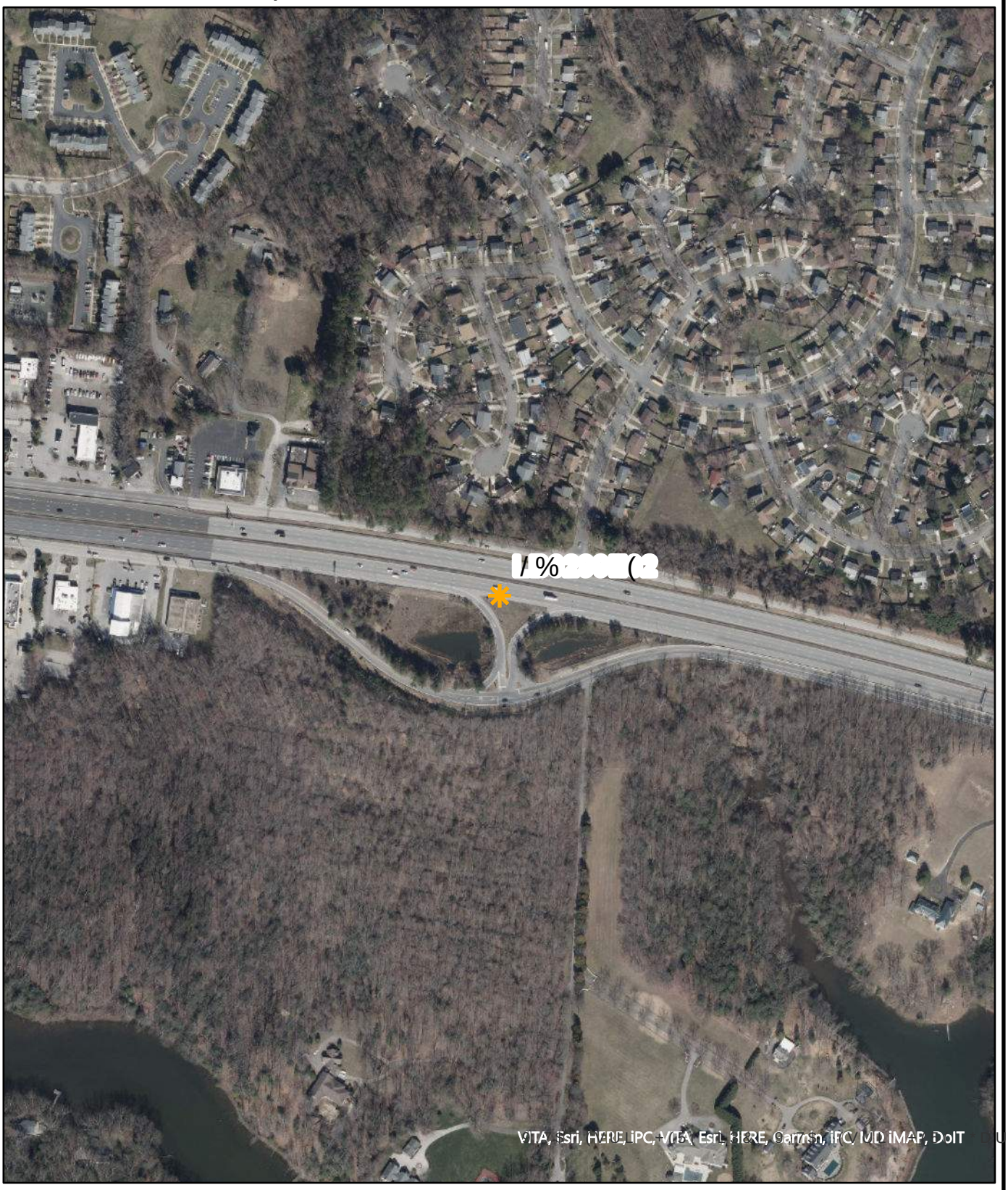
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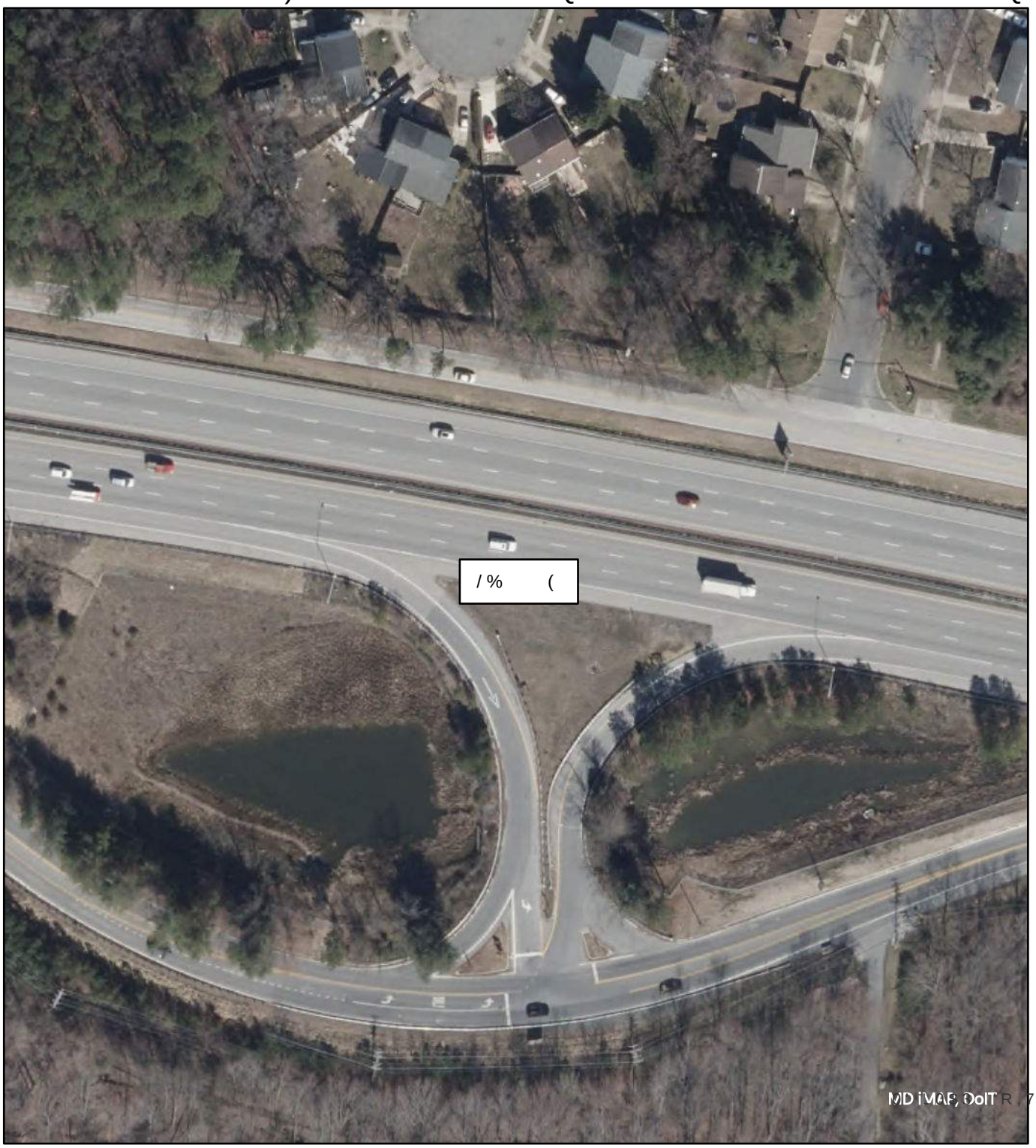
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Maryland Transportation Authority

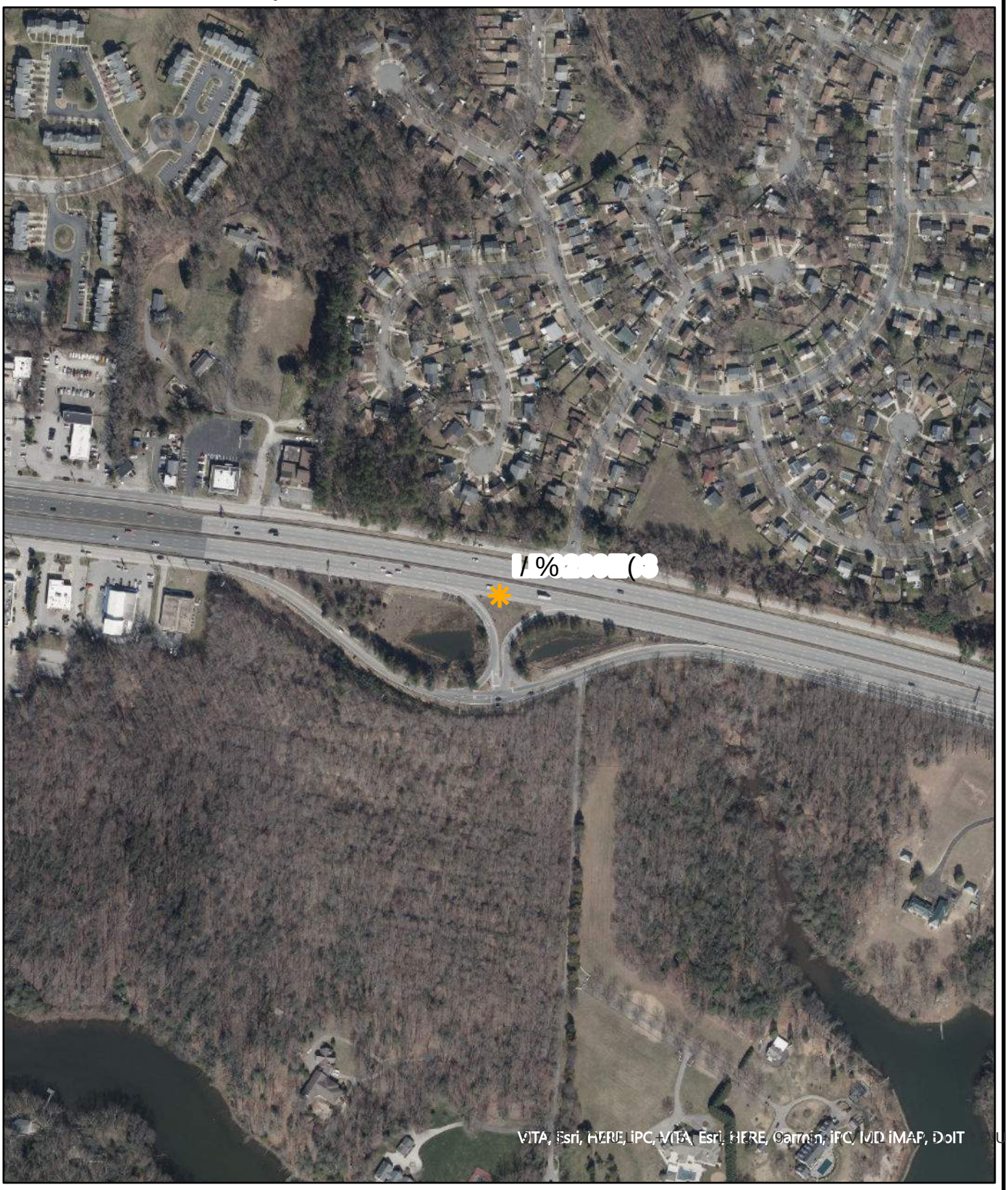
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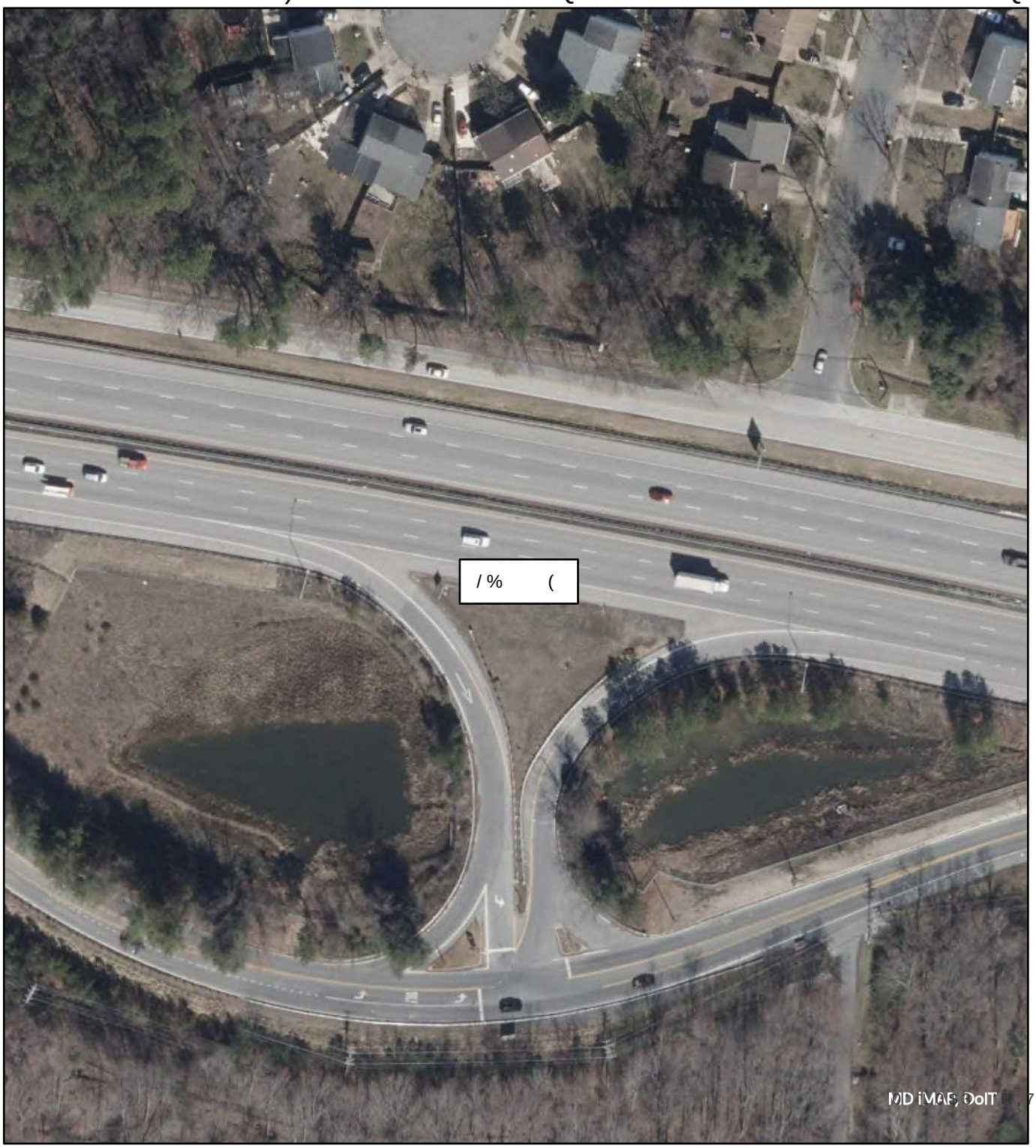
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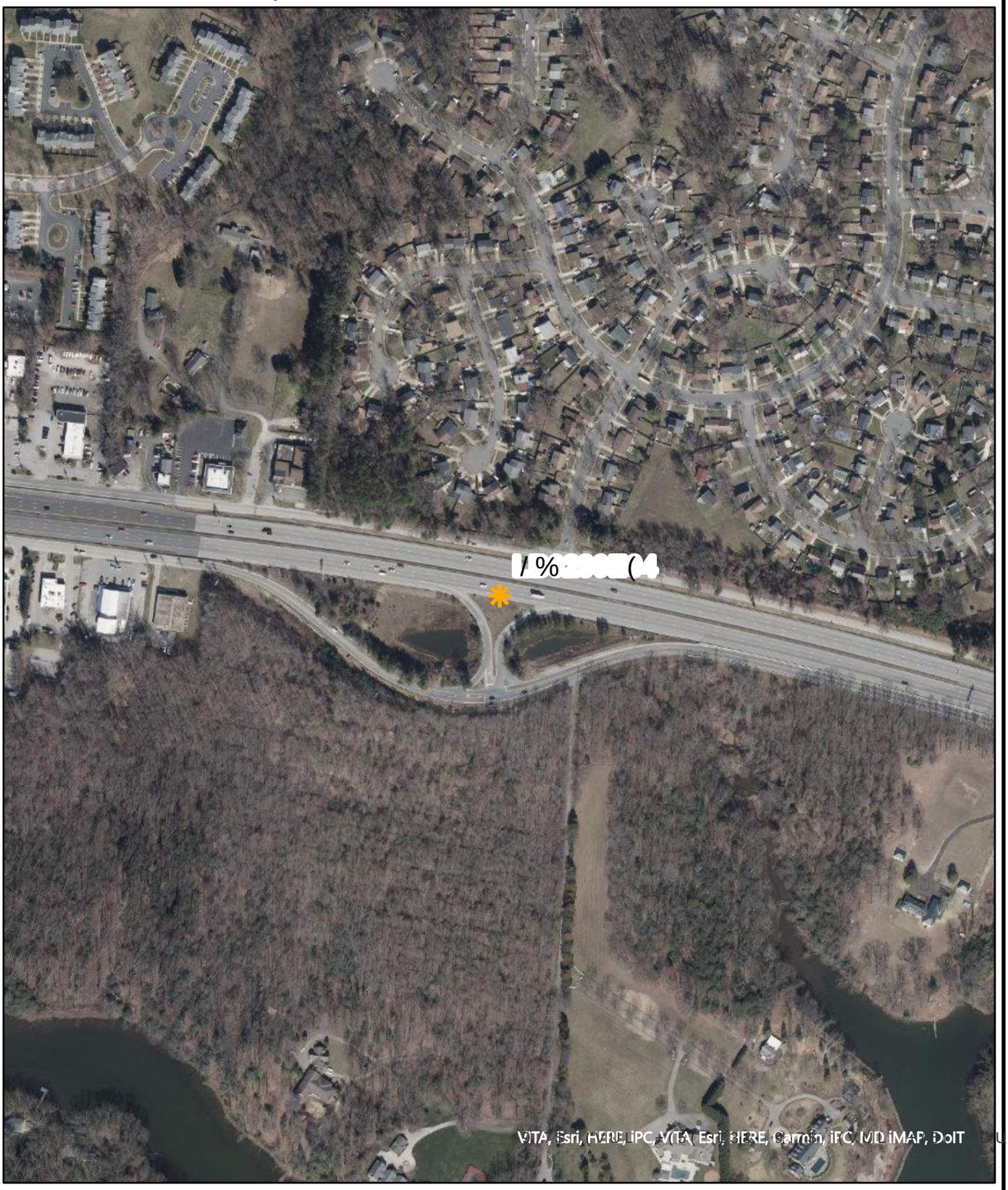
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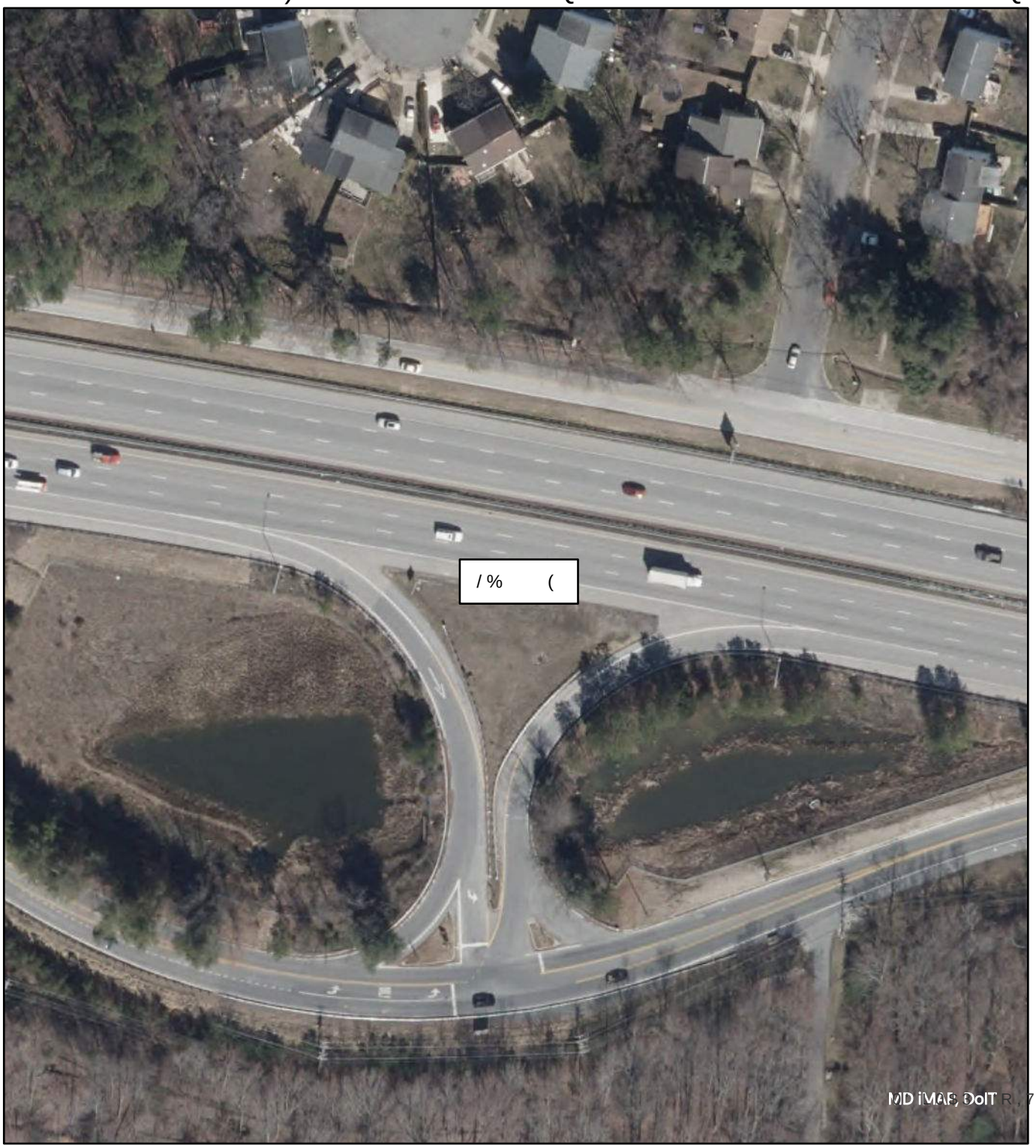
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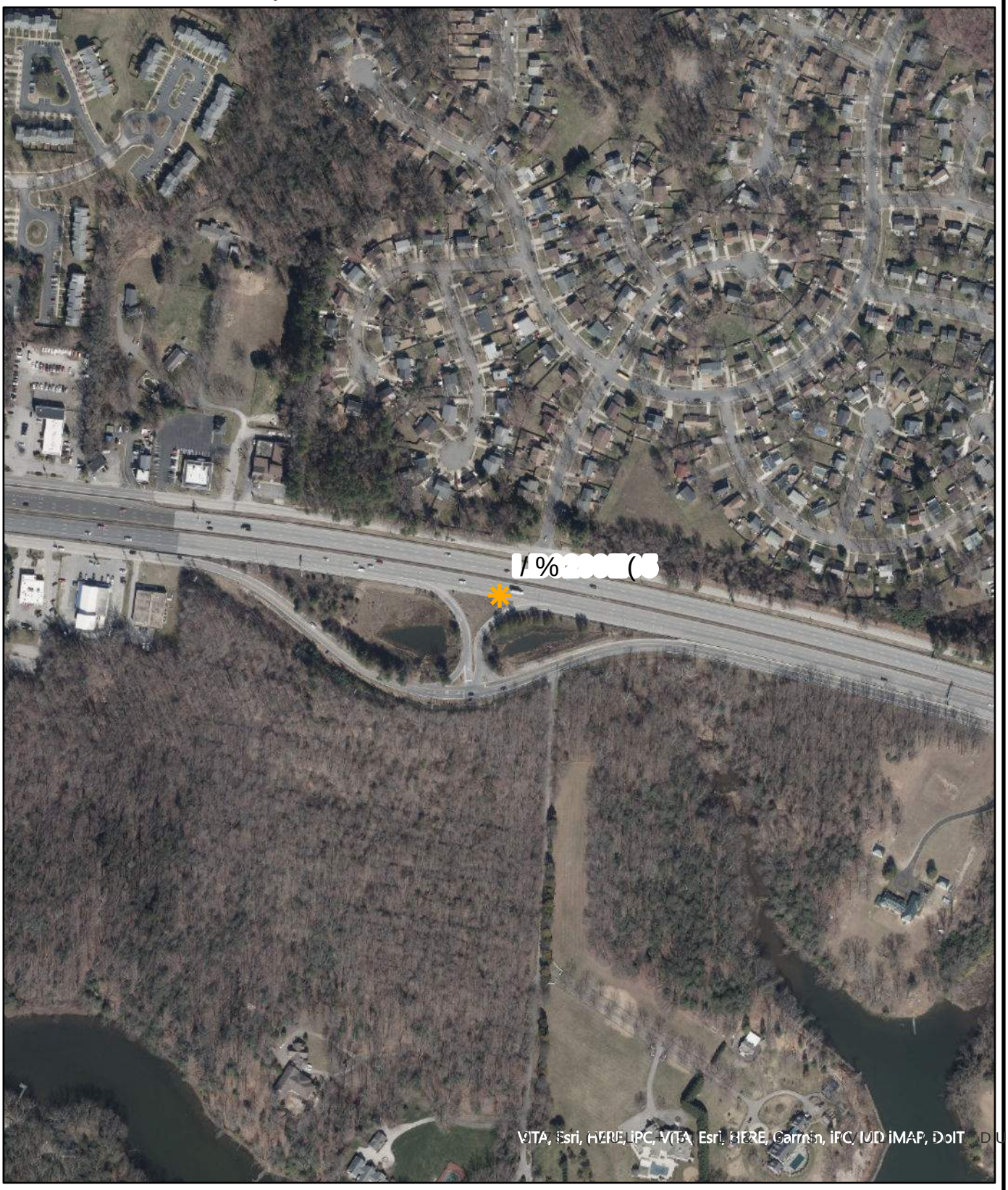
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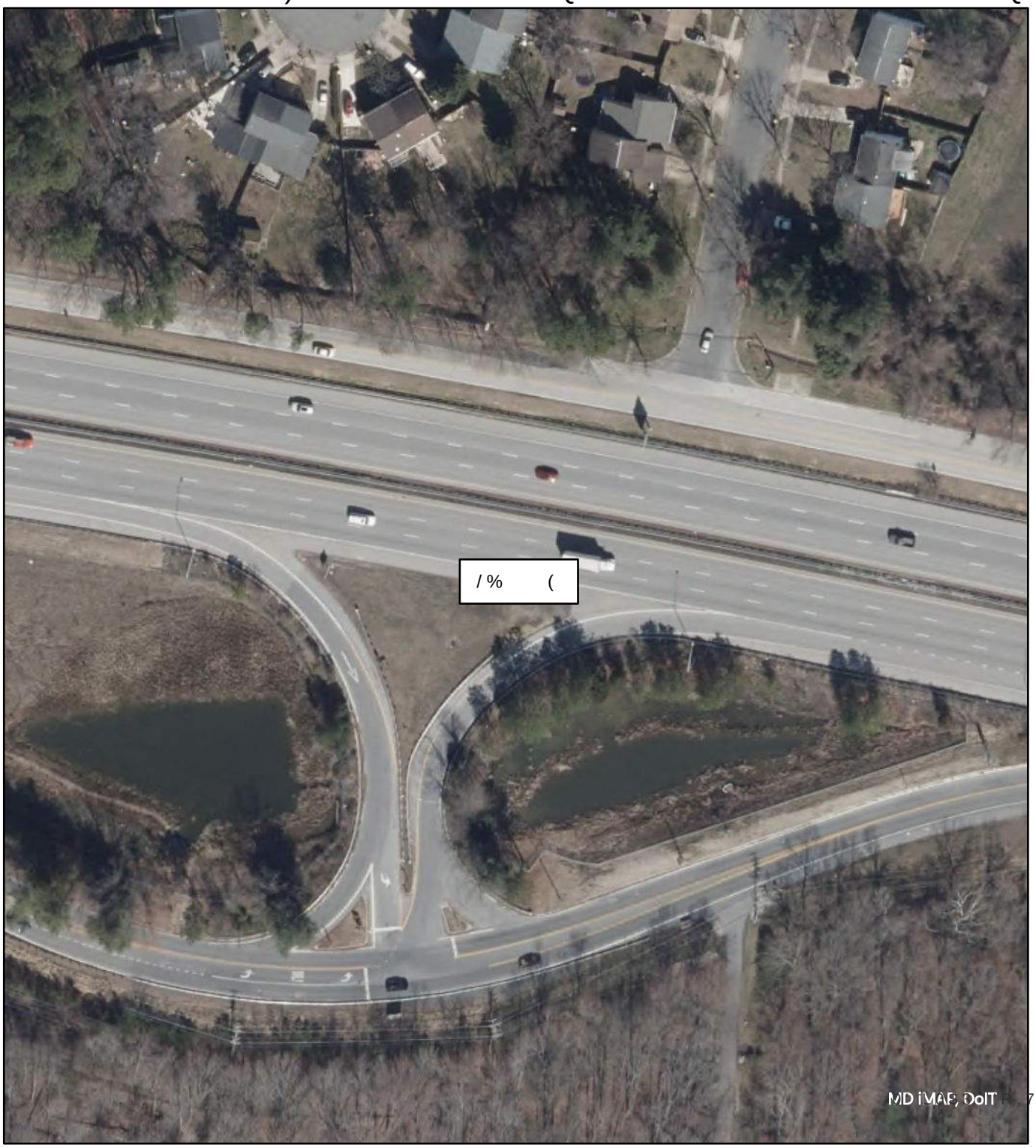
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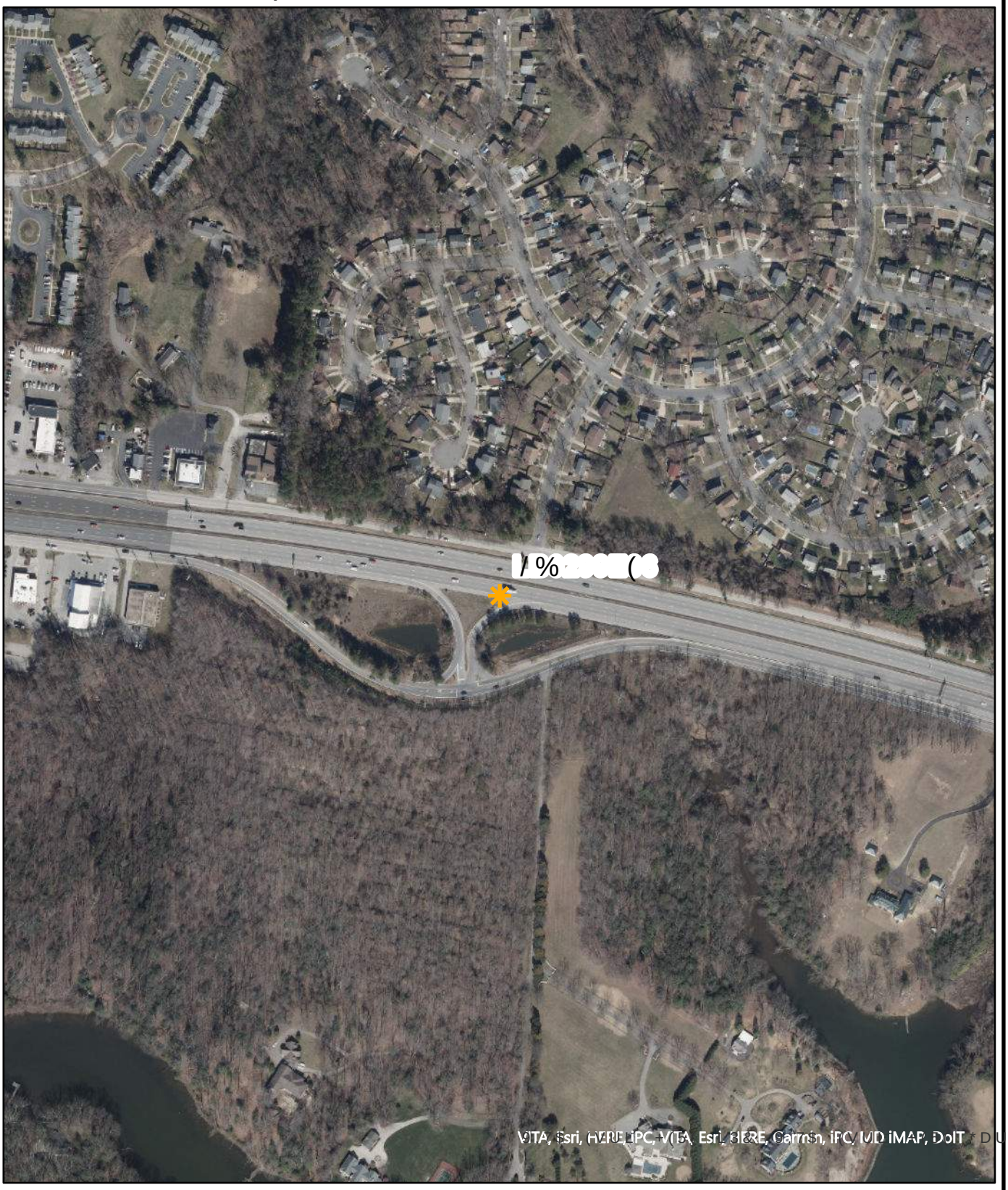
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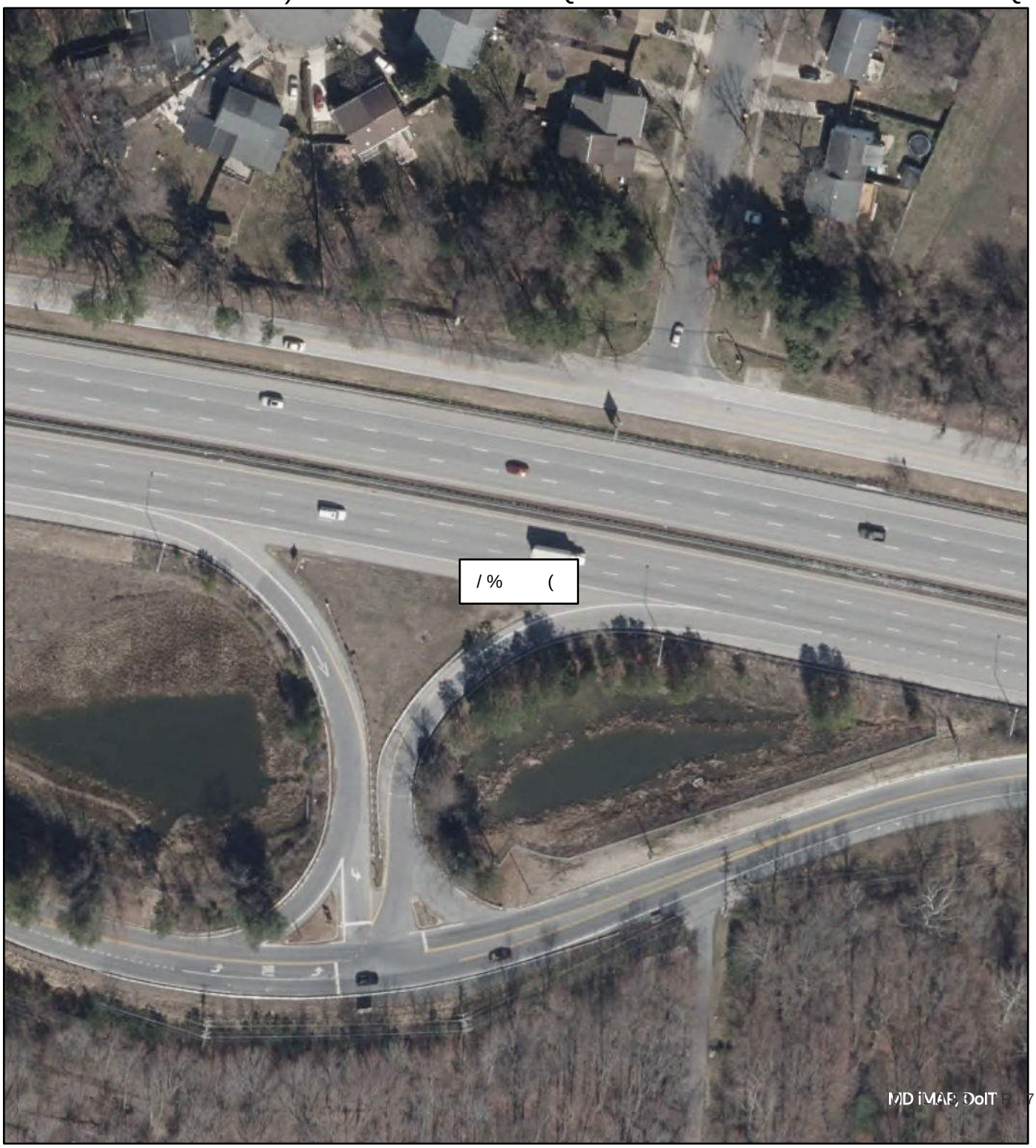
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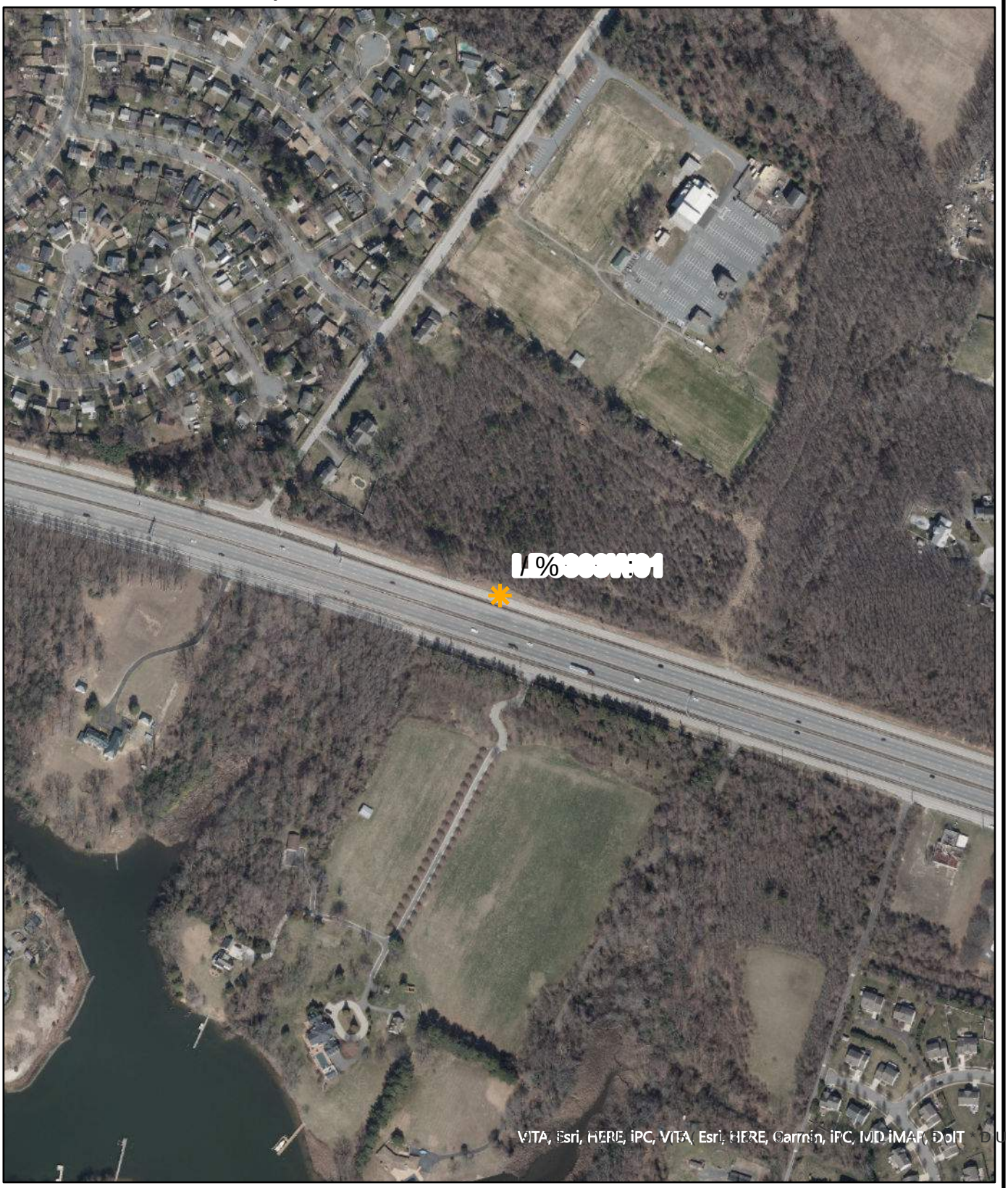
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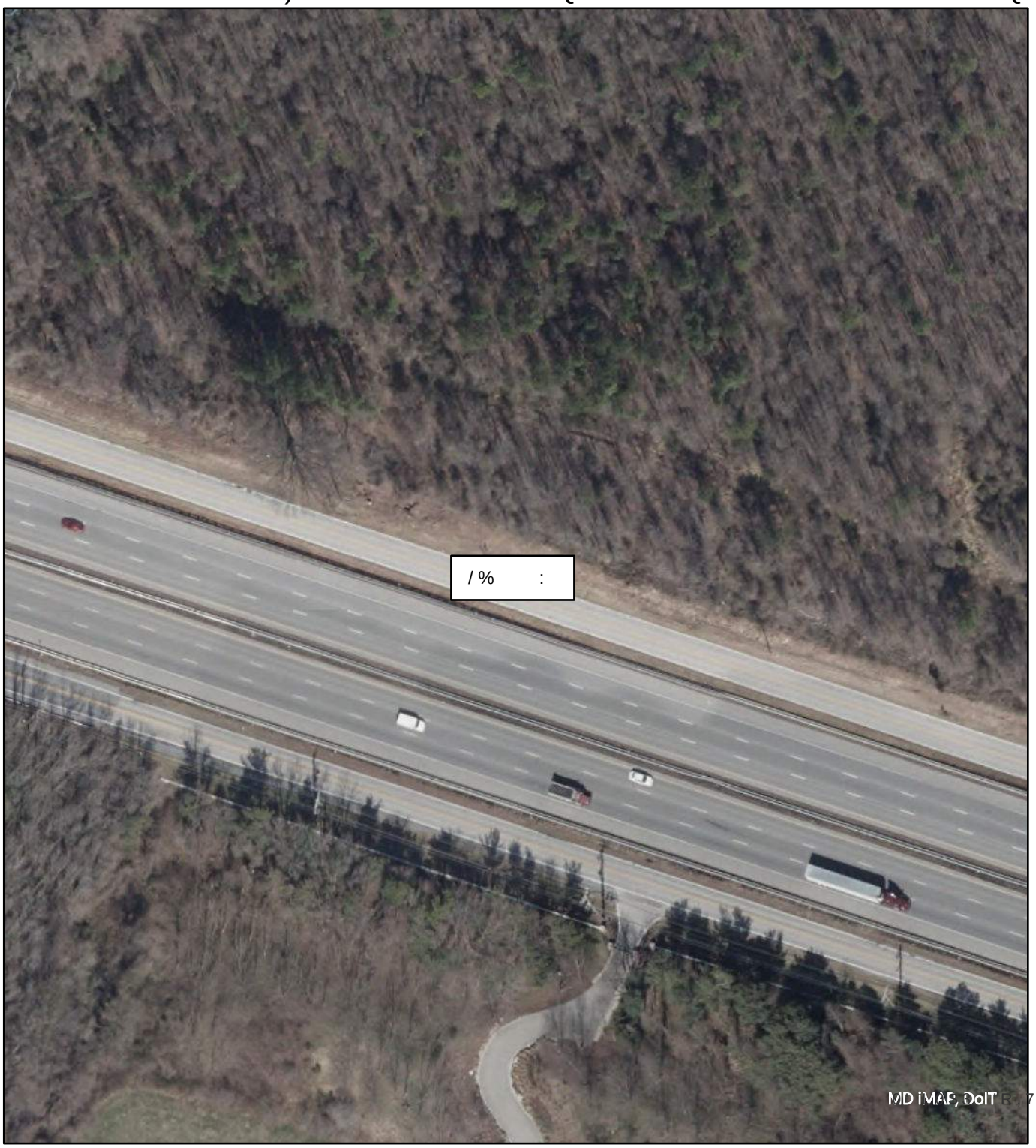
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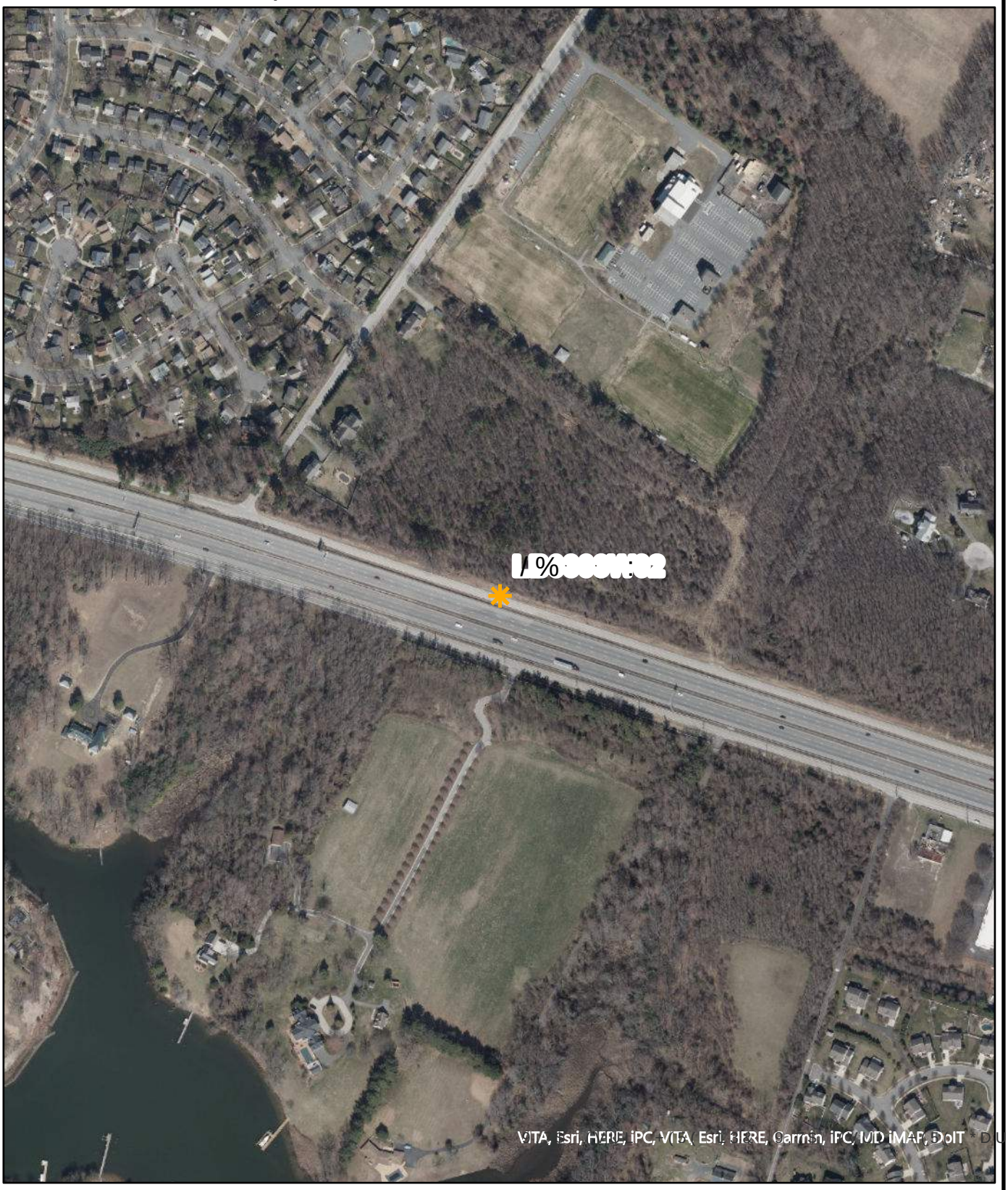
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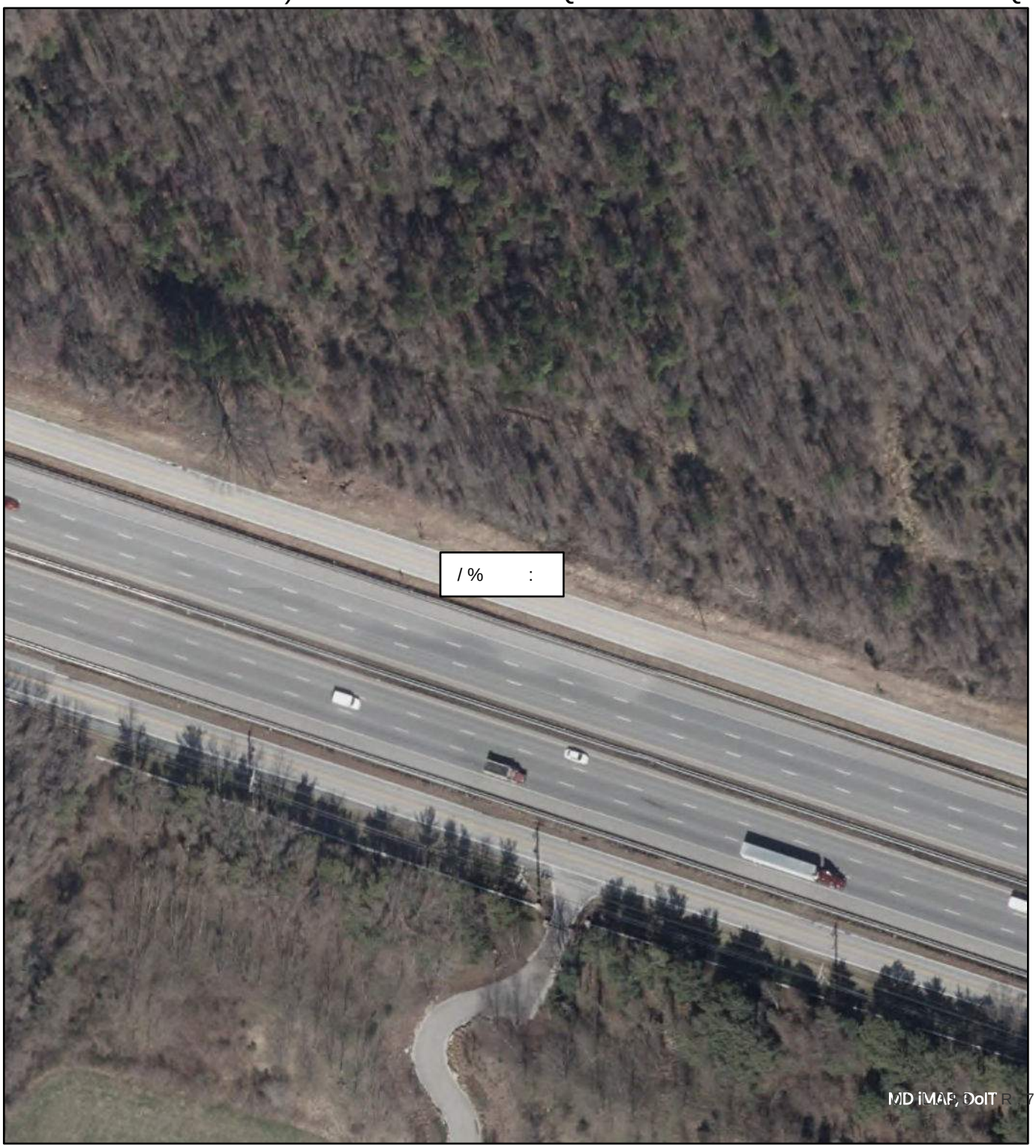
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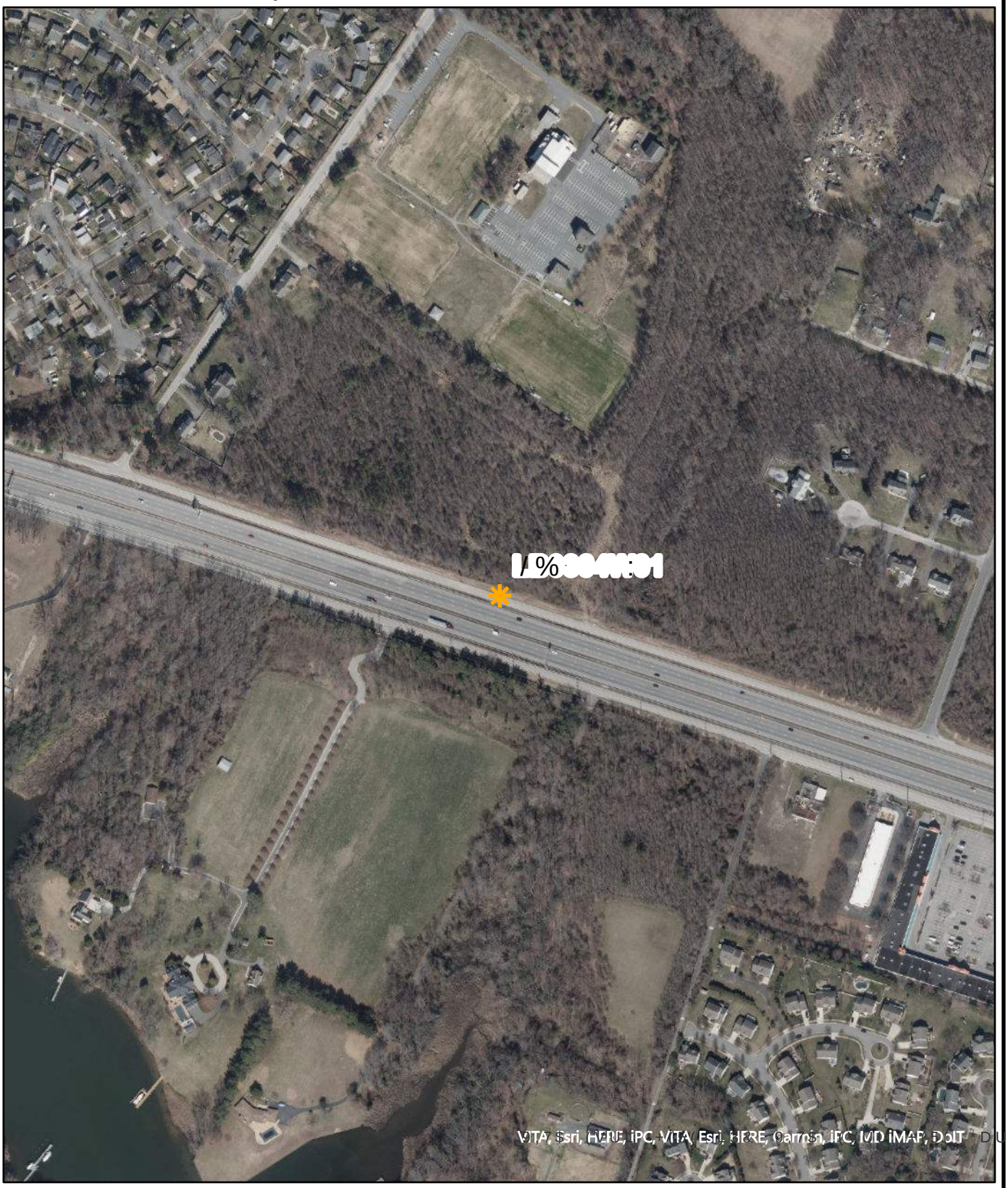
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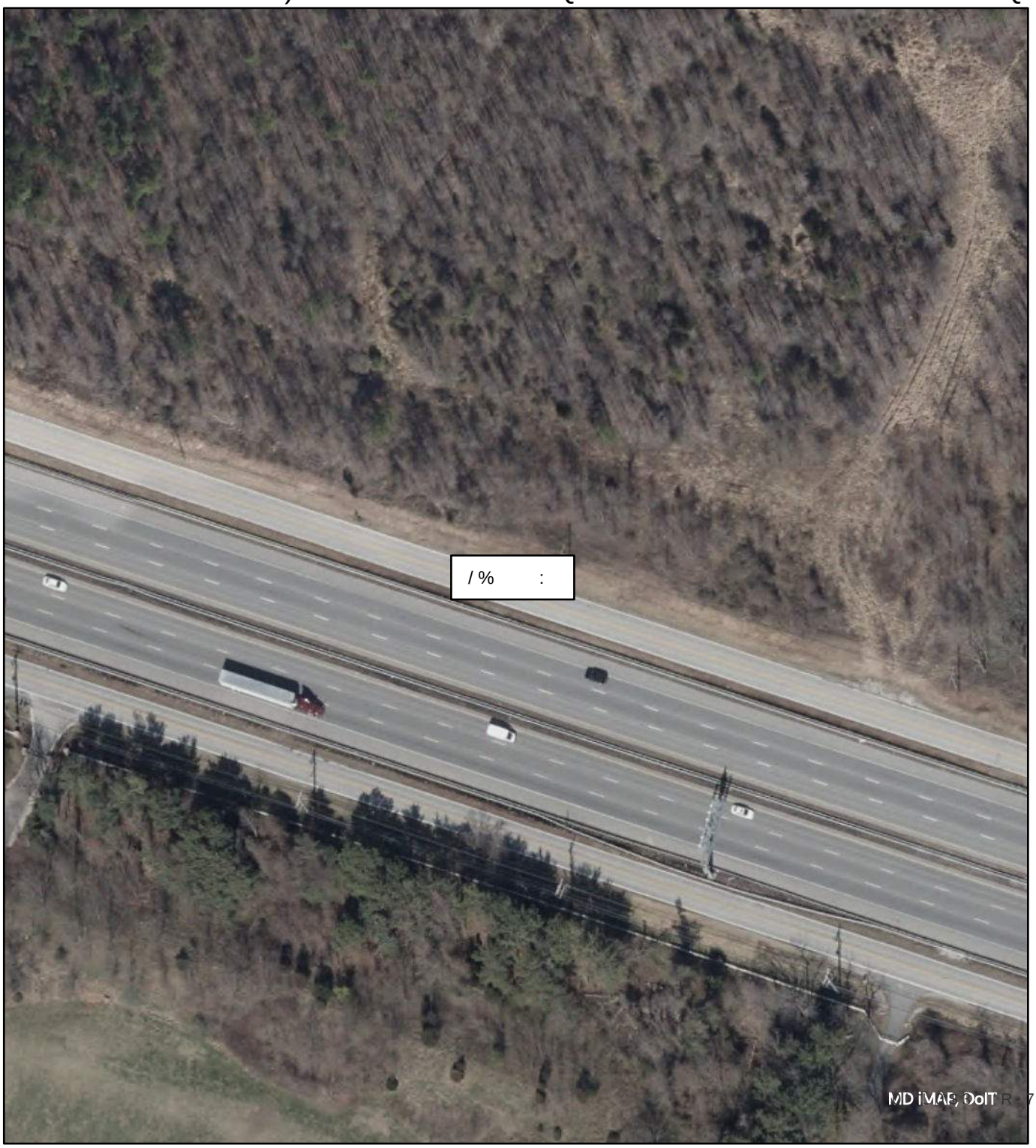
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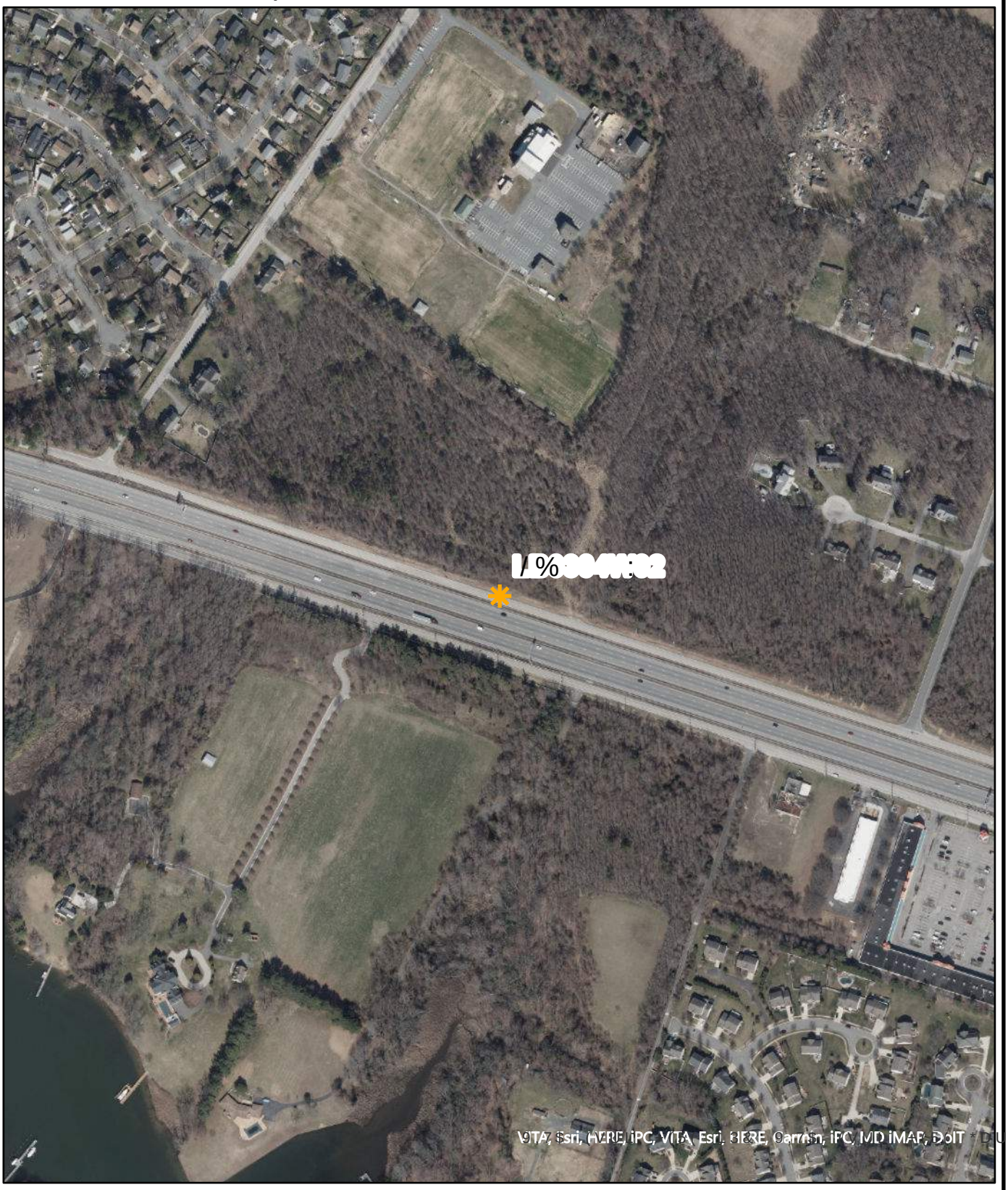
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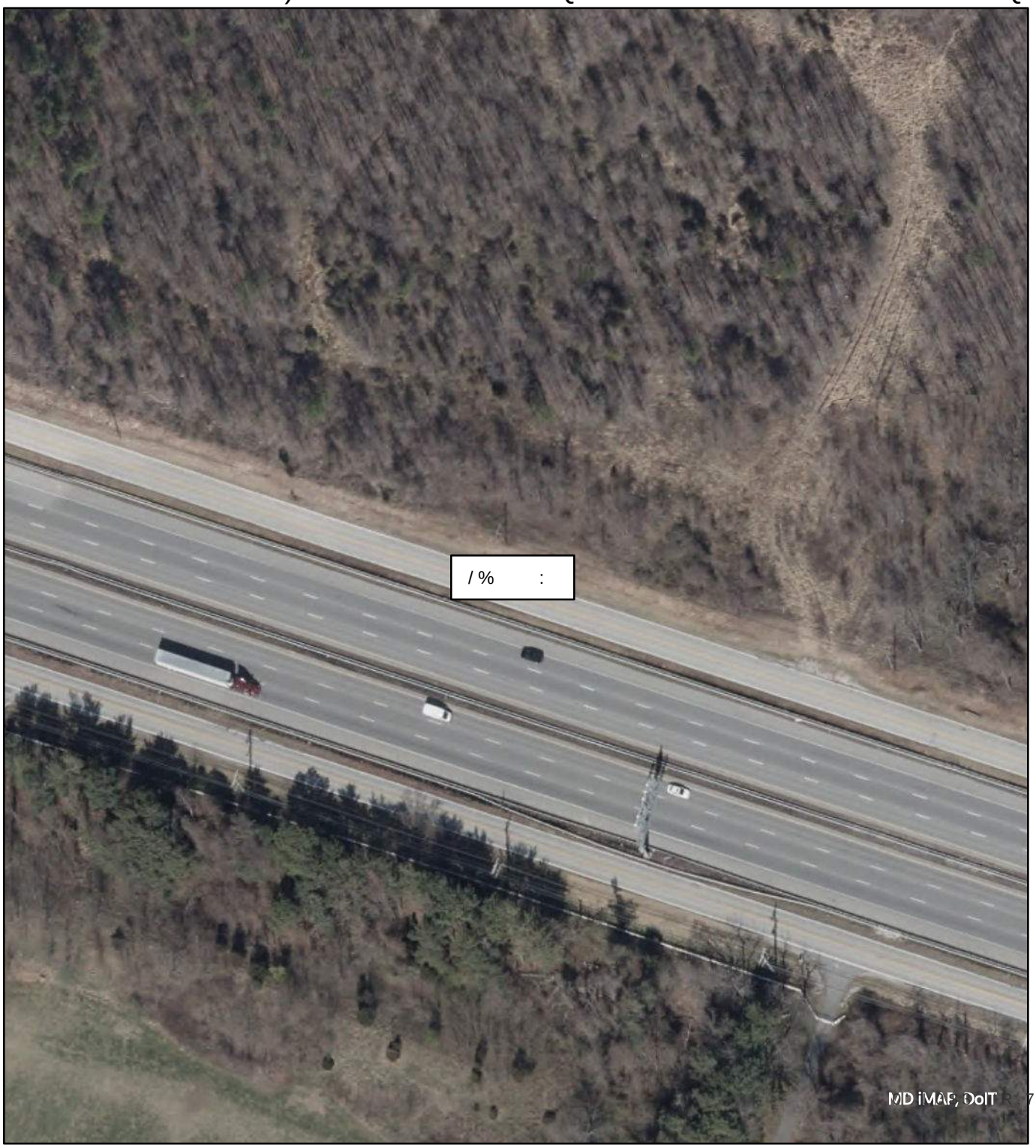
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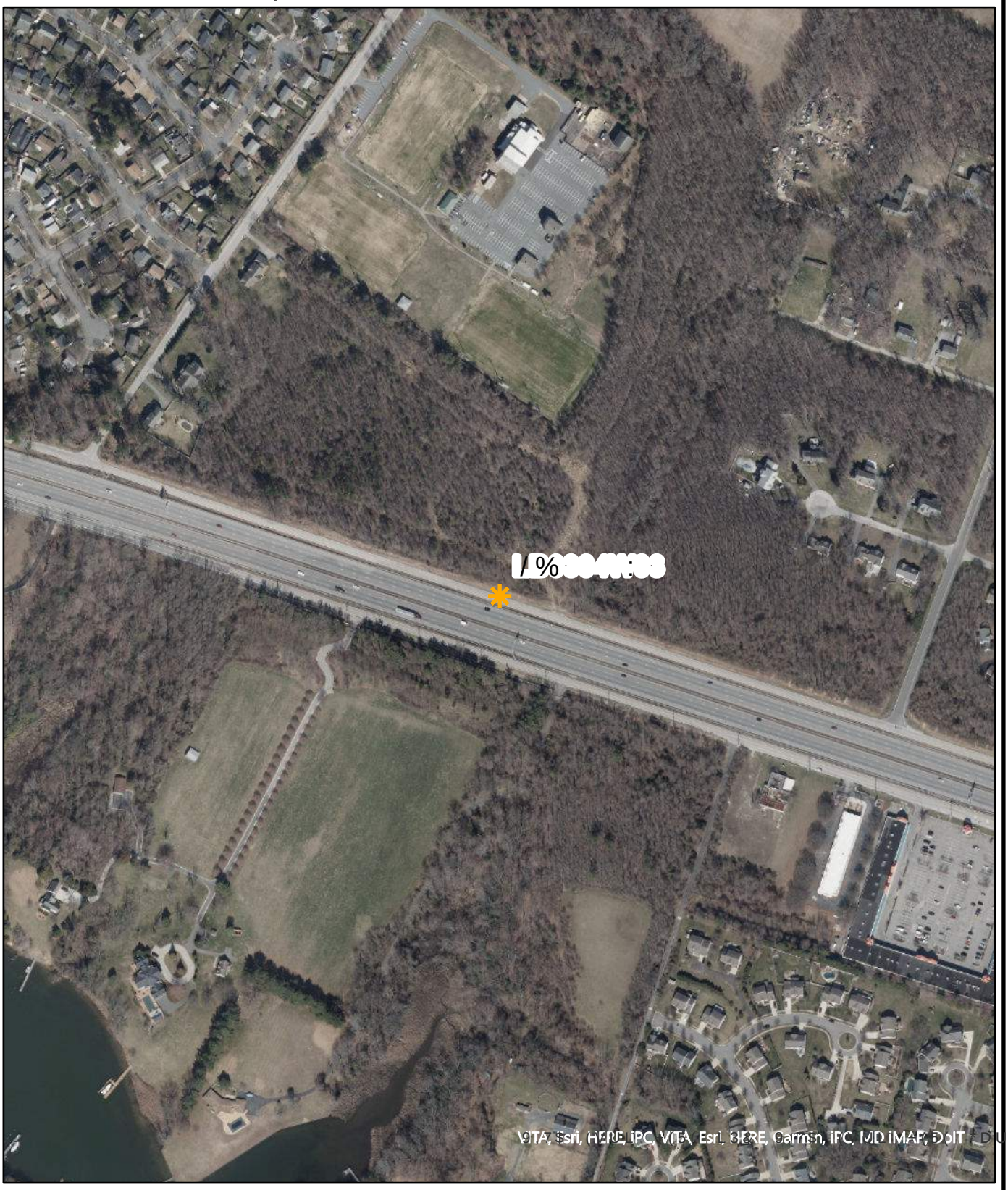
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Maryland Transportation Authority

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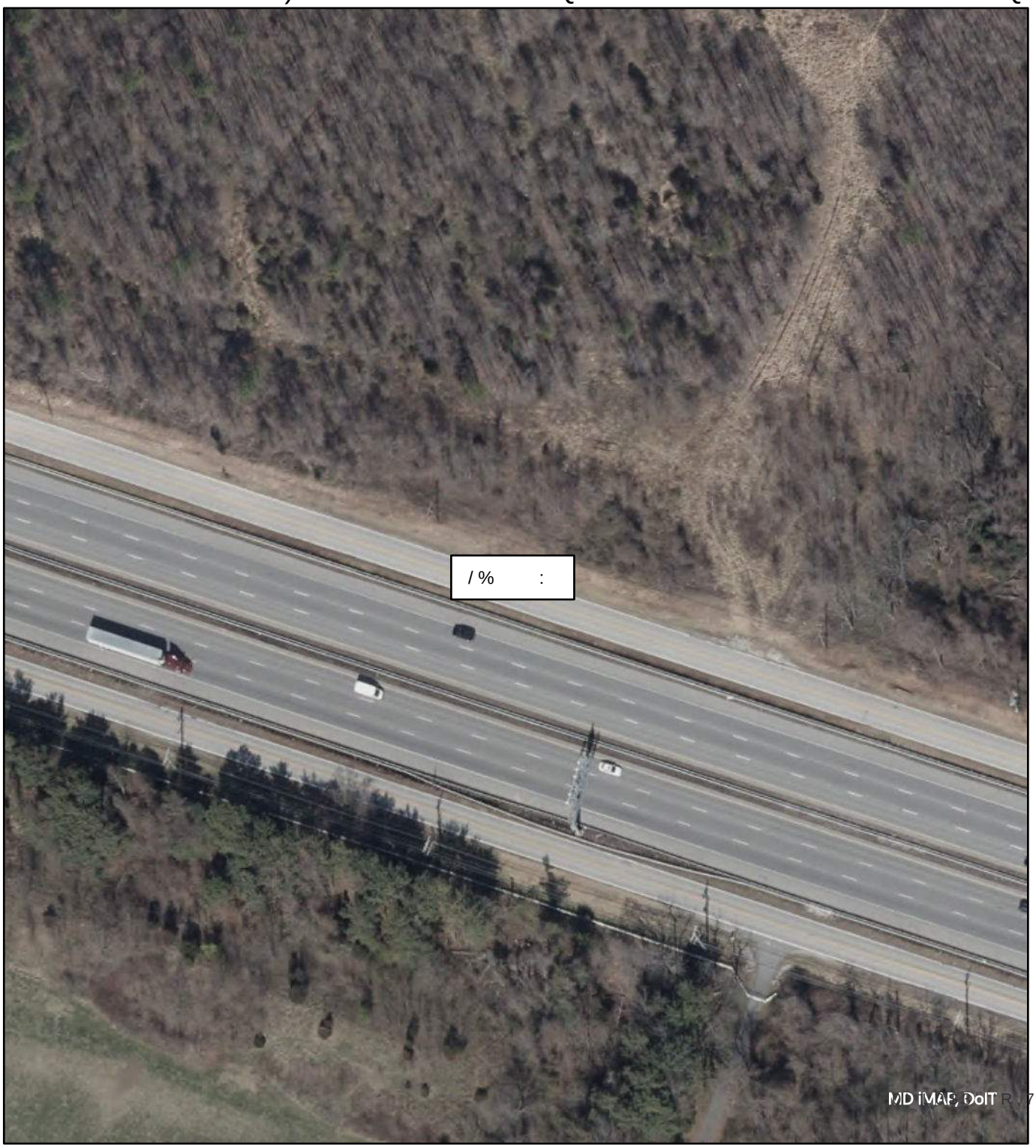
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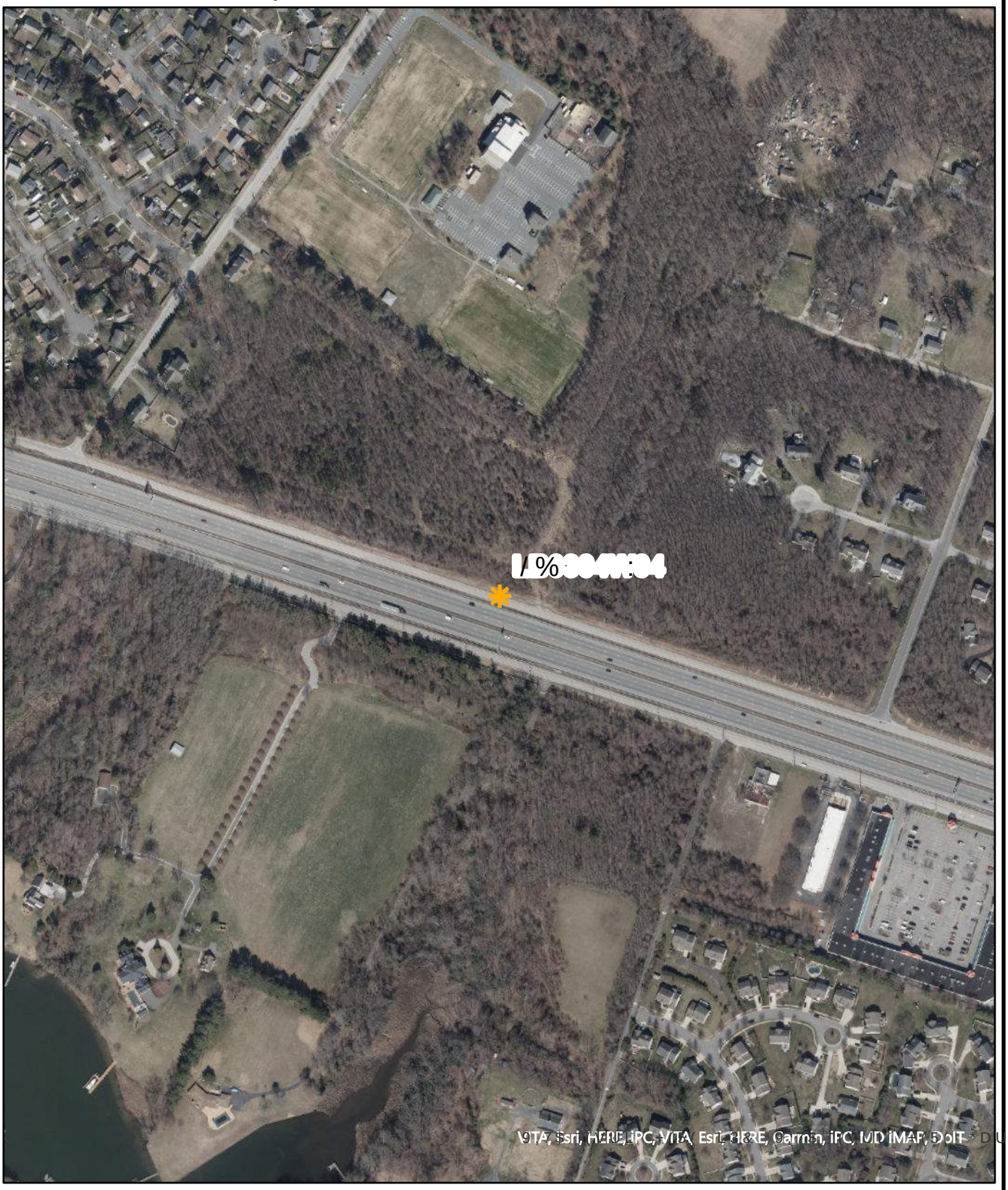
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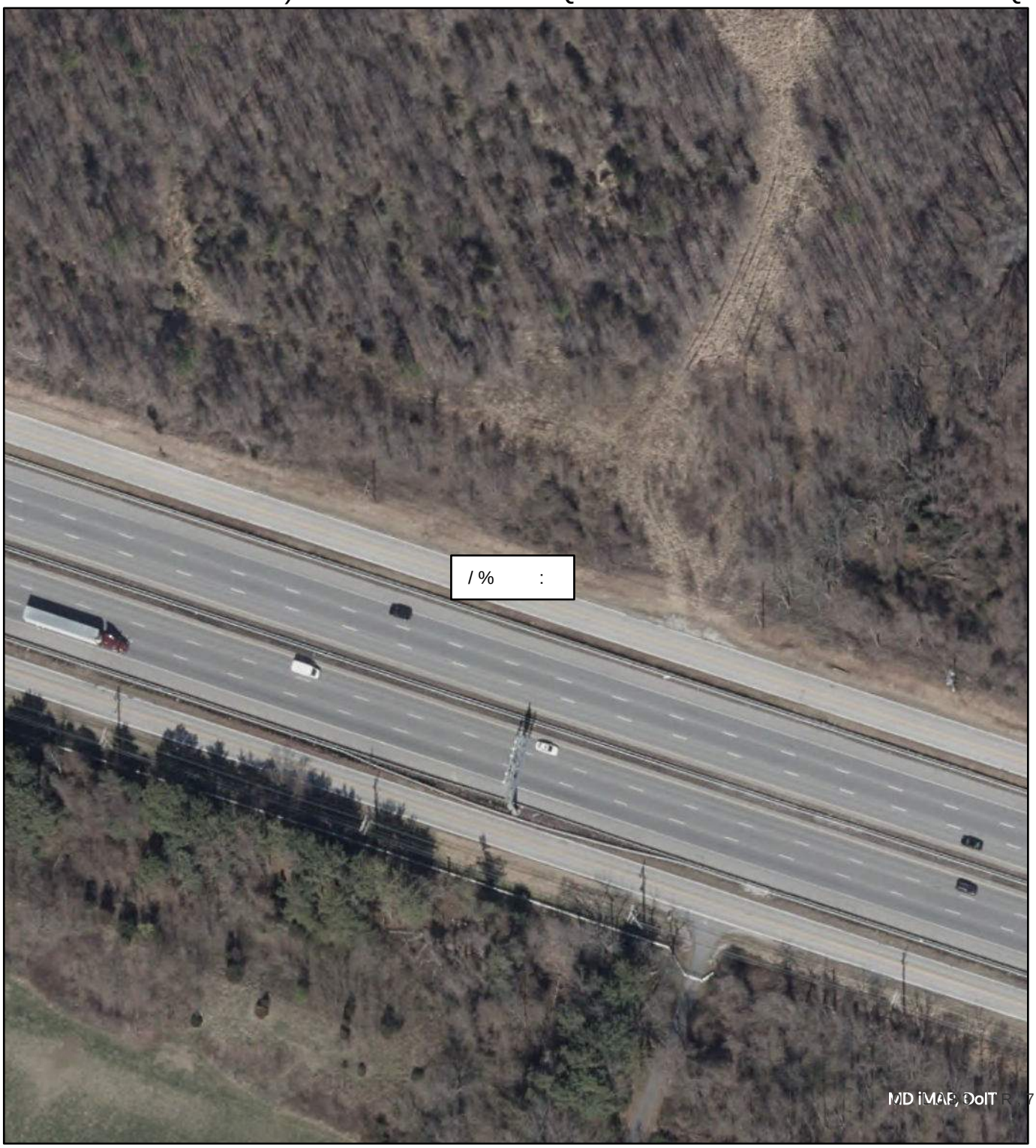
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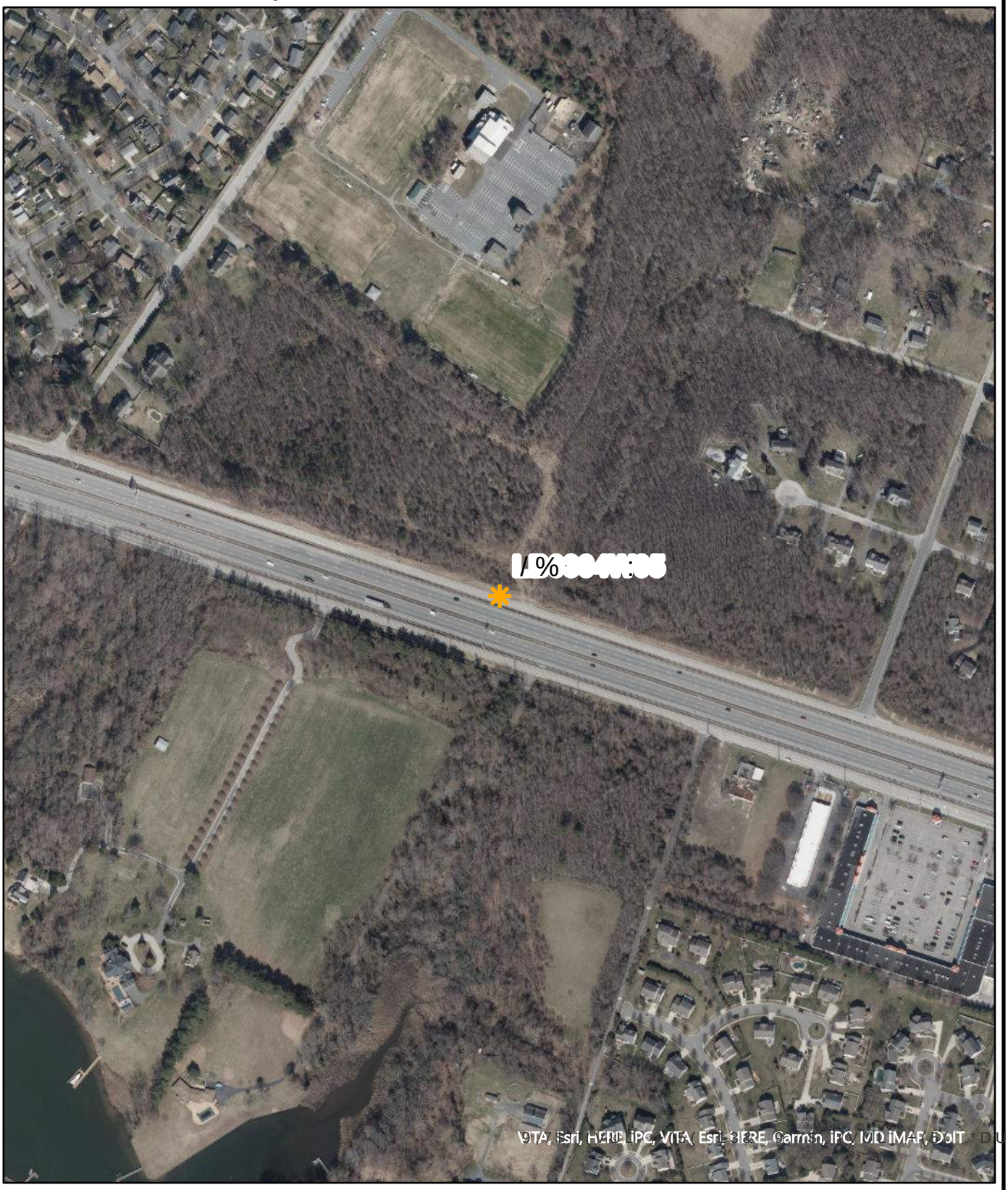
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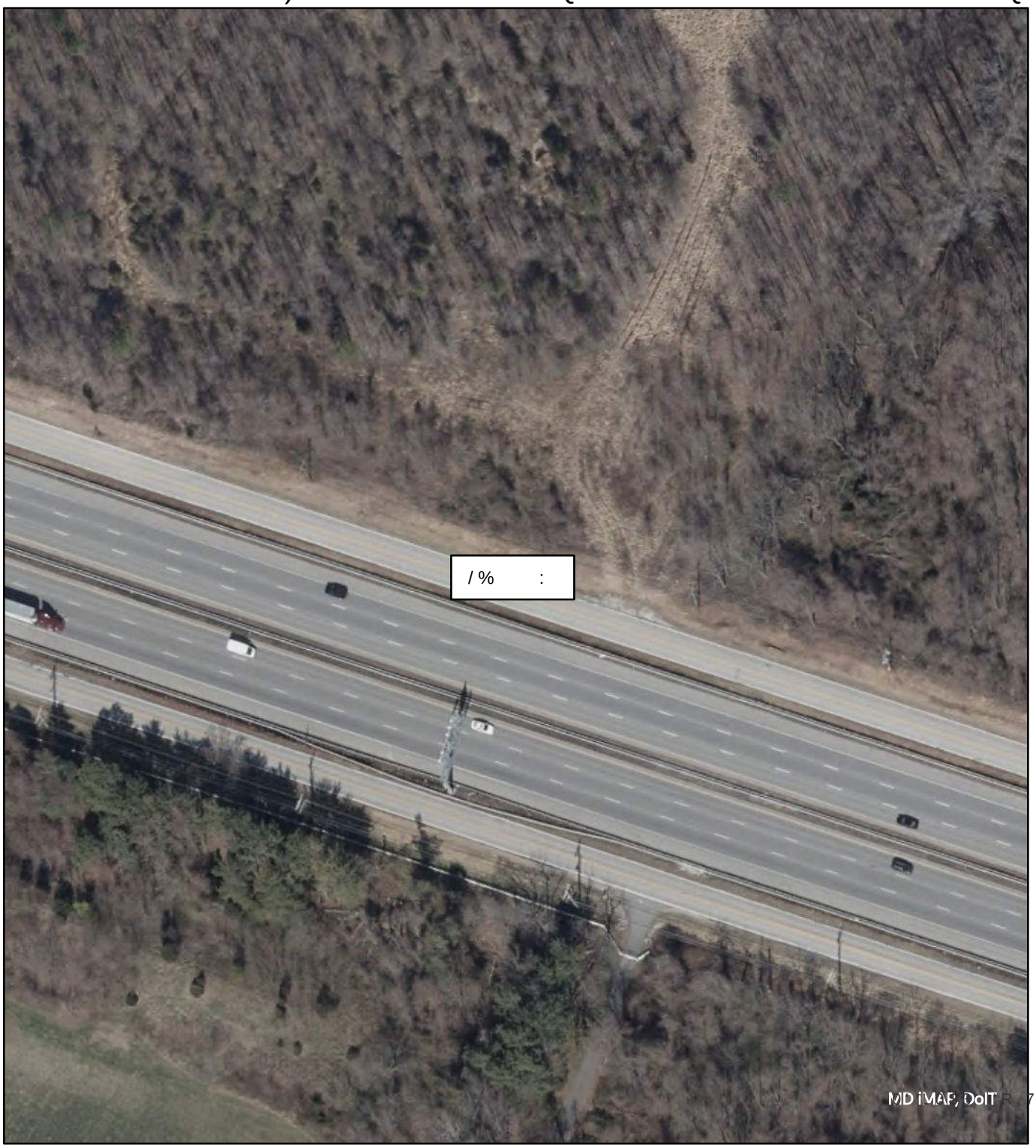
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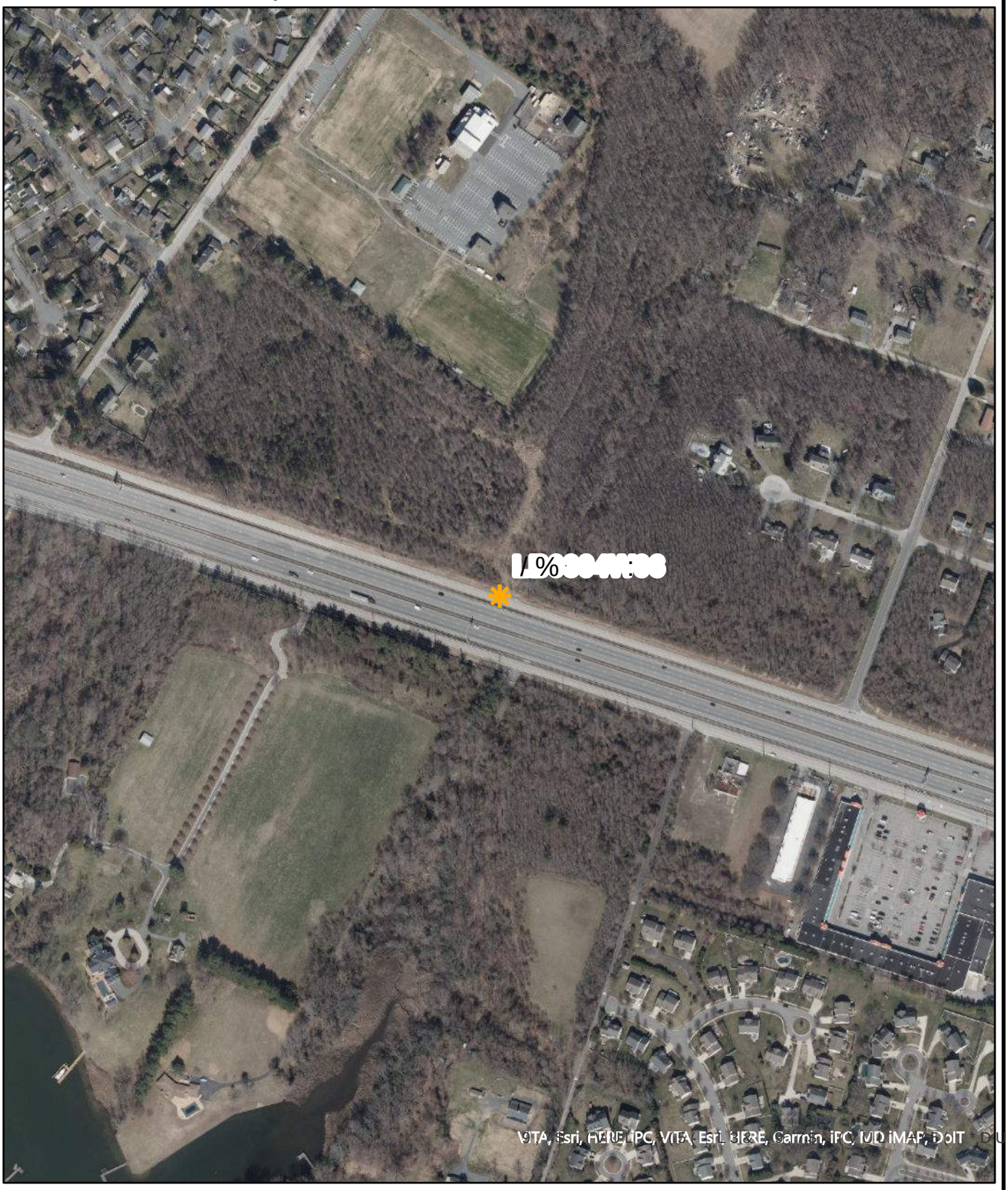
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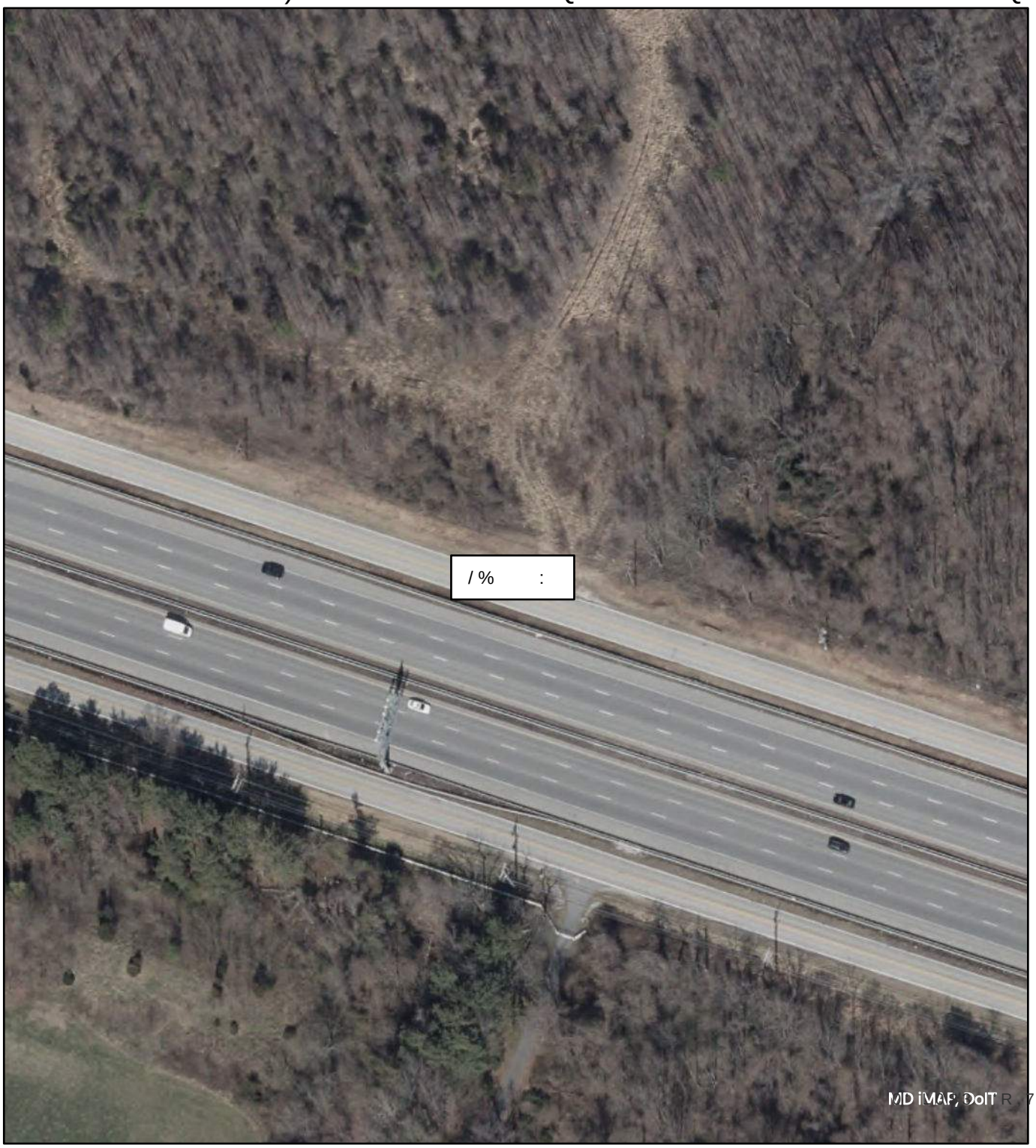
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Maryland Transportation Authority

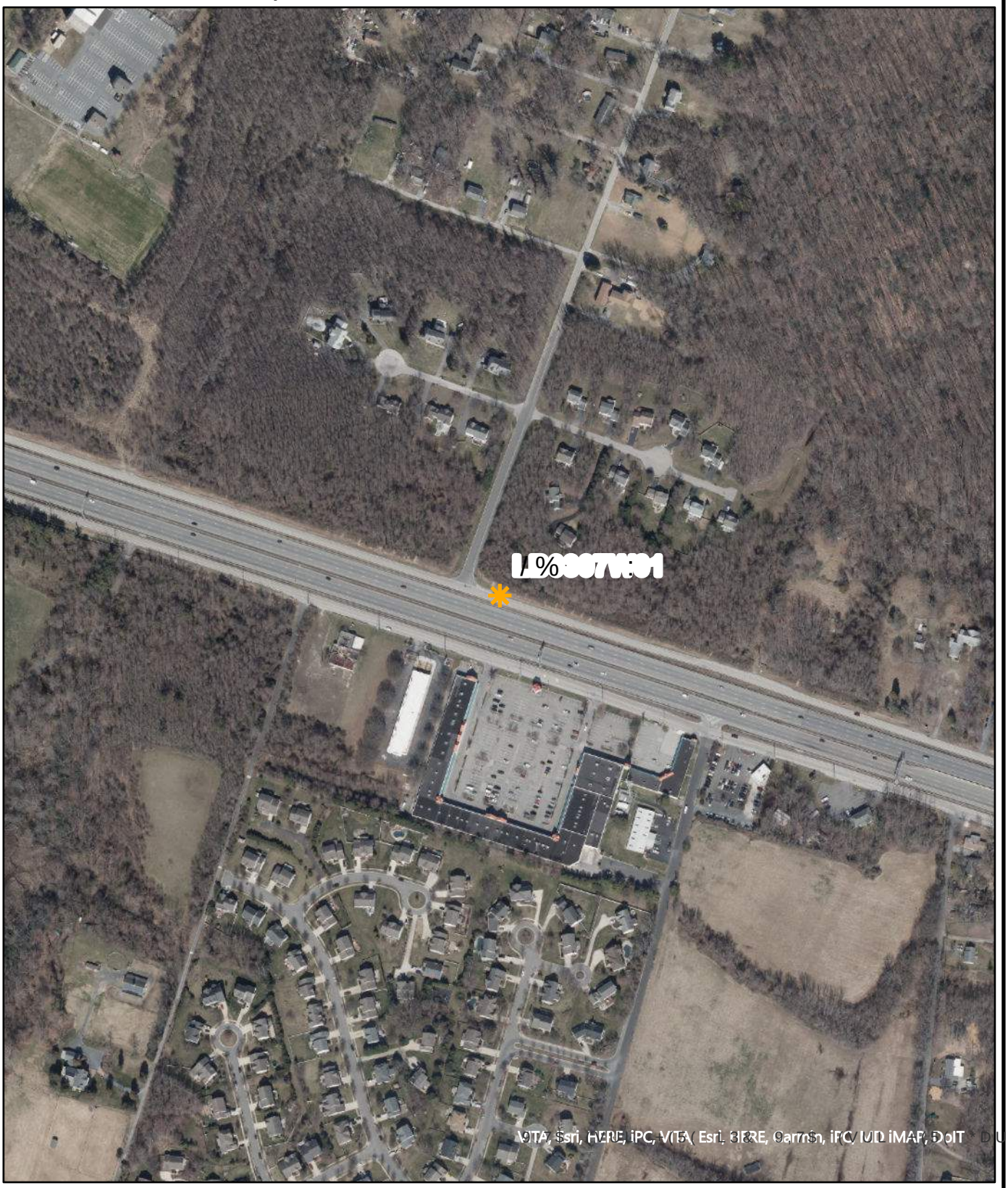
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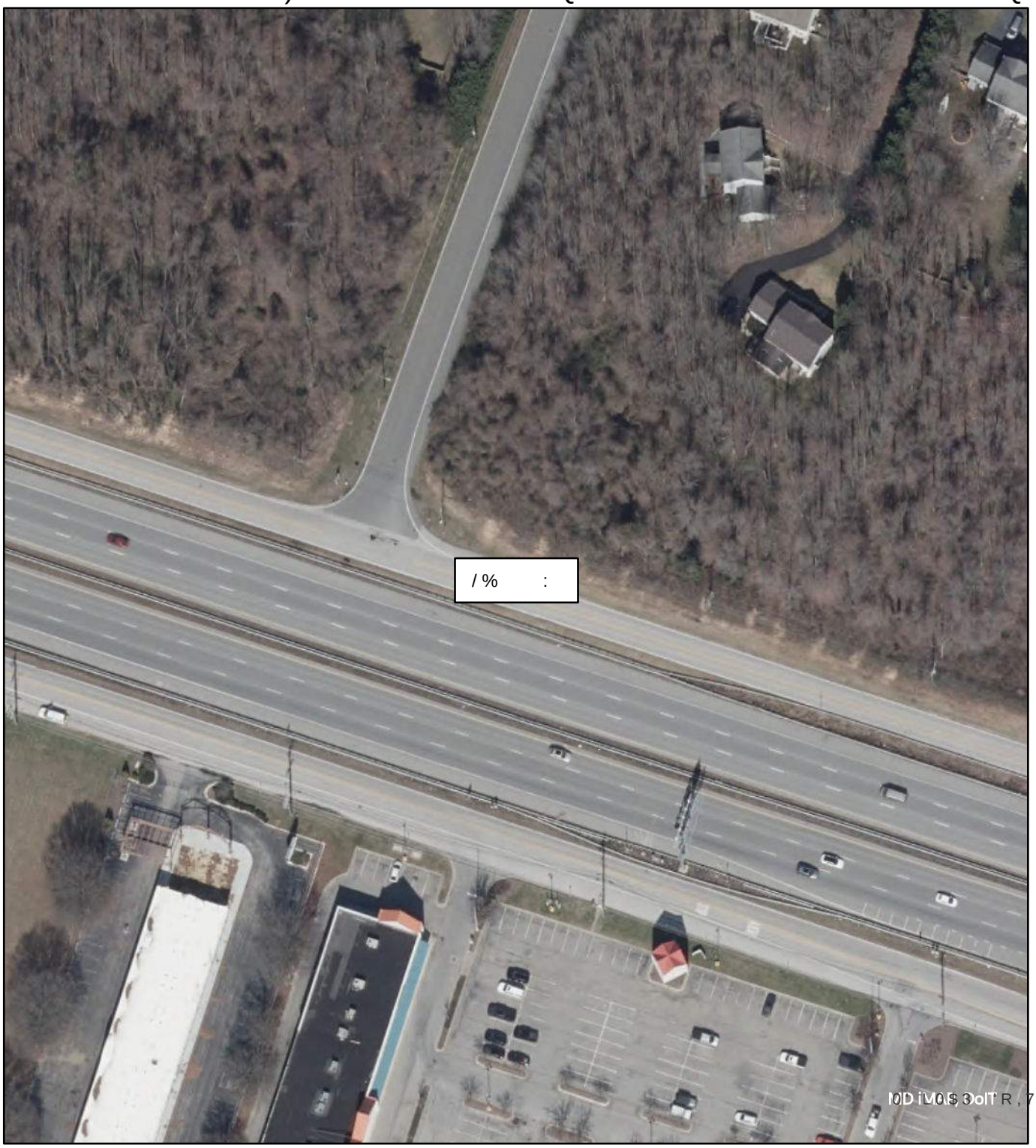
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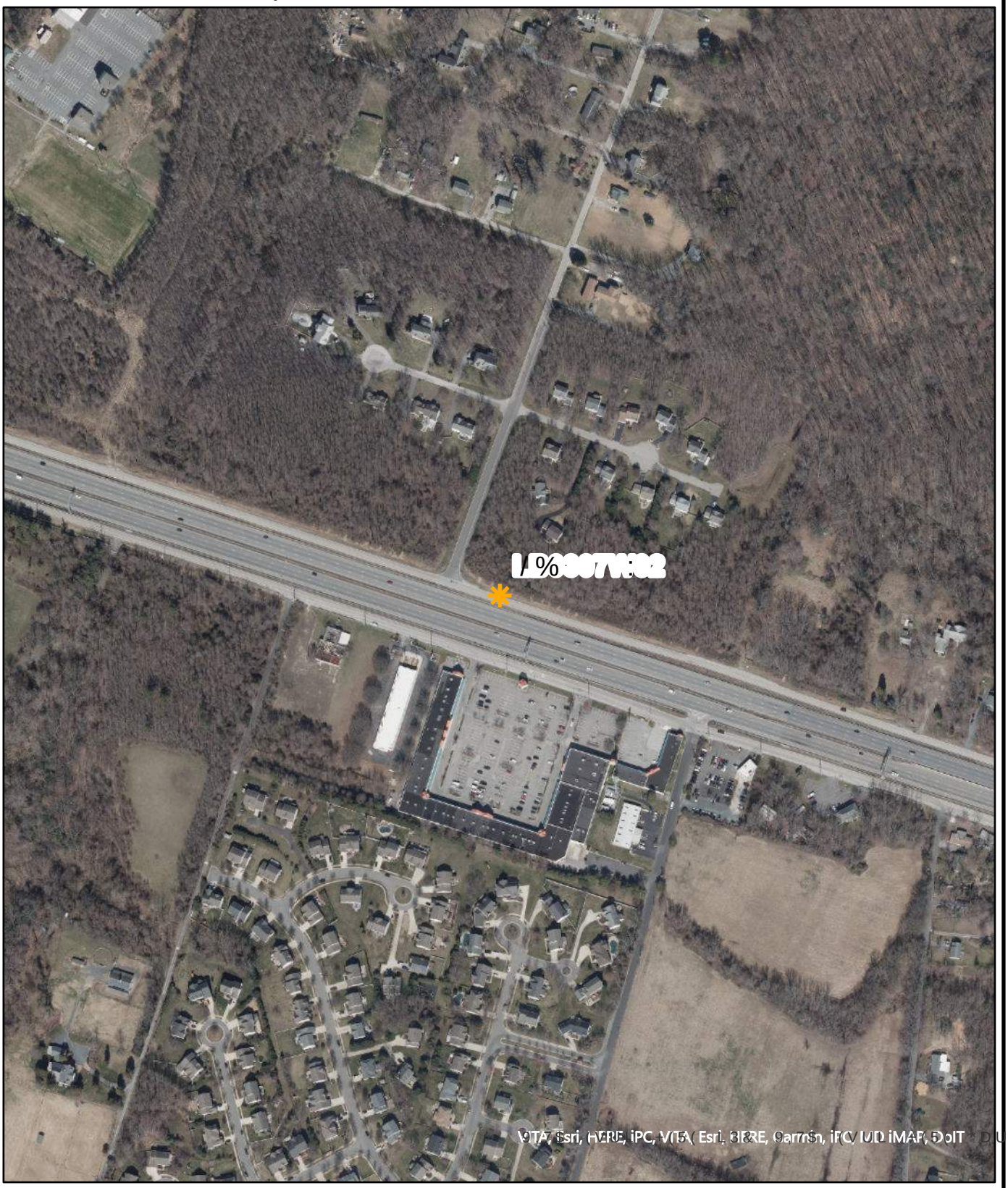
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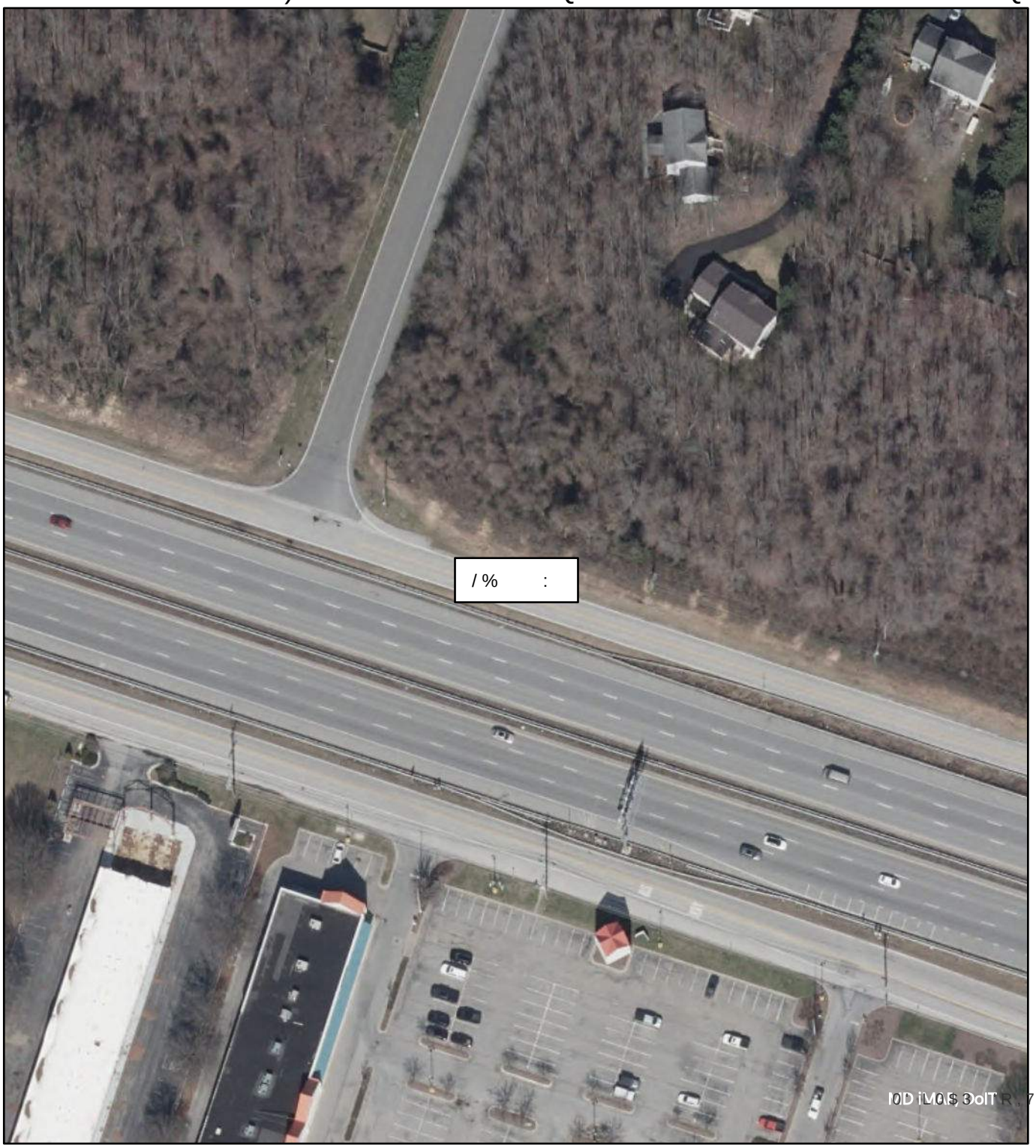
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Maryland Transportation Authority

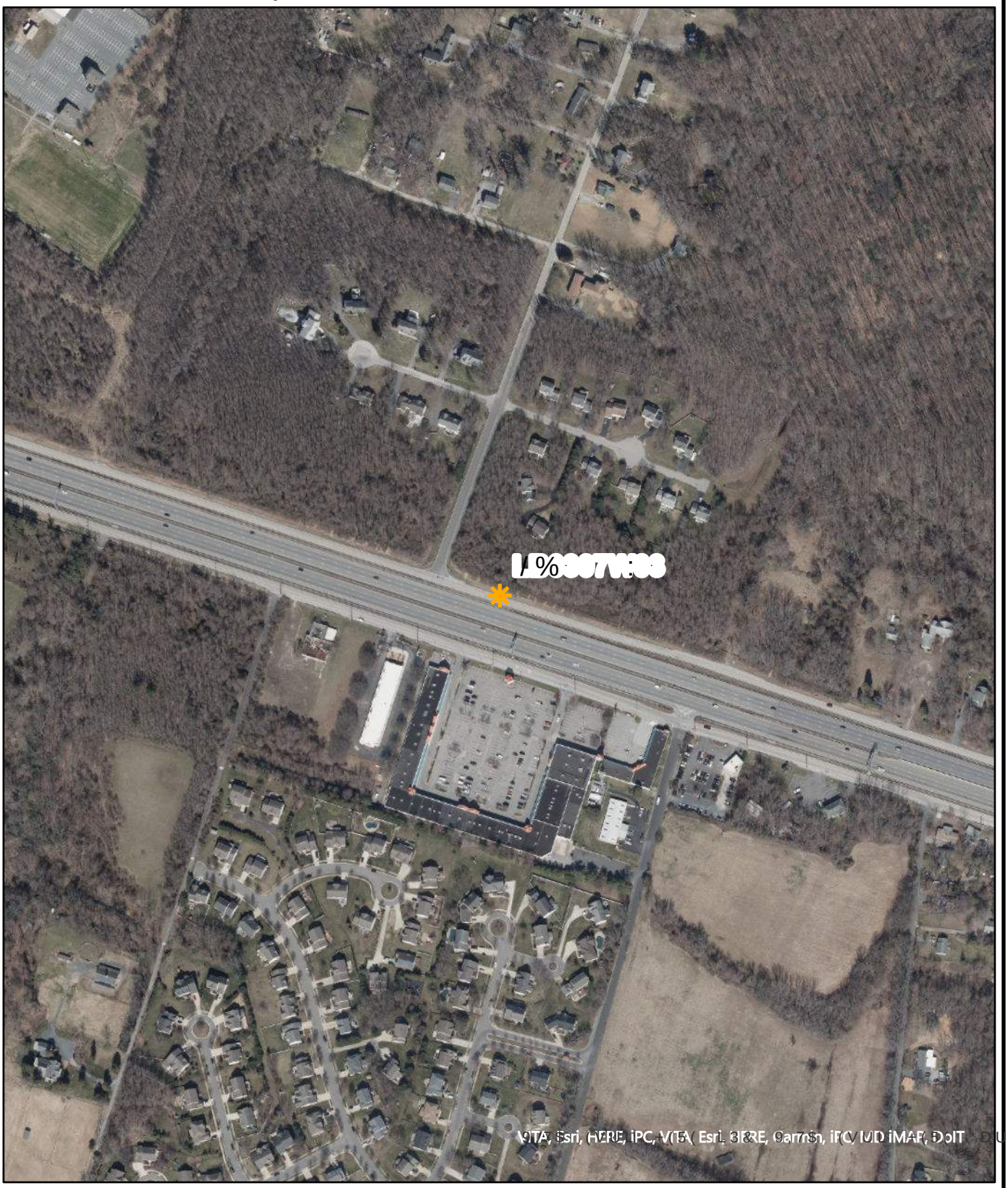
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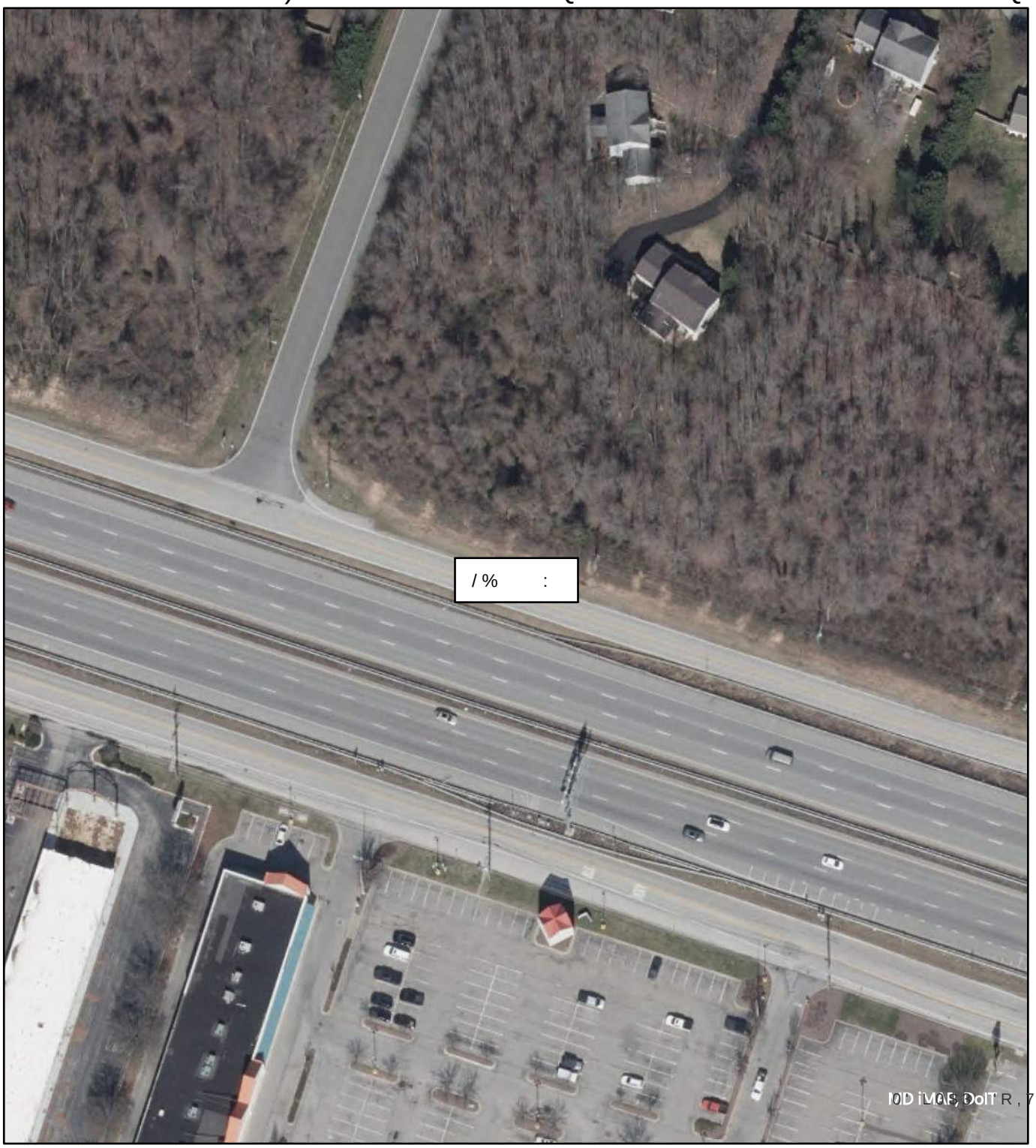
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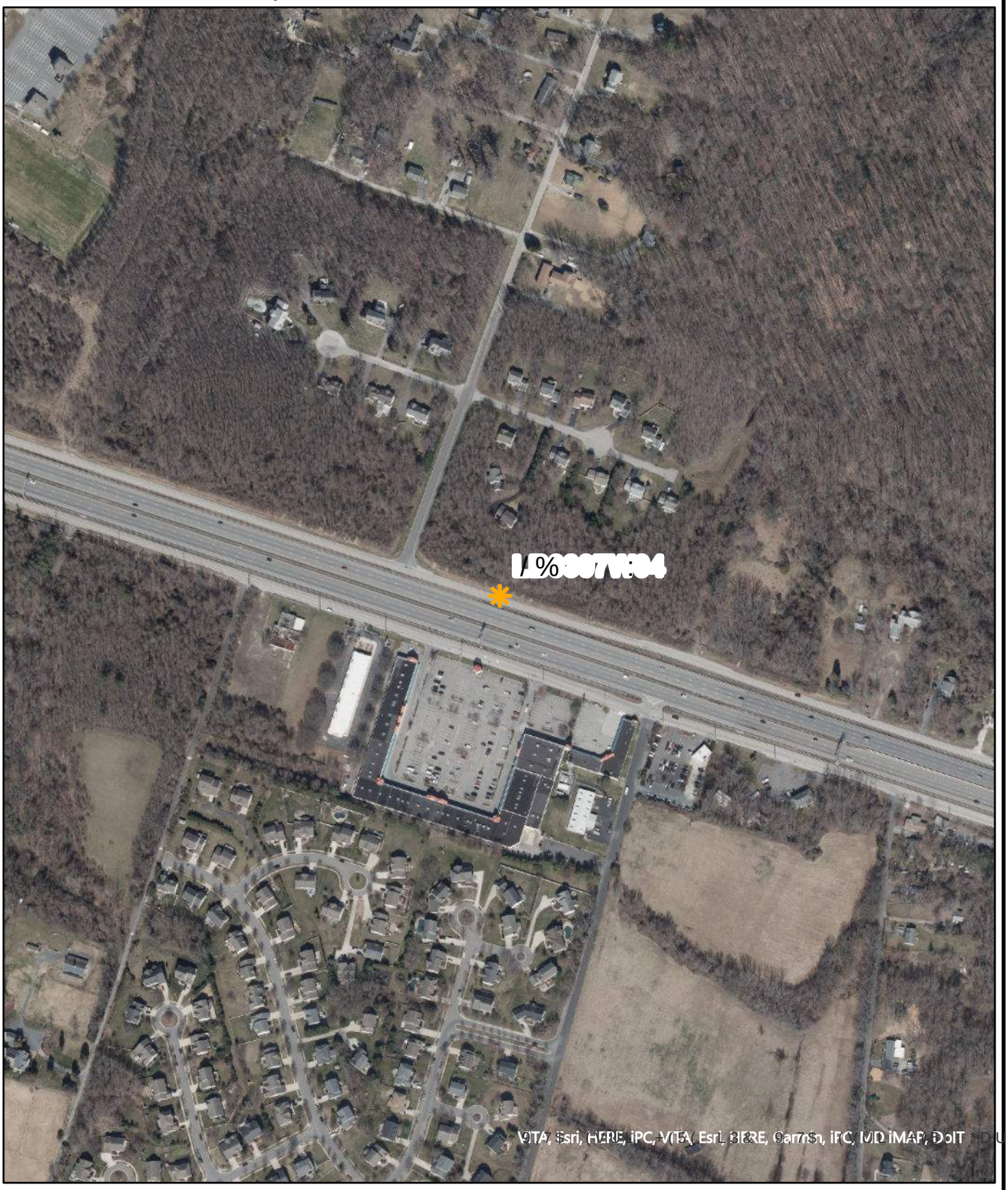
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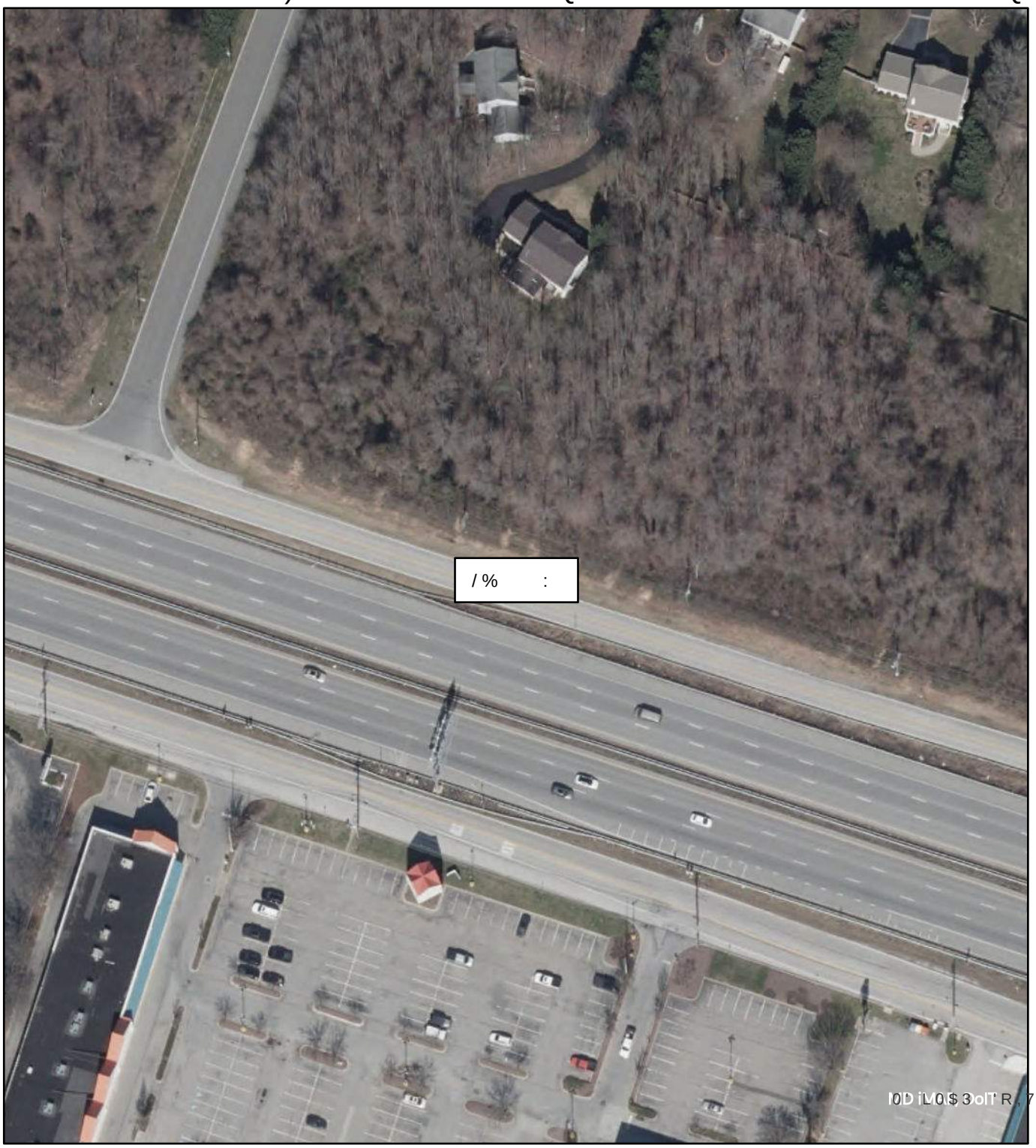
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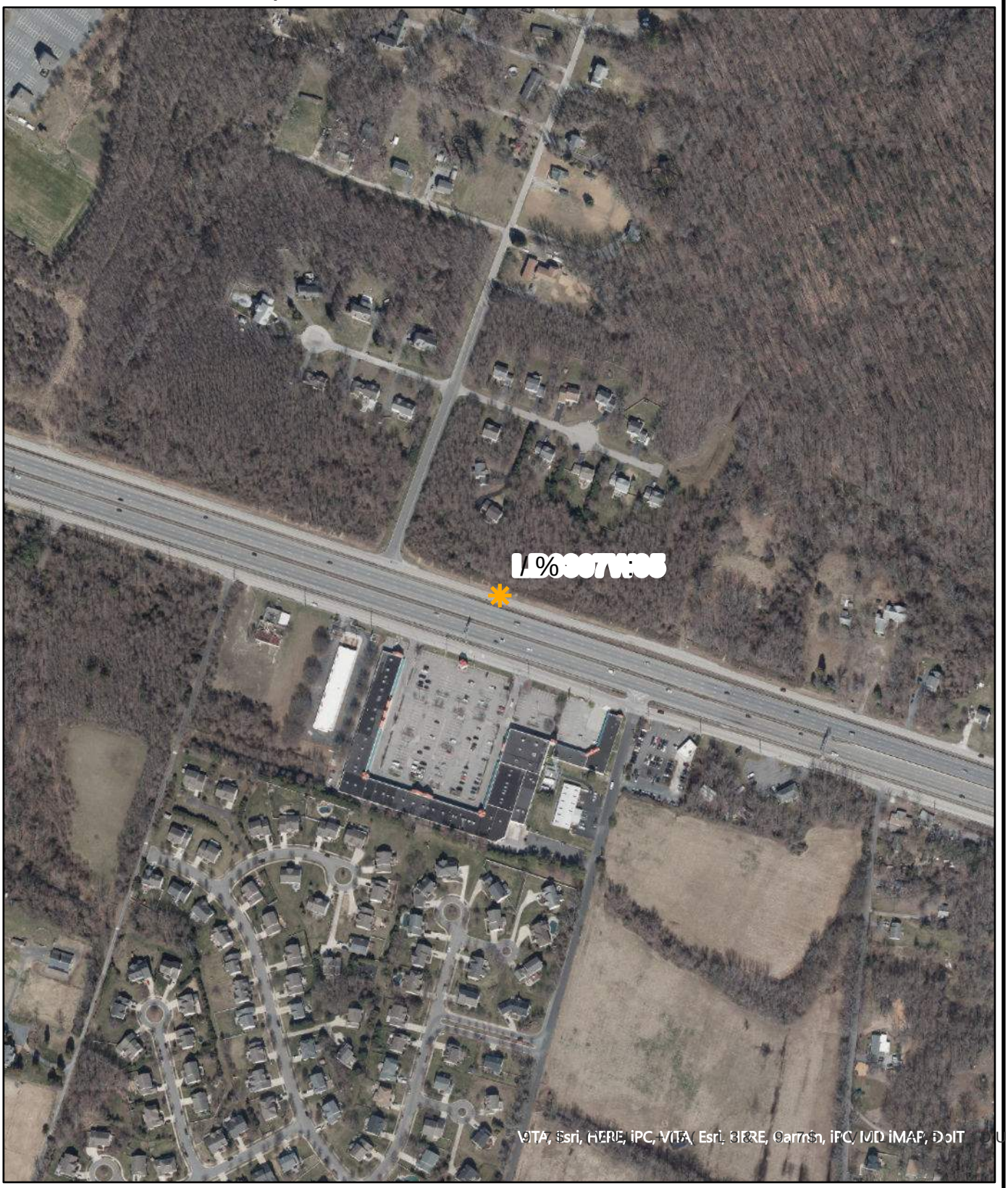
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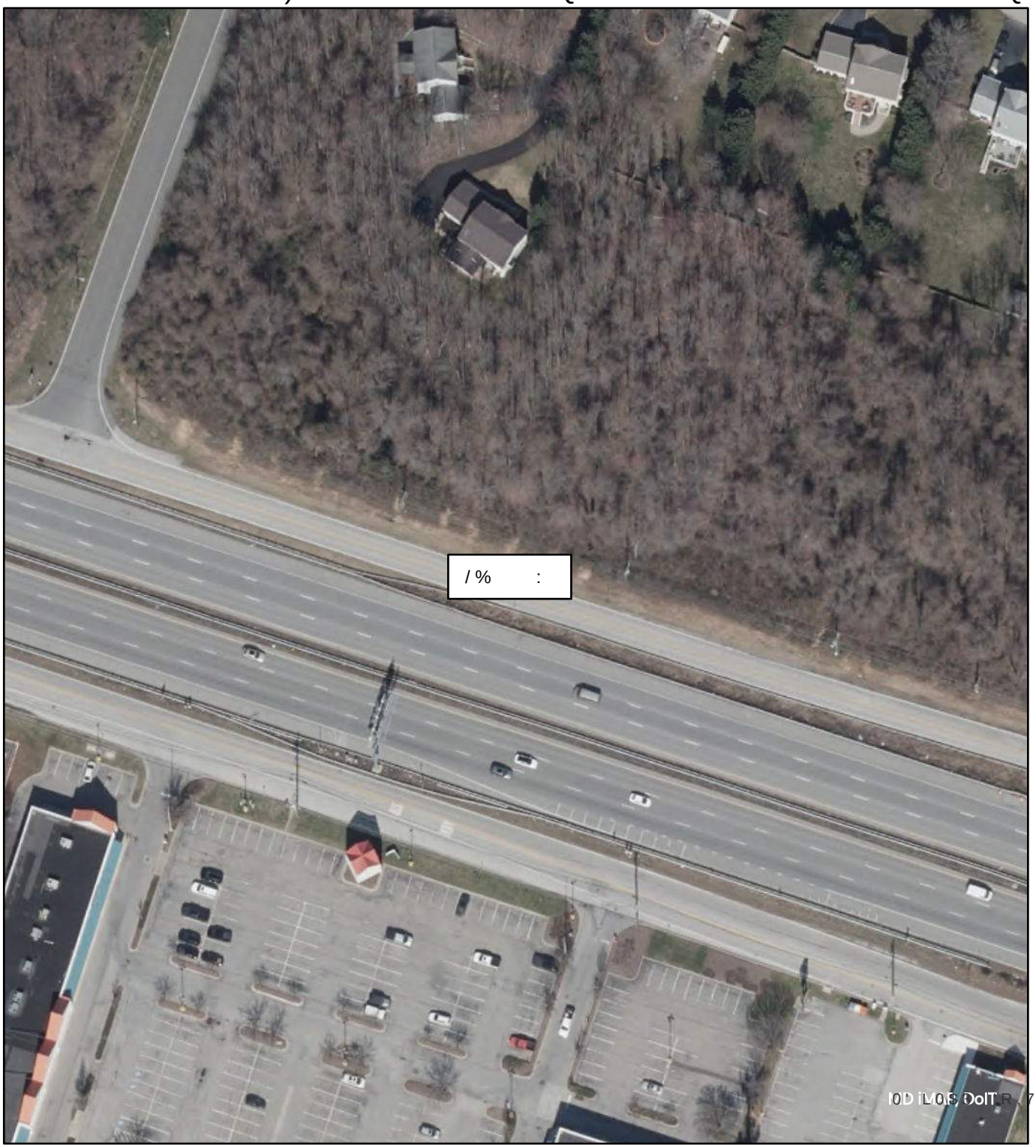
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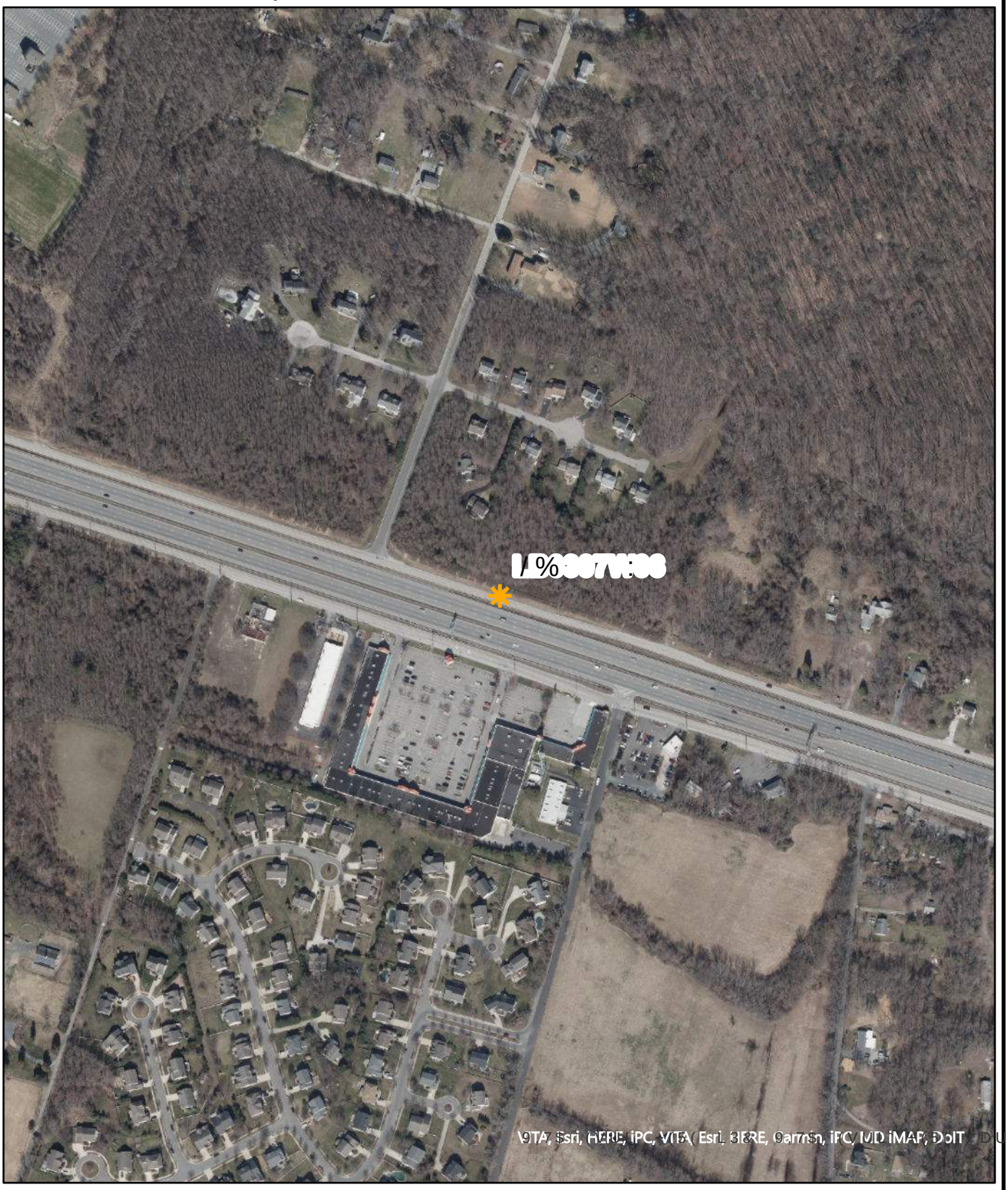
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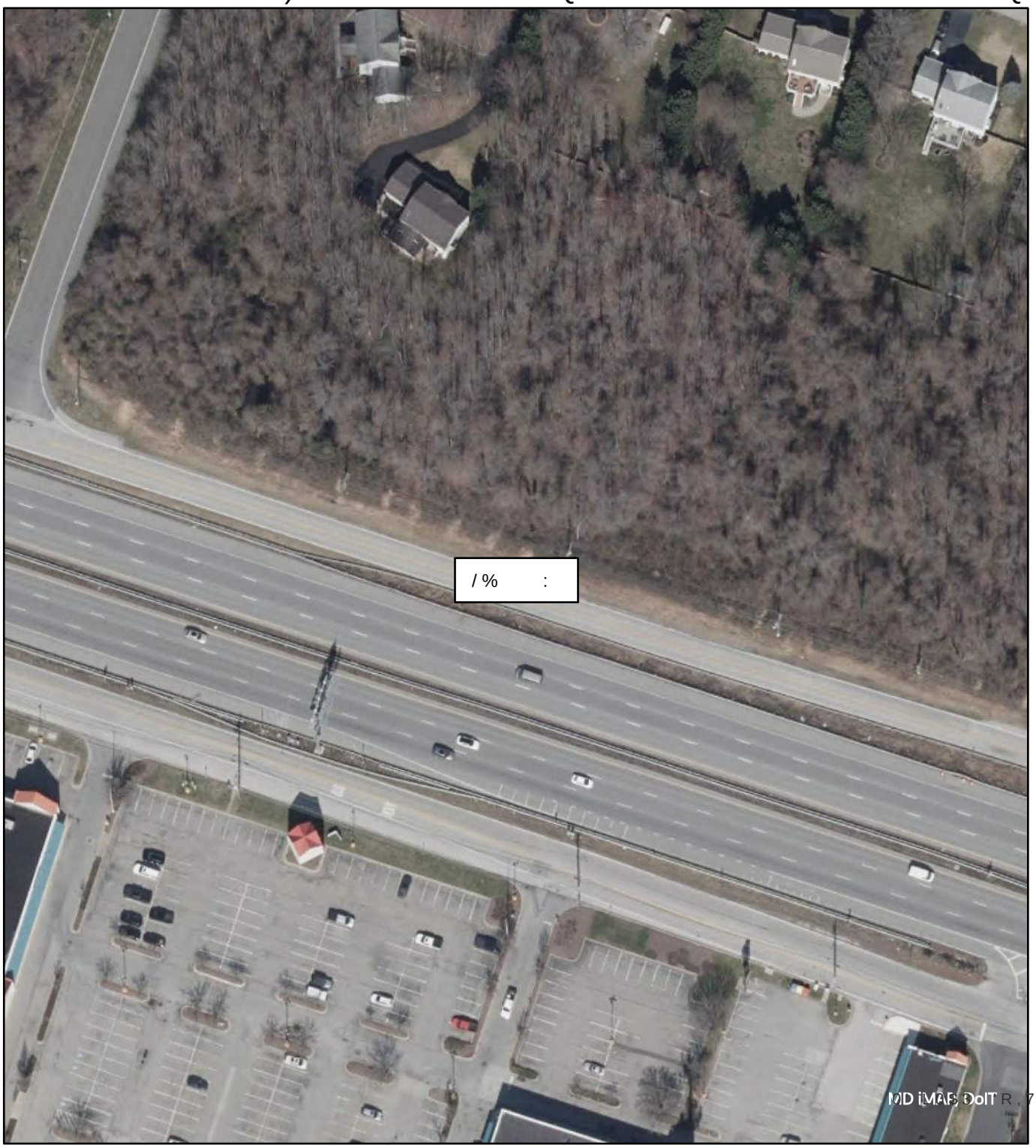
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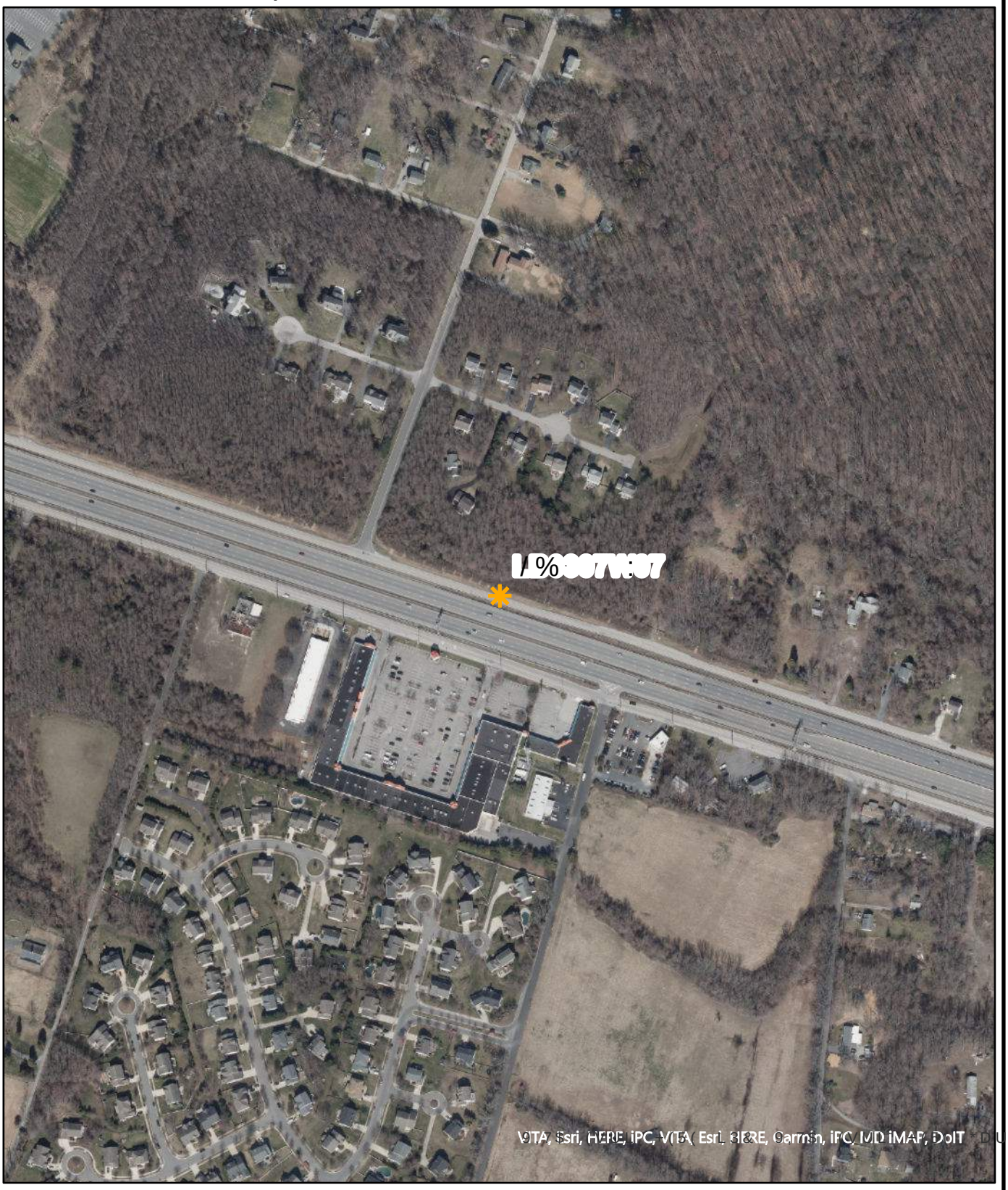
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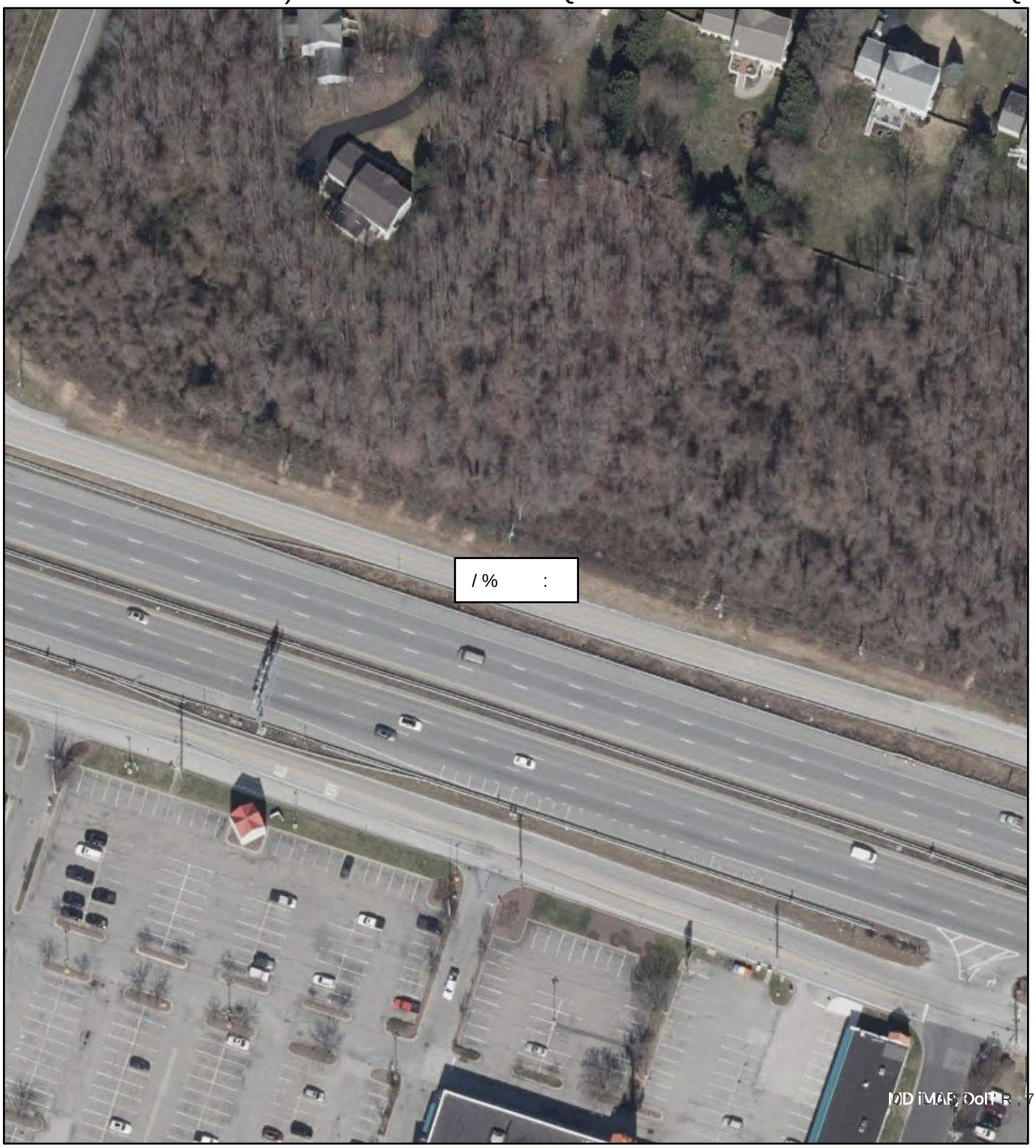
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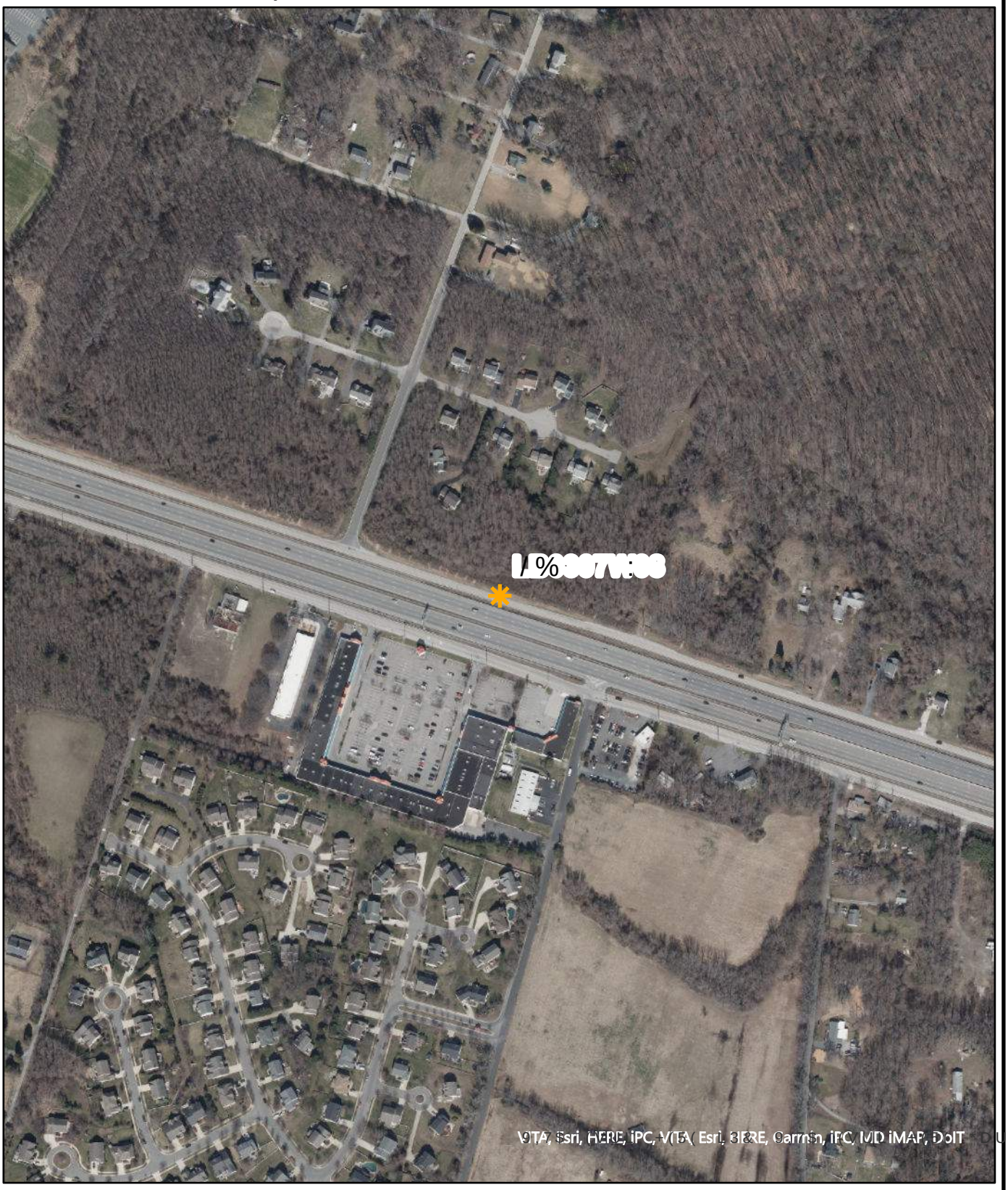
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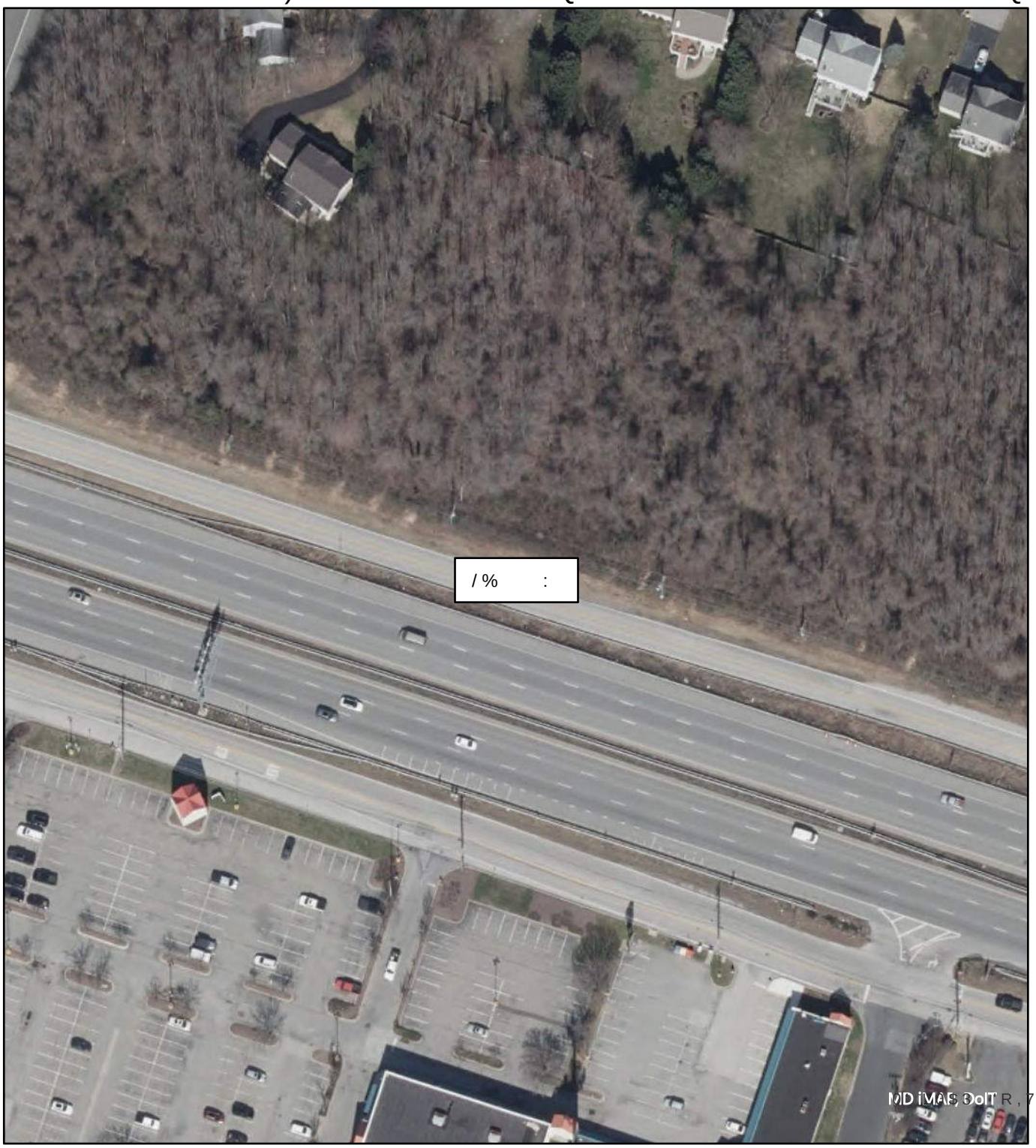
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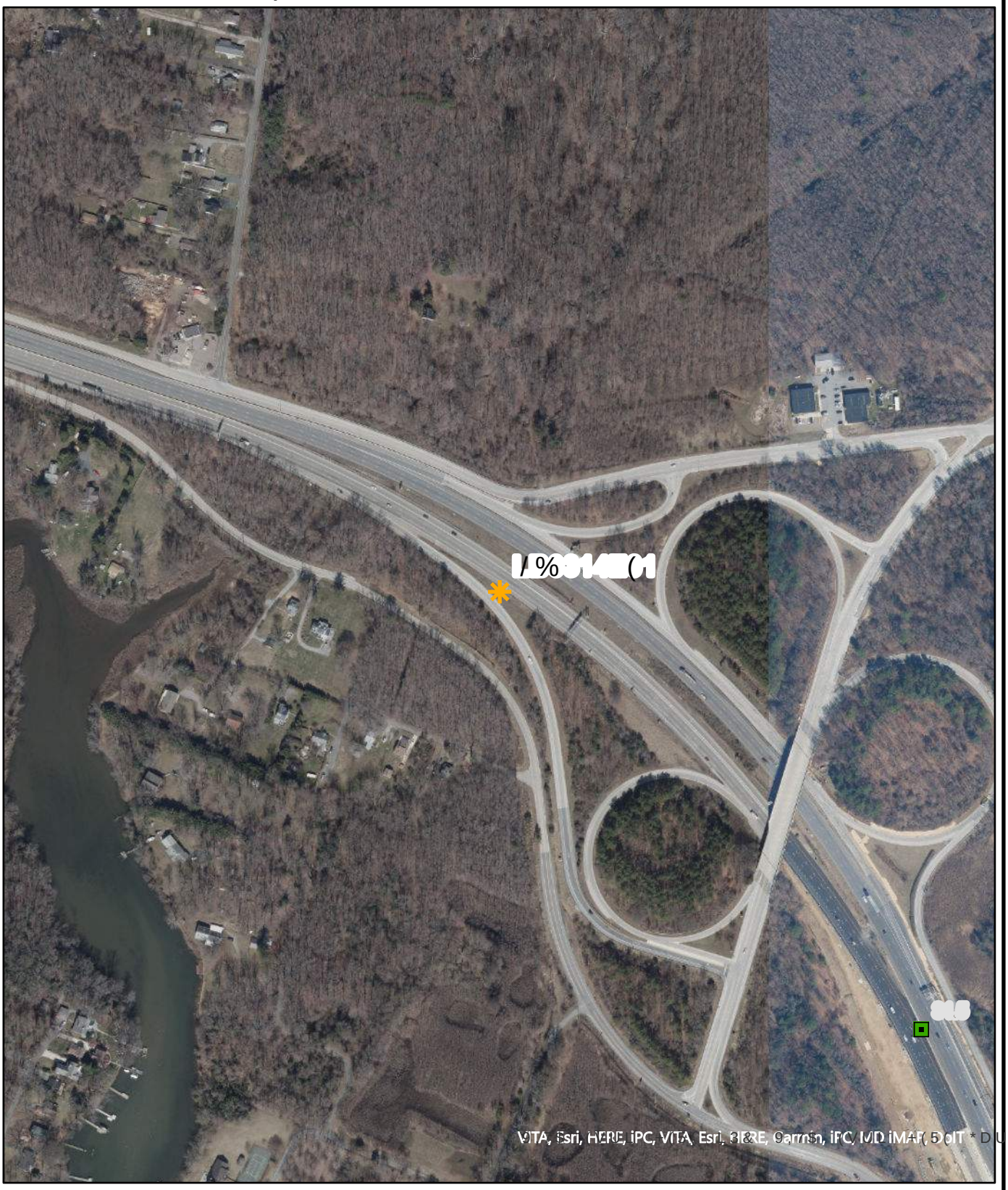
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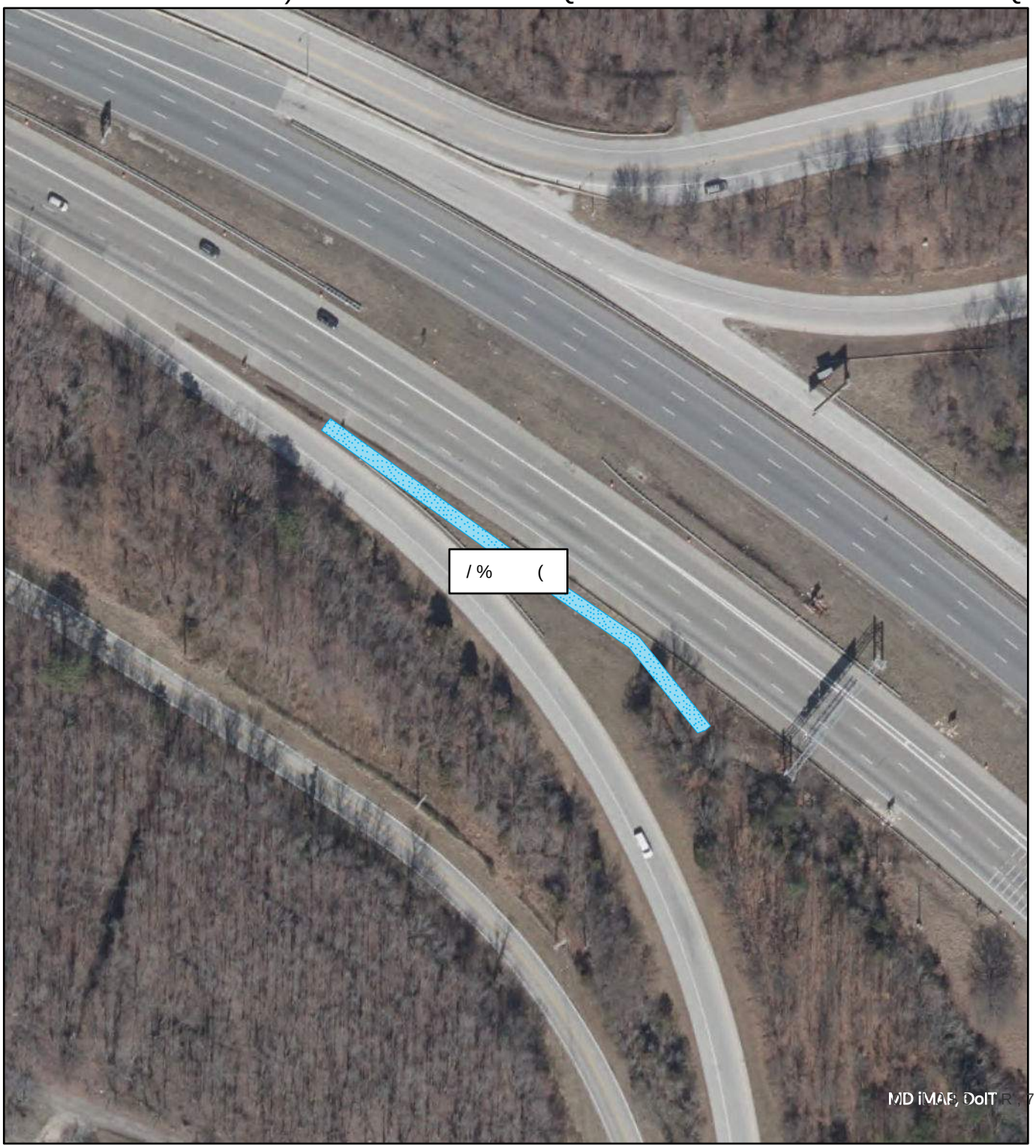
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6LWH 0DS /% (

%03 7\SH *UDVV 6ZDOH)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ
1 6:0 5LVHU
$:HLU
" (QG DQG +HDGZDOOV
3LSH &RQQHFWLRQ
$,QOHW
0DQKROH

%03 7<3(
)LOWHULQJ
+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRQ
2SHQ &KDQQHO 6\VWHP
%RG
:HWODQG

%03 *DWH
6WRUP 'UDLQ
\GUDXOLF &RQQHFWLRQ
$FFHVV WR W

Maryland Transportation Authority

0DS 3UHSDUHG 'DWD 6RXUFHV 0'7$ 13'6 'DWD %DVH 0DS (VUL ,PDJHU\

)HHW

Site Photos:

Photo Description:	Access
Photo Direction:	Looking downstream



Photo Description:	Treatment Area
Photo Direction:	Looking upstream



Photo Description:	Inflow
Photo Direction:	Looking upstream



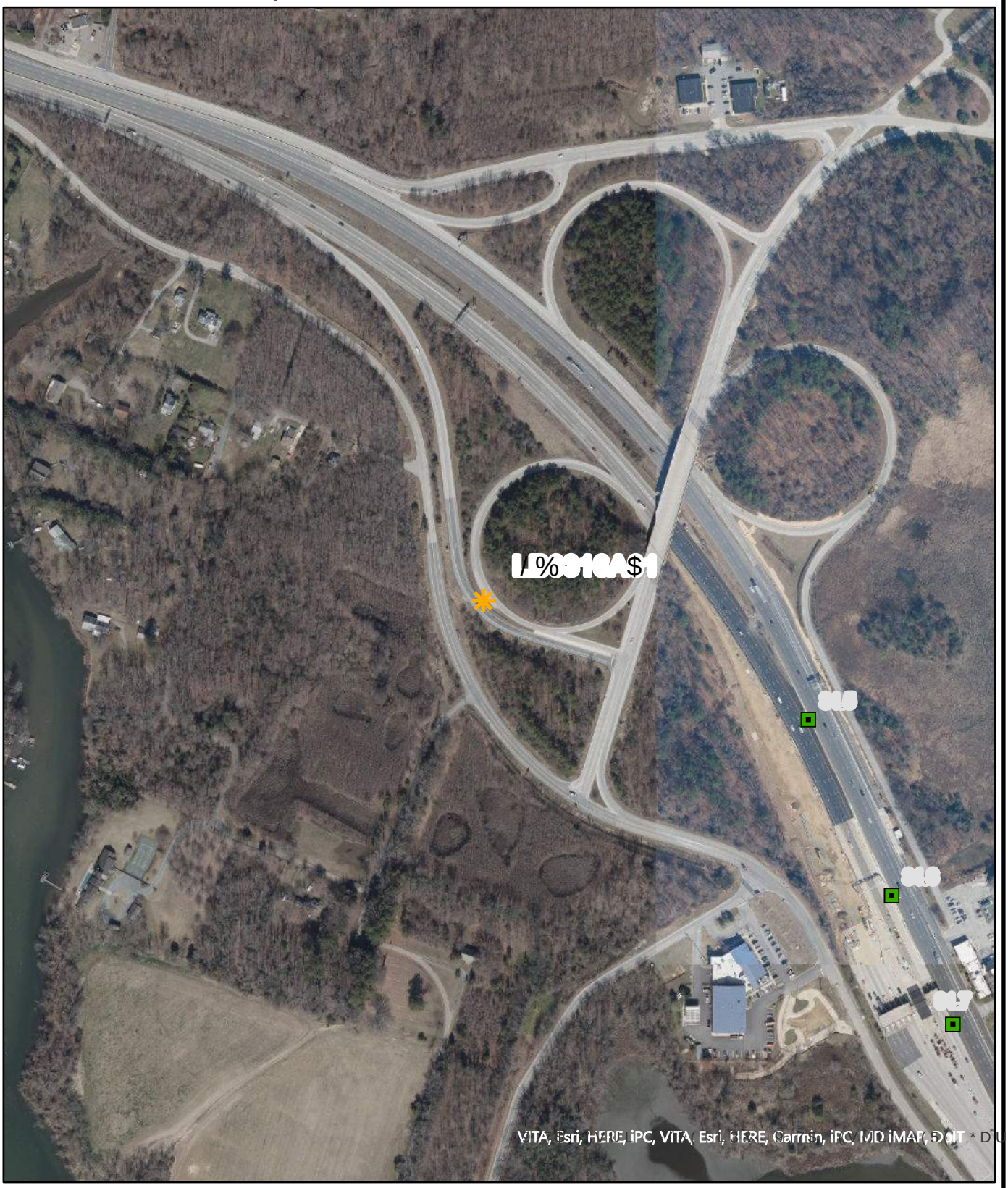
Photo Description:	Outfall
Photo Direction:	Looking downstream



9LFLQLW\ 0DS /% $

%03 7\SH *UDVV 6ZDOH

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

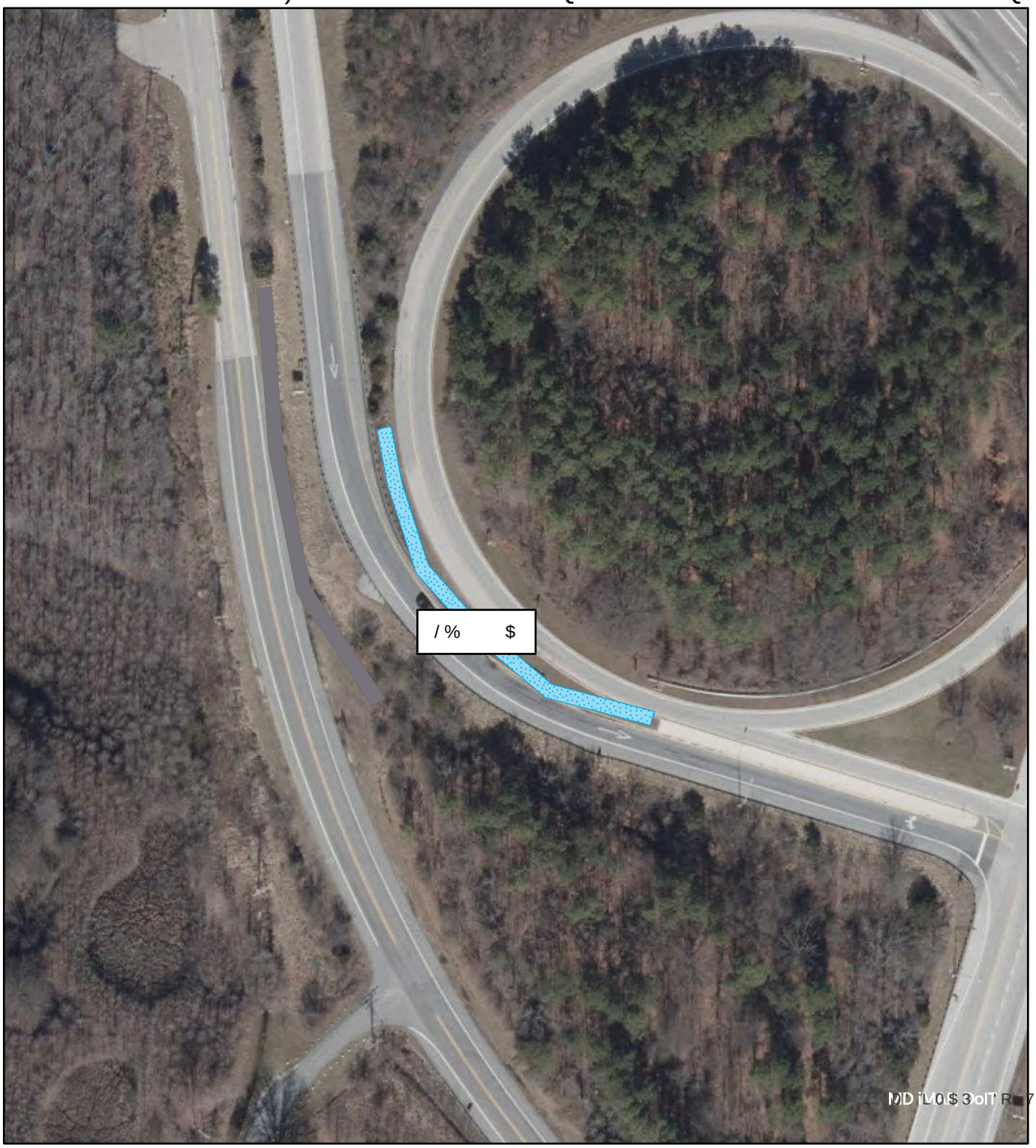
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%DVH 0DS (VUL ,PDJHU\

6LWH 0DS /% $

%03 7\SH *UDVV 6ZDOH)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ
1 6:0 5LVHU
$:HLU
" (QG DQG +HDGZDOOV
3LSH &RQQHFWLRQ
$,QOHW
0DQKROH

%03 7<3(
)LOWHULQJ
+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRQ
2SHQ &KDQQHO 6\VWHP
:HWODQG

Maryland Transportation Authority

0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'(6 'DWD
%DVH 0DS (VUL ,PDJHU\

)HHW

Site Photos:

Photo Description:	Access
Photo Direction:	Looking upstream



Photo Description:	Inflow
Photo Direction:	Looking downstream



Photo Description:	Treatment Area
Photo Direction:	Looking upstream



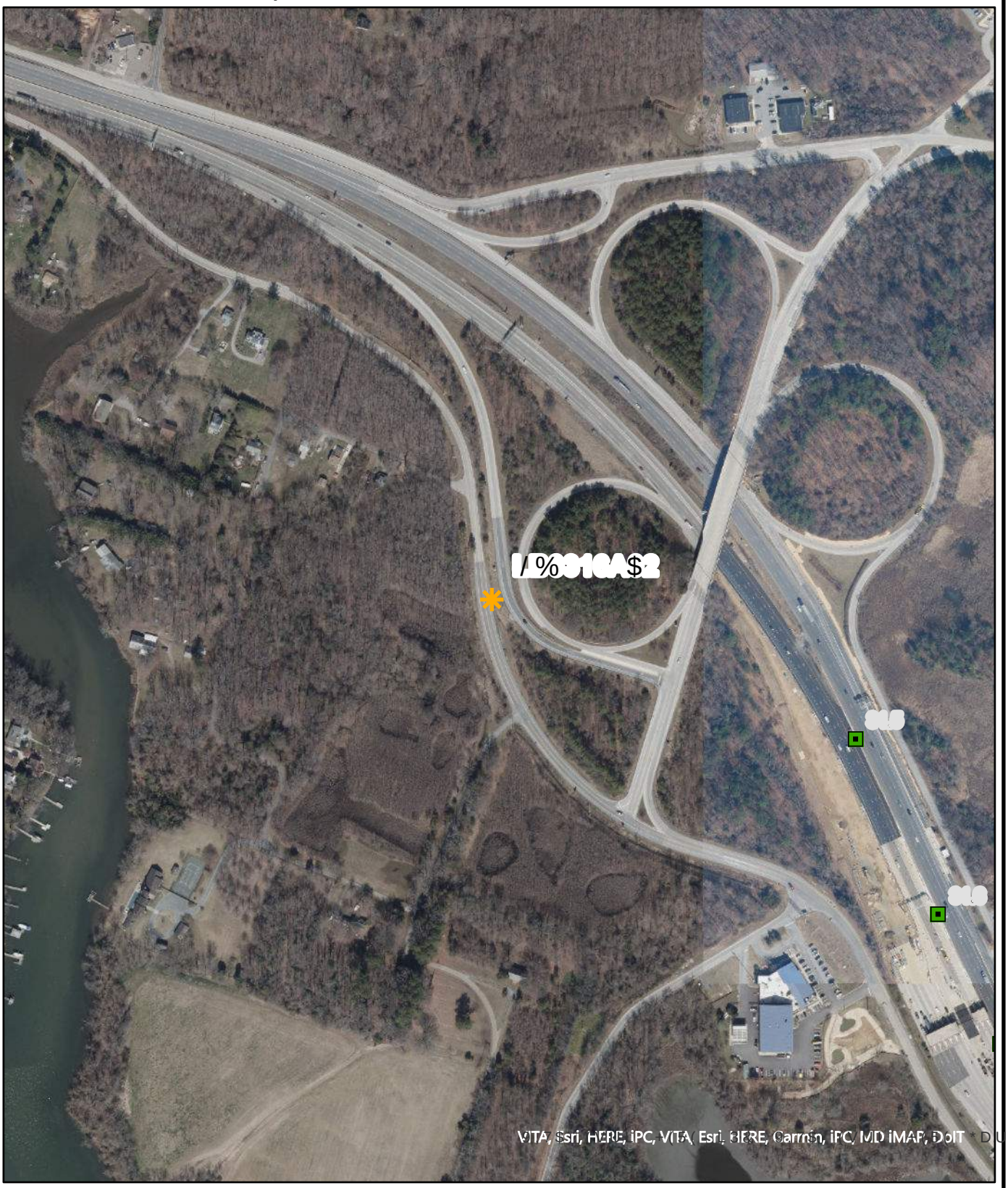
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Photo Direction:	Looking downstream



9LFLQLW\ 0DS /% $

%03 7\SH *UDVV 6ZDOH

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

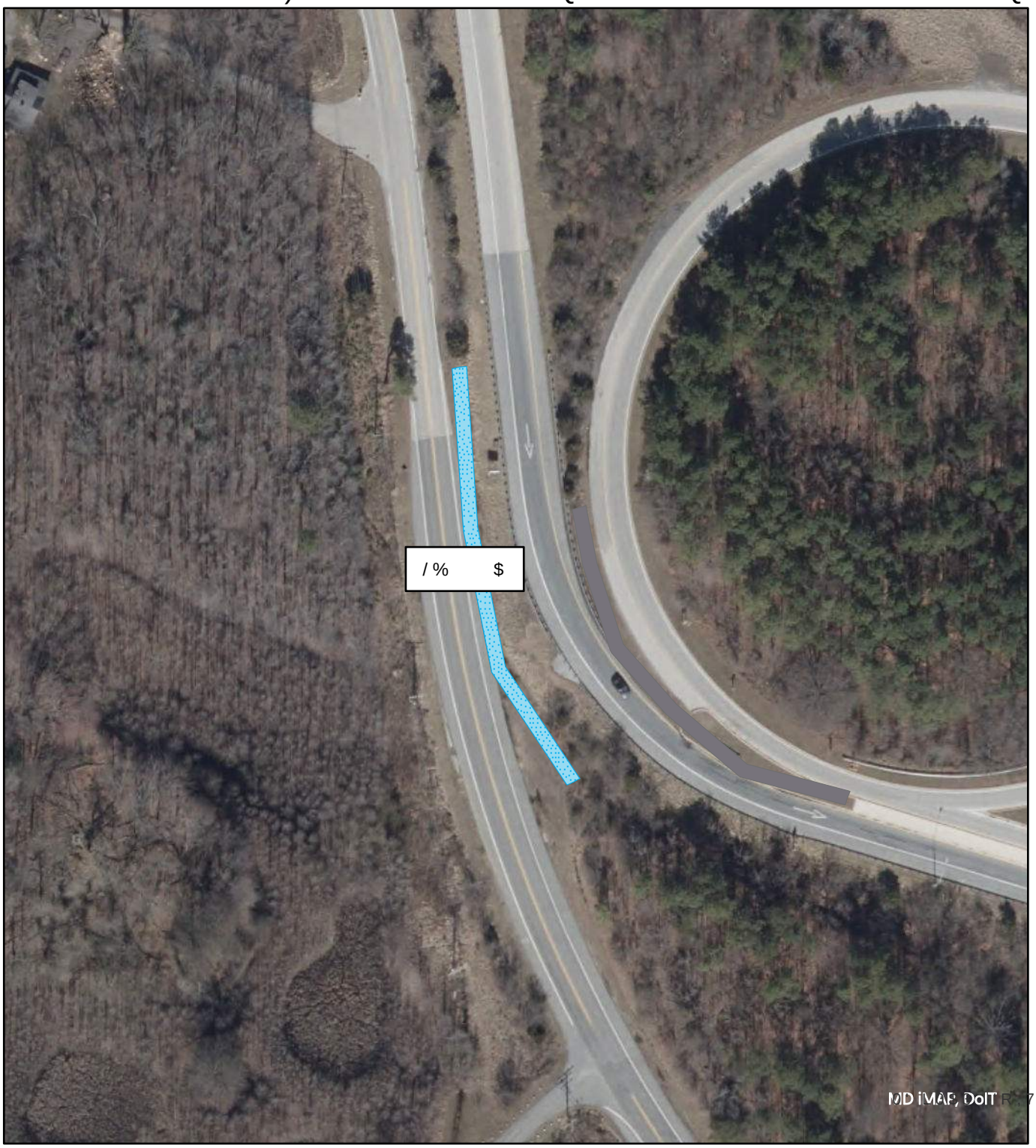
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%DVH 0DS (VUL ,PDJHU\

k

6LWH 0DS /% $

%03 7\SH *UDVV 6ZDOH)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ
1 6:0 5LVHU
$:HLU
" (QG DQG +HDGZDOOV
3LSH &RQQHFWLRQ
$,QOHW
0DQKROH
%03 7<3(
)LOWHULQJ
+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRQ
2SHQ &KDQQHO 6\VWHP
%RG
:HWODQG
%03 *DWH
6WRUP 'UDLQ
$FFHVV WR W %RG

Maryland Transportation Authority

0DS 3UHSDUHG 'DWD 6RXUFHV 0'7$ 13'6 'DWD %DVH 0DS (VUL ,PDJHU\

)HHW

Site Photos:

Photo Description:	Inflow
Photo Direction:	Looking downstream



Photo Description:	Access
Photo Direction:	Looking upstream



Photo Description:	Outfall
Photo Direction:	



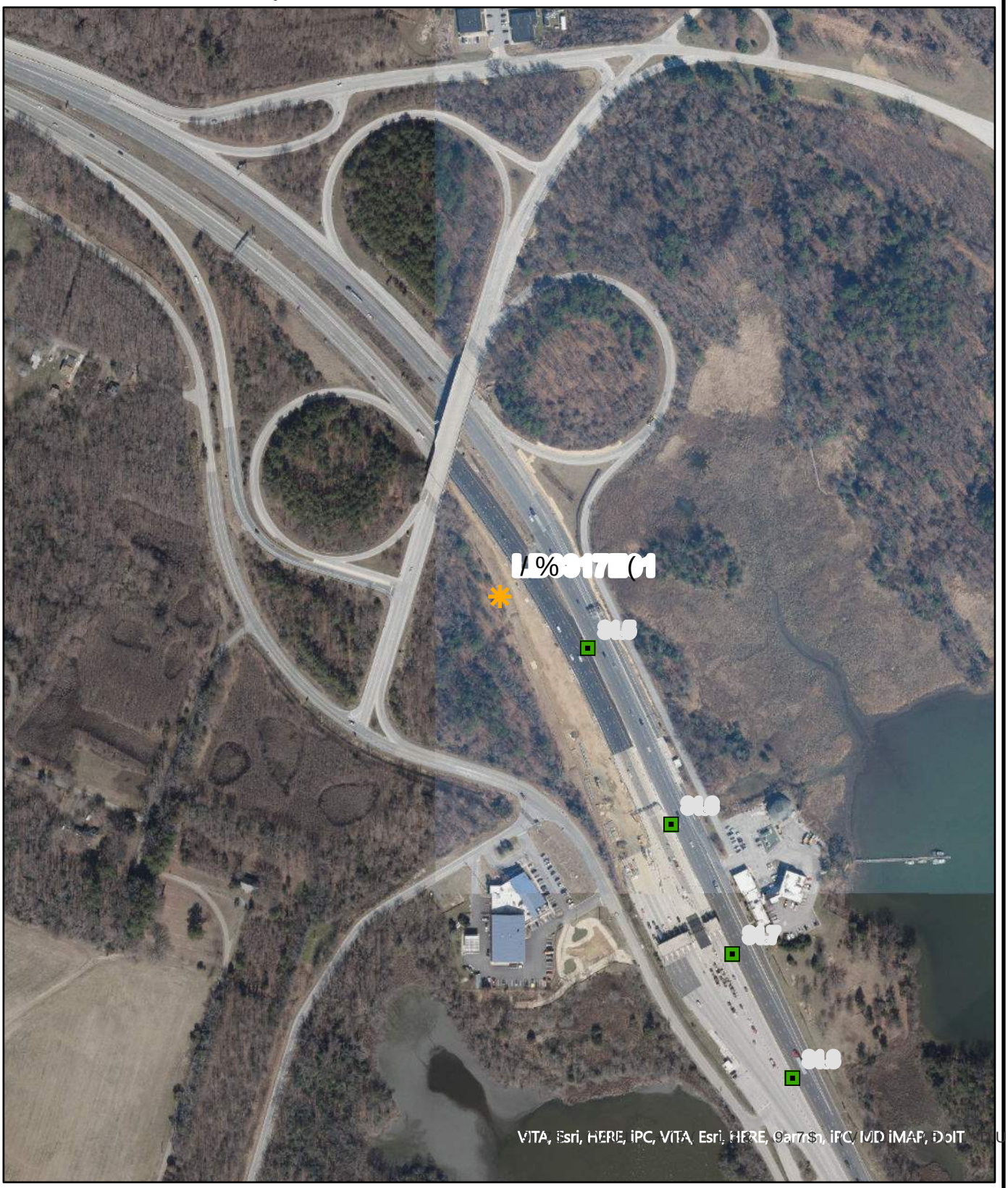
Photo Description:	Treatment Area
Photo Direction:	Looking upstream



9LFLQLW\ 0DS /% (

%03 7\SH *UDVV &KDQQHO

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

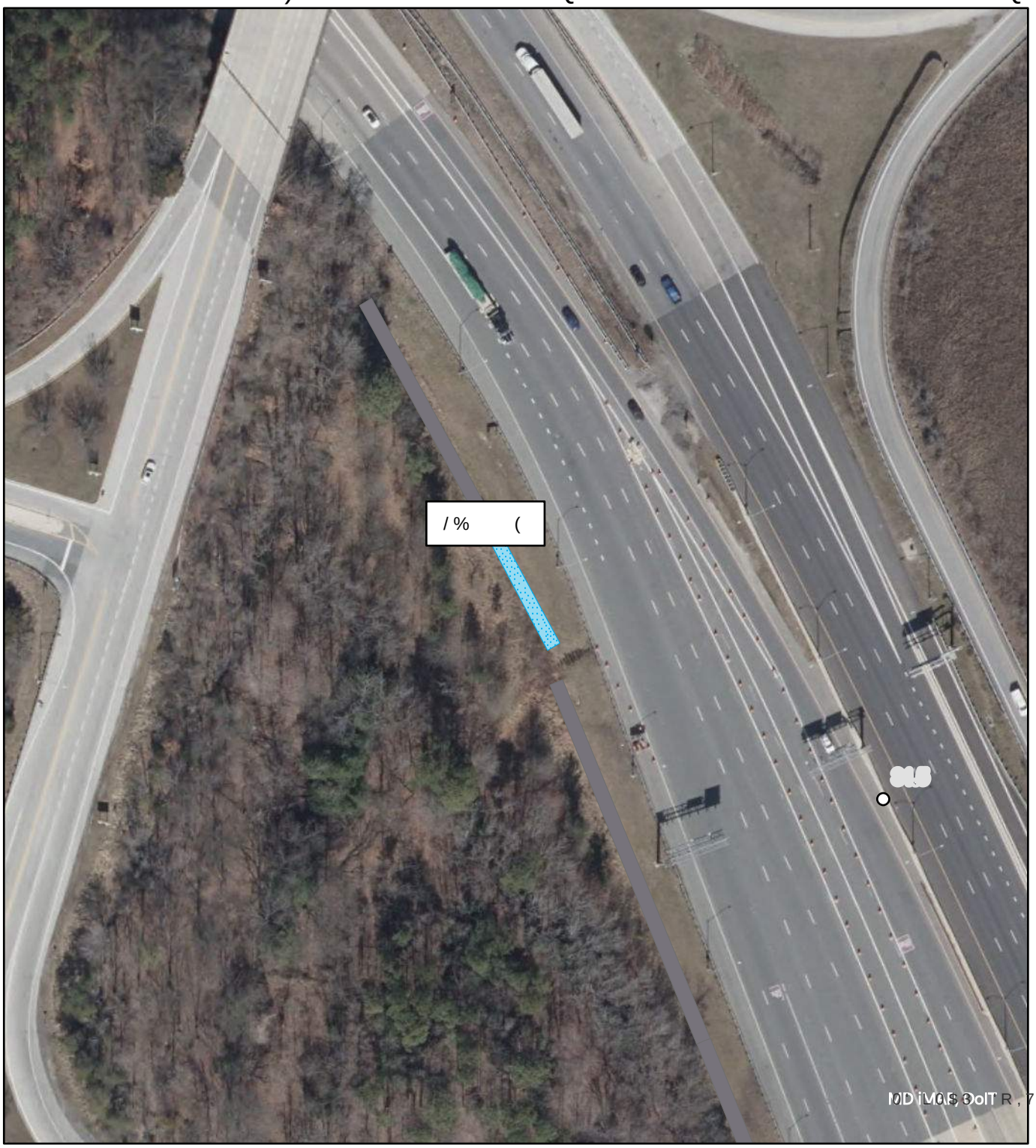
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%DVH 0DS (VUL ,PDJHU\

k

6LWH 0DS /% (

%03 7\SH *UDVV &KDQQHO)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWW@U3DUNLQJ %03 7<3(
1 6:0 5LVHU @%03 *DWH)LOWHULQJ
$:HLU 6WRUP 'UDLQ +\GURG\QDPLF 6WUXFWXUHV
" (QG DQG +HDGZDOOV ,QILOWUDWLRQ
3LSH &RQQHFWLRQ +\GUDXOLF &RQQHFWLRQ 2SHQ &KDQQHO 6\VWHP
$,QOHW $FFHVV WR W %RQG
0DQKROH :HWODQG

)HHW

Maryland Transportation Authority

0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'(6 'DWD
%DVH 0DS (VUL ,PDJHU\

Site Photos:

Photo Description:	Access
Photo Direction:	Looking upstream



Photo Description:	Outfall
Photo Direction:	Looking downstream



Photo Description:	Treatment Area
Photo Direction:	Looking upstream



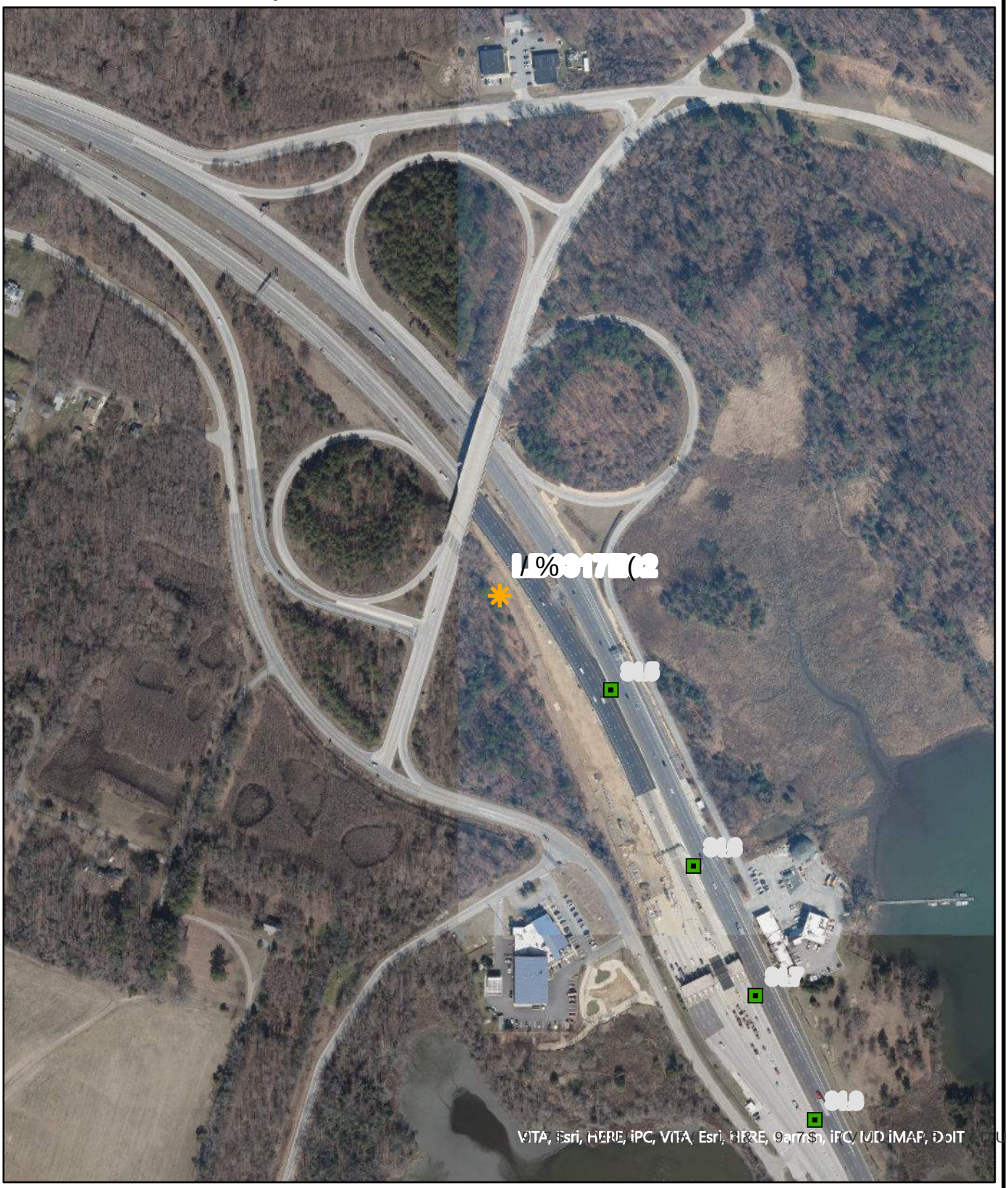
Photo Description:	Inflow
Photo Direction:	



9LFLQLW\ 0DS /% (

%03 7\SH *UDVV &KDQQHO

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

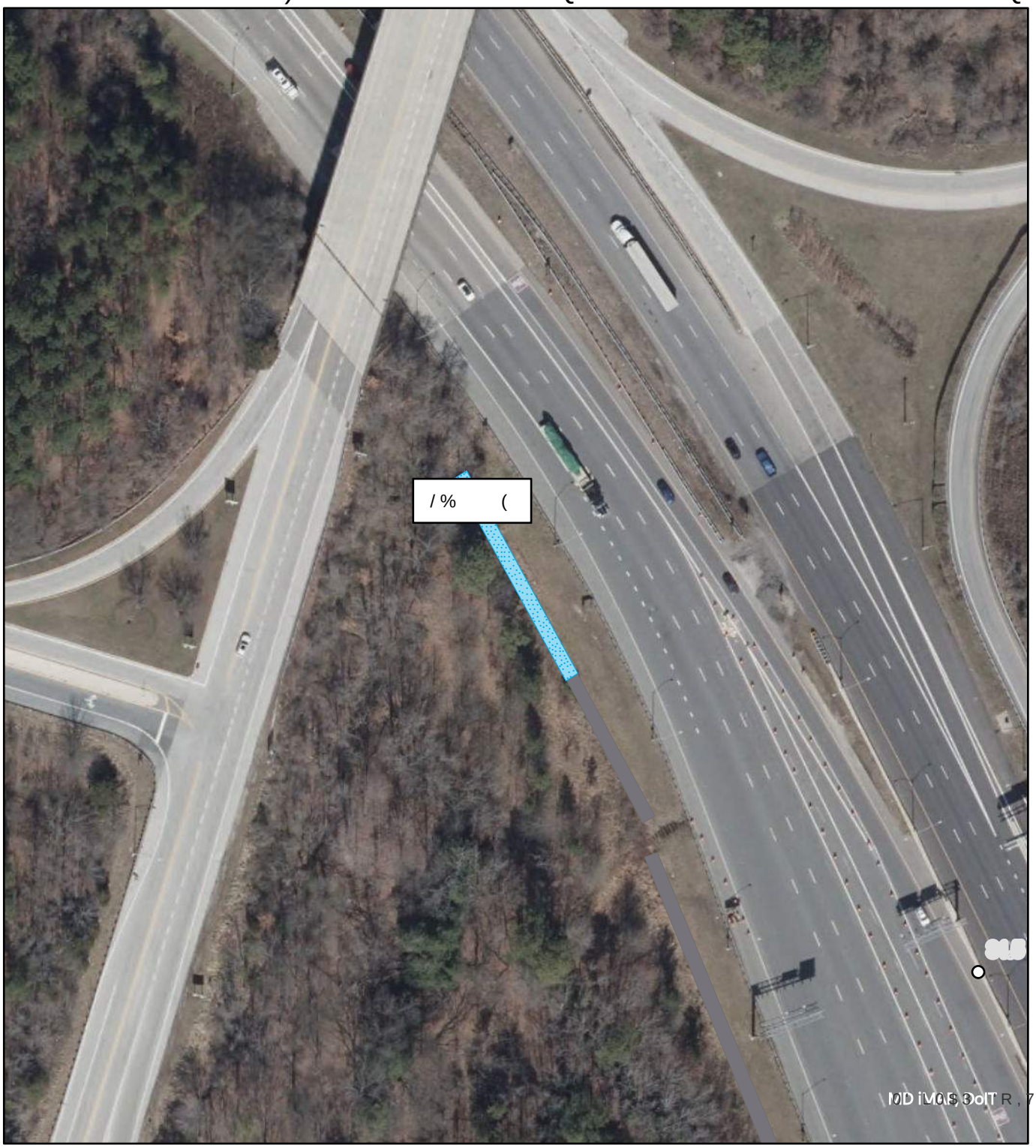
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%DVH 0DS (VUL ,PDJHU\

k

6LWH 0DS /% (

%03 7\SH *UDVV &KDQQHO)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ %03 7<3(
1 6:0 5LVHU @ %03 *DWH)LOWHULQJ
$:HLU 6WRUP 'UDLQ +\GURG\QDPLF 6WUXFWXUHV
" (QG DQG +HDGZDOOV ,QILOWUDWLRQ
3LSH &RQQHFWLRQ +\GUDXOLF &RQQHFWLRQ 2SHQ &KDQQHO 6\VWHP
$,QOHW $FFHVV WR W %RQG
0DQKROH :HWODQG

Maryland Transportation Authority

0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'(6 'DWD
%DVH 0DS (VUL ,PDJHU\

)HHW

Site Photos:

Photo Description:	Access
Photo Direction:	Looking upstream



Photo Description:	Outfall
Photo Direction:	Looking downstream



Photo Description:	Inflow
Photo Direction:	Looking upstream



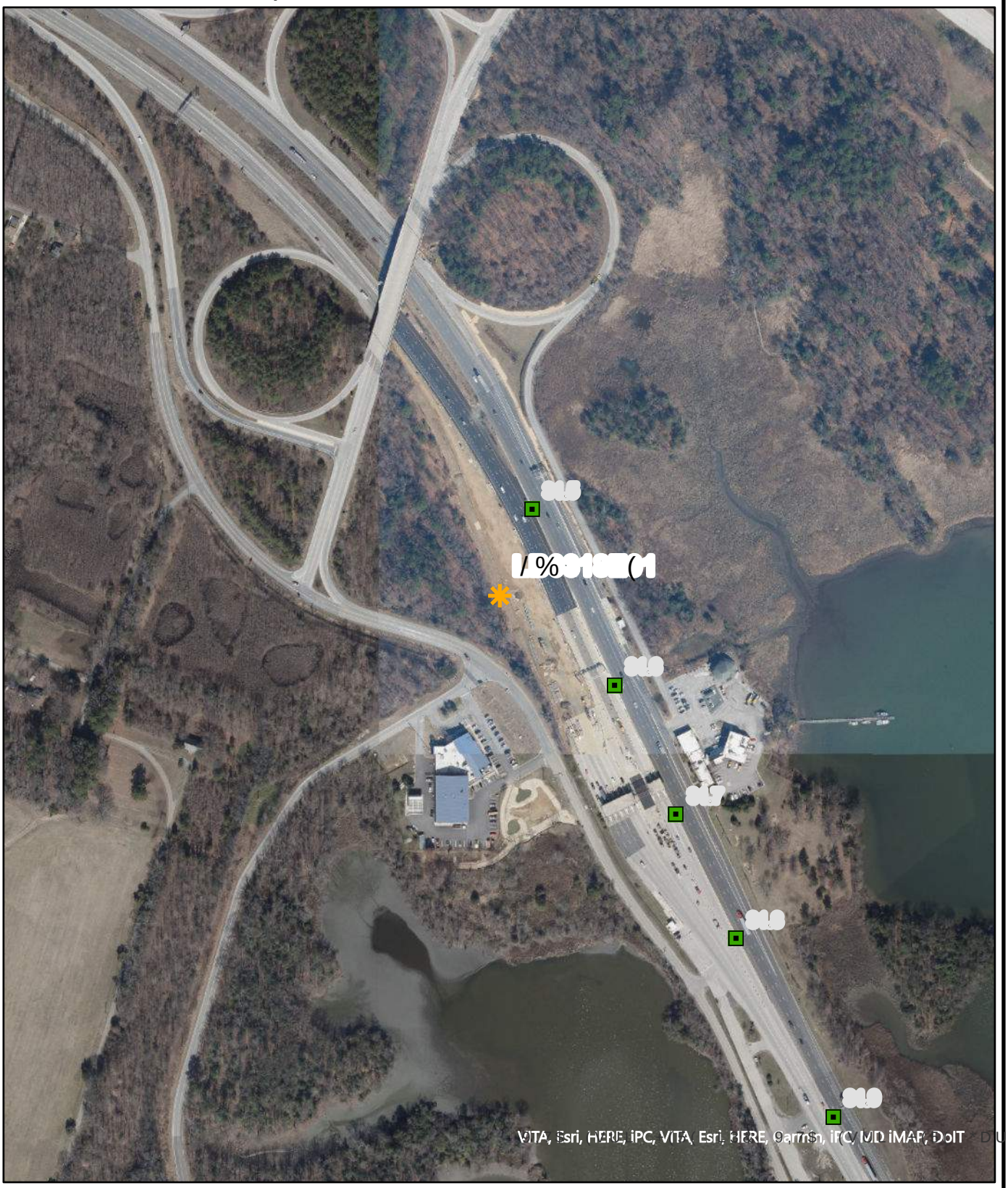
Photo Description:	Treatment Area
Photo Direction:	Looking upstream



9LFLQLW\ 0DS /% (

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Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

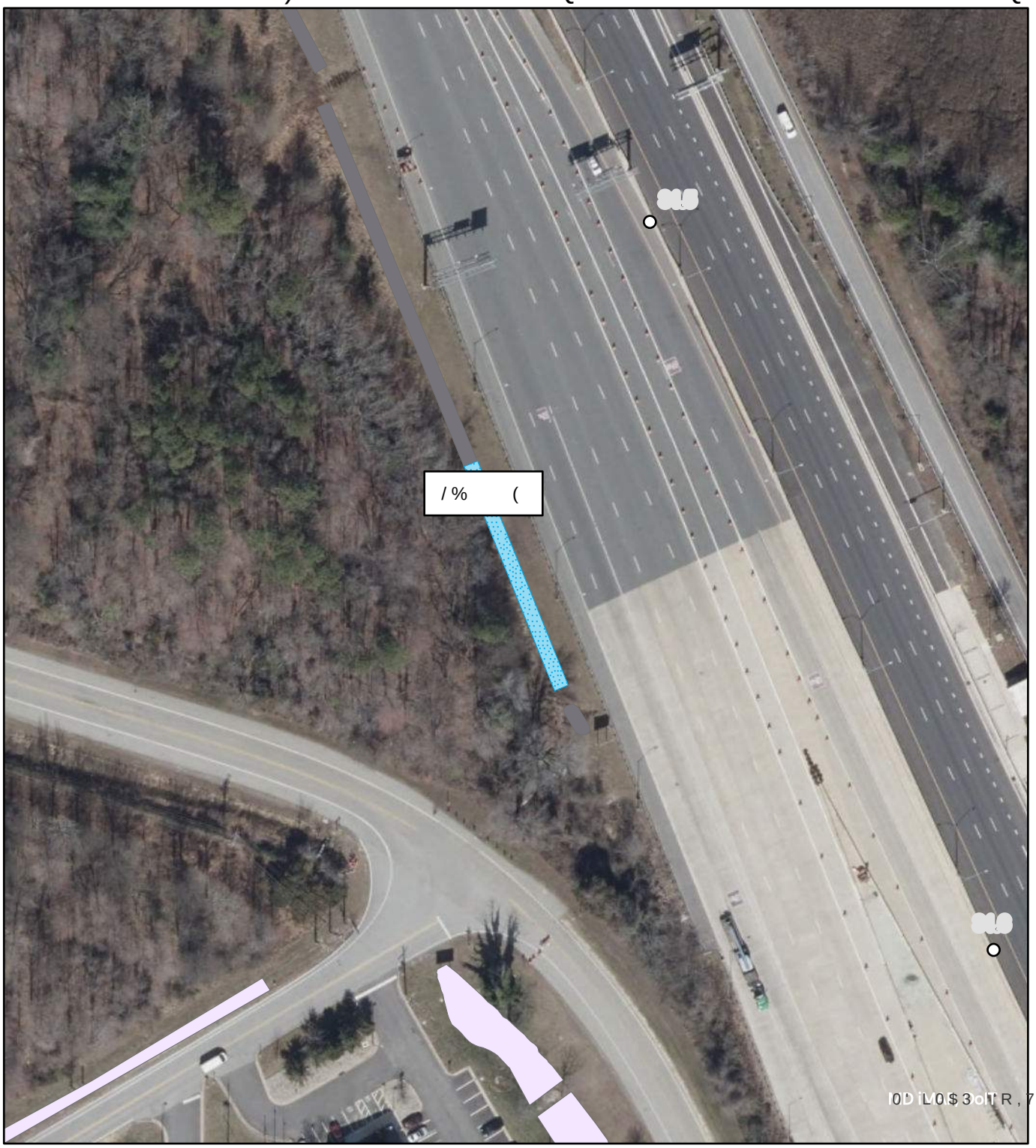
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k

6LWH 0DS /% (

%03 7\SH *UDVV &KDQQHO)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ
1 6:0 5LVHU
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" (QG DQG +HDGZDOOV
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)LOWHULQJ
+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRQ
2SHQ &KDQQHO 6\VWHP
%RG
:HWODQG

Maryland Transportation Authority

0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'(6 'DWD
%DVH 0DS (VUL ,PDJHU\

)HHW

Site Photos:

Photo Description:	Outfall
Photo Direction:	Looking downstream



Photo Description:	Treatment Area
Photo Direction:	Looking upstream



Photo Description:	Access
Photo Direction:	Looking upstream



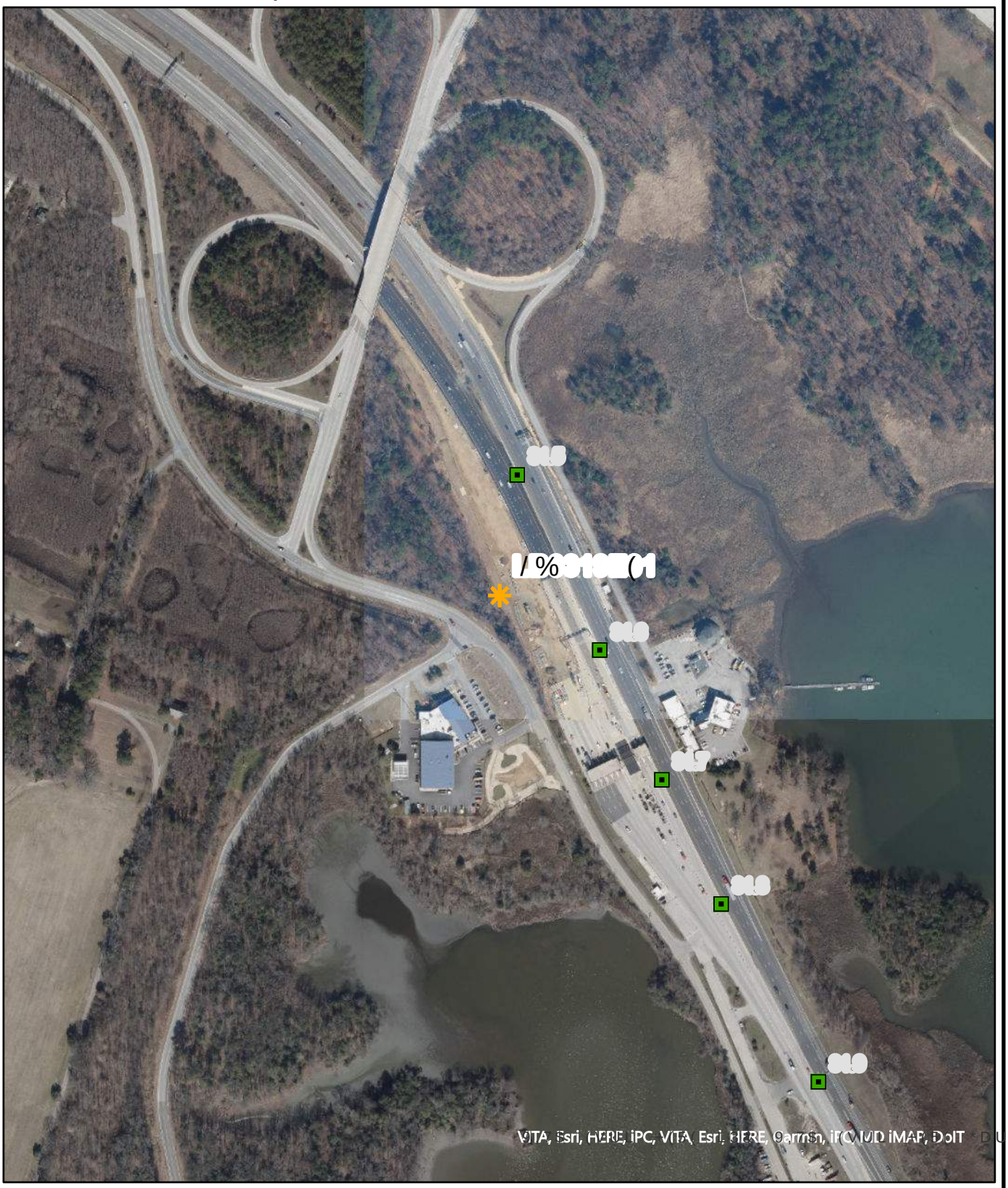
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Photo Direction:	Looking upstream



9LFLQLW\ 0DS /% (

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)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

'DWD 6RXUFHV 0'7$ 13'(6 *HRGDWDEDVH

%DVH 0DS (VUL ,PDJHU\

6LWH 0DS /% (

%03 7\SH *UDVV &KDQQHO)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWW@U3DUNLQJ %03 7<3(
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$,QOHW $FFHVV WR W %RQG
0DQKROH :HWODQG

)HHW

Maryland Transportation Authority

0DS 3UHSDUHG 'DWD 6RXUFHV 0'7$ 13'(6 'DWD %DVH 0DS (VUL ,PDJHU\

Site Photos:

Photo Description:	Access
Photo Direction:	Looking upstream



Photo Description:	Inflow
Photo Direction:	Looking upstream



Photo Description:	Outfall
Photo Direction:	Looking downstream



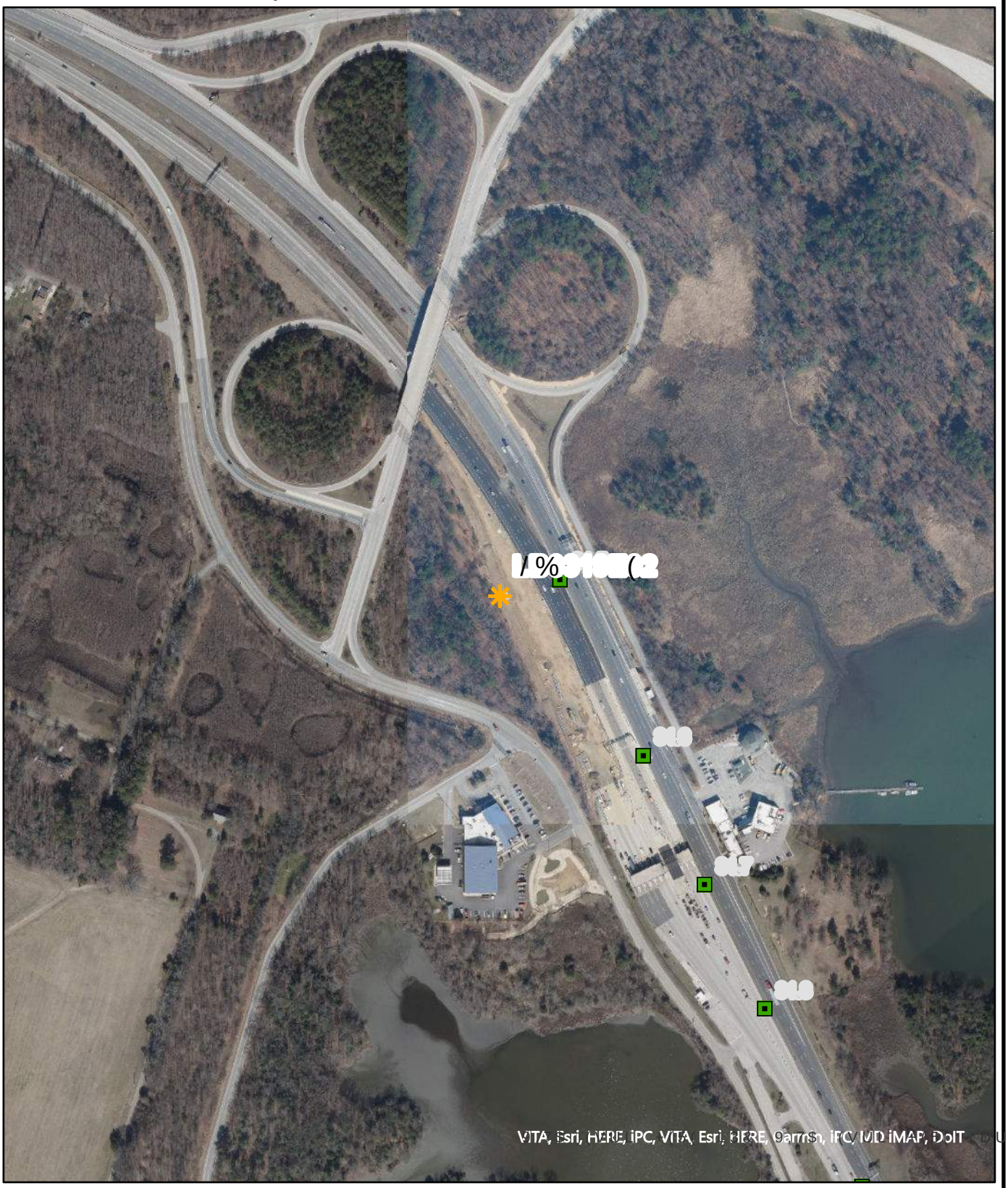
Photo Description:	Treatment Area
Photo Direction:	Looking downstream



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)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

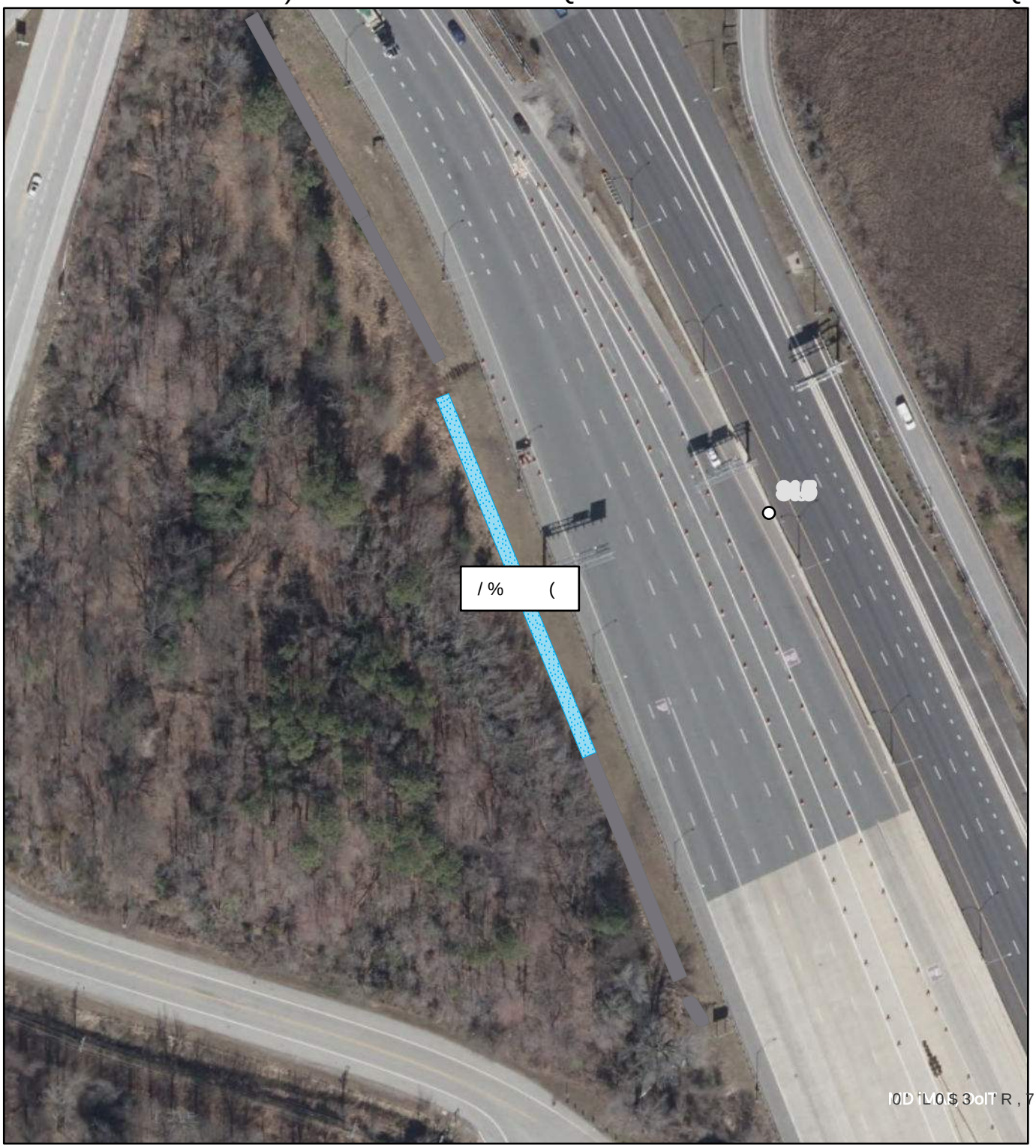
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6LWH 0DS /% (

%03 7\SH *UDVV &KDQQHO)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ %03 7<3(
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3LSH &RQQHFWLRQ +\GUDXOLF &RQQHFWLRQ 2SHQ &KDQQHO 6\VWHP
$,QOHW $FFHVV WR W %RQG
0DQKROH :HWODQG

)HHW

Maryland Transportation Authority

0DS 3UHSDUHG 'DWD 6RXUFHV 0'7$ 13'(6 'DWD %DVH 0DS (VUL ,PDJHU\

Site Photos:

Photo Description:	Access
Photo Direction:	Looking upstream



Photo Description:	Inflow
Photo Direction:	Looking downstream



Photo Description:	Treatment Area
Photo Direction:	Looking upstream



Photo Description:	Treatment Area
Photo Direction:	Looking upstream



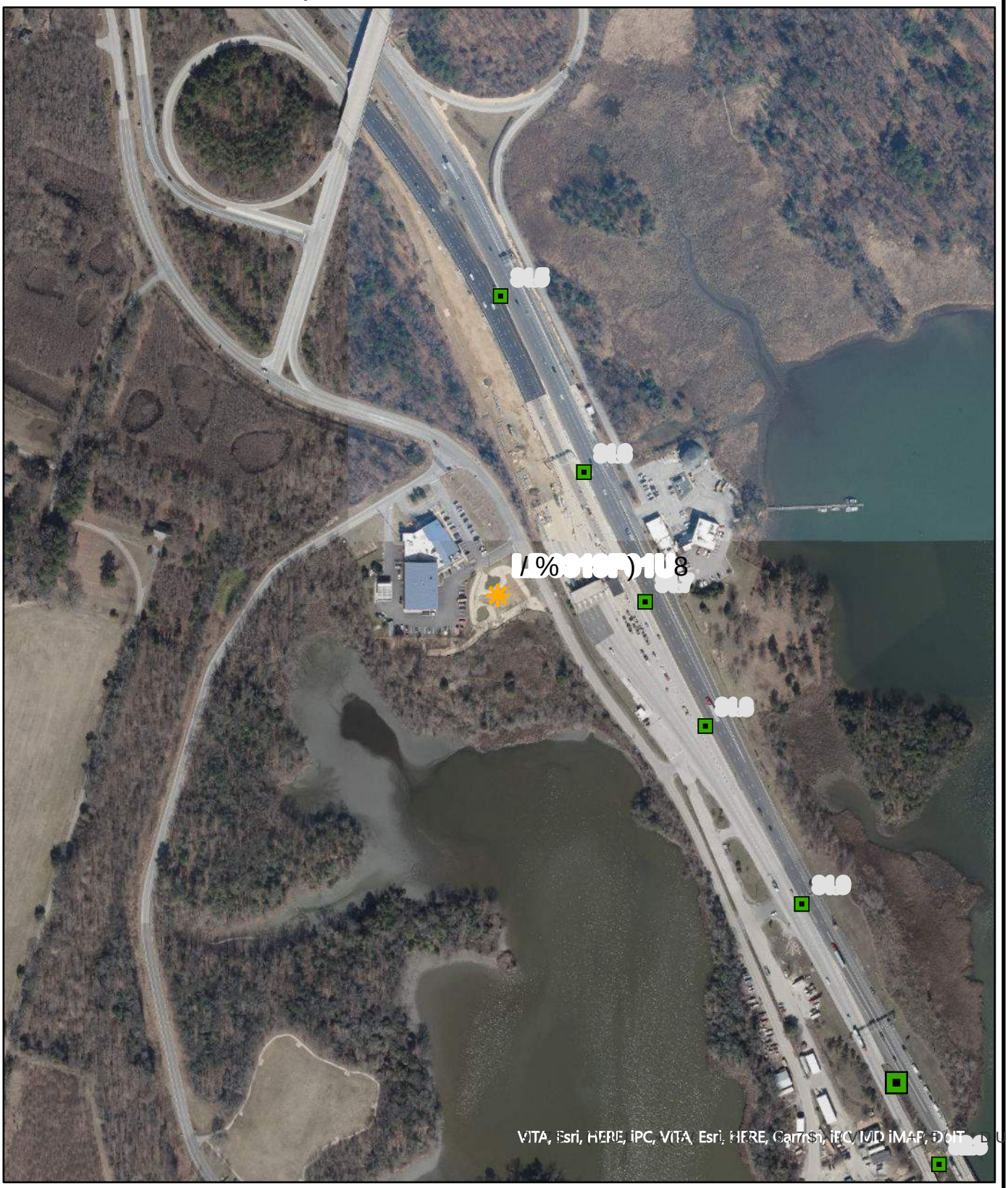
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Photo Direction:	Looking downstream



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)DFLOLW\ /DQH %ULGJH 0LOH 3RL



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

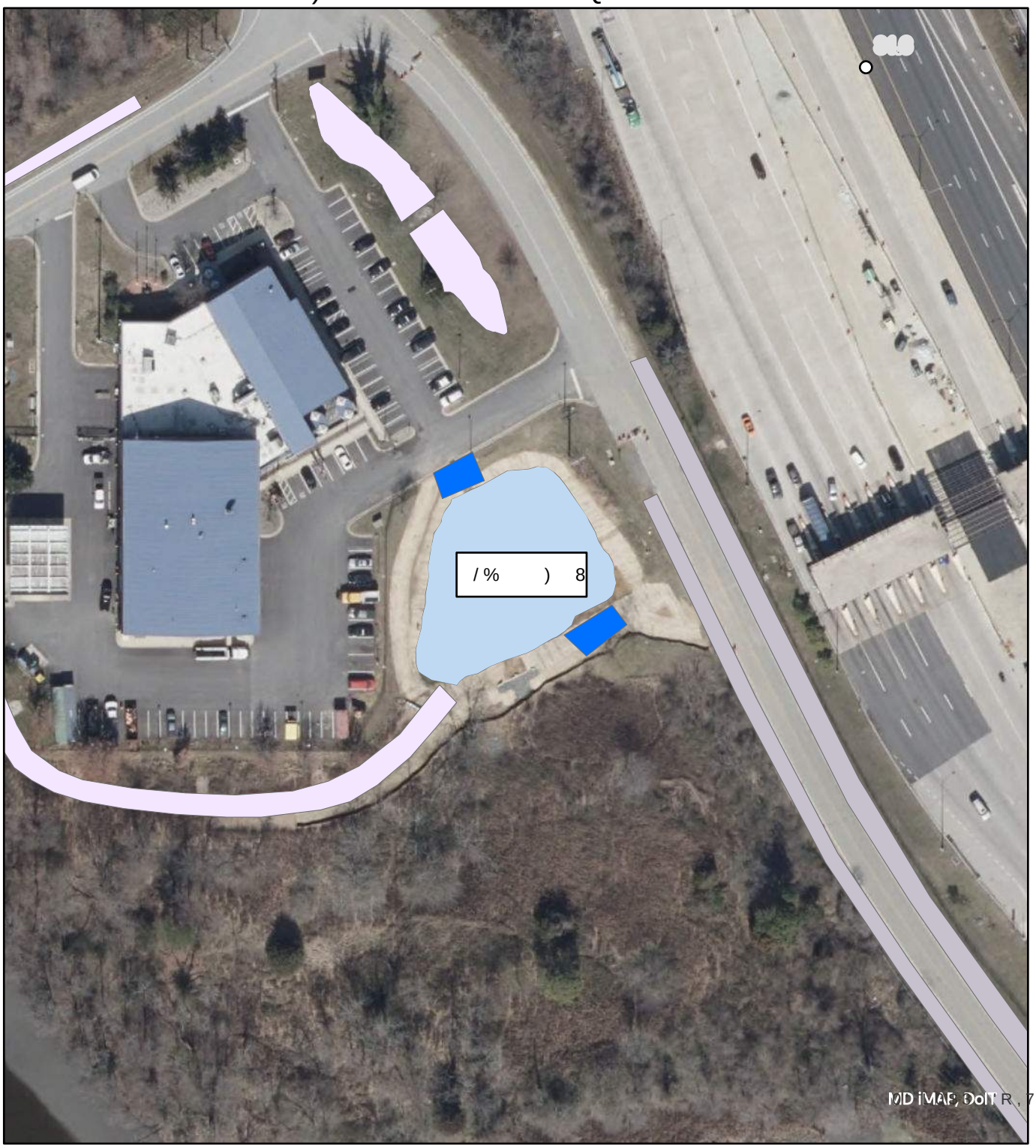
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6LWH 0DS /%) 8

%03 7\SH :HW 3RQG

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ %03 7<3(
1 6:0 5LVHU %03 *DWH)LOWHULQJ
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" (QG DQG +HDGZDOOV ,QILOWUDWLRQ
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$,QOHW $FFHVV WR W %RQG
0DQKROH :HWODQG

Maryland Transportation Authority

0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'(6 'DWD
%DVH 0DS (VUL ,PDJHU\

)HHW



LB0319F01OVD180619-01



LB0319F01OVU180619-02



LB0319F01OVU180619-03



LB0319F01IND180619-04



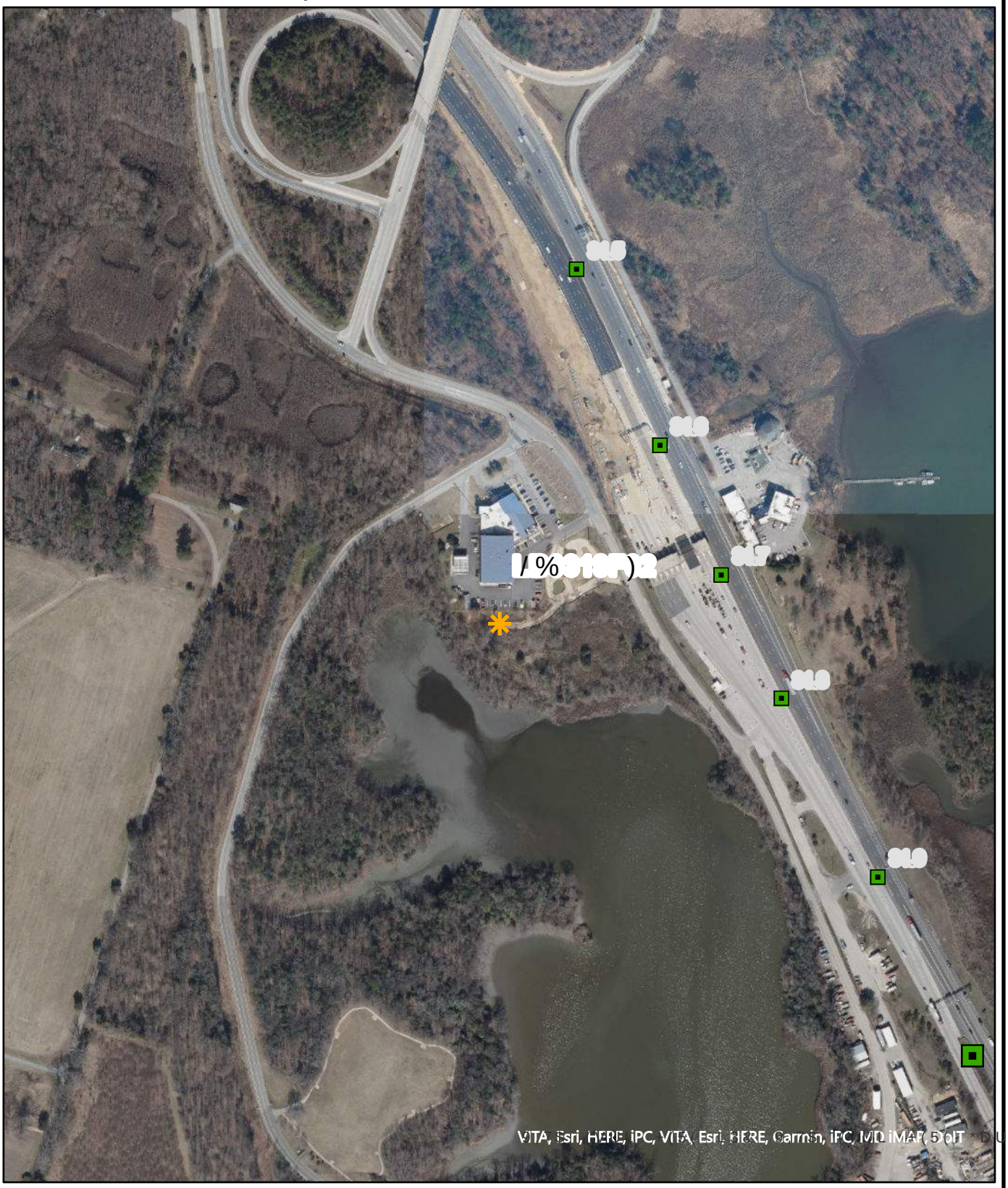
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LB0319F01OVM180619-06

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)DFLOLW\ /DQH %ULGJH 0LOH 3RL



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

'DWD 6RXUFHV 0'7$ 13'(6 *HRGDWDEDVH

%DVH 0DS (VUL ,PDJHU\

k

6LWH 0DS /%)

%03 7\SH /LQHDU 6DQG)LOWHU)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ %03 7<3(
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$,QOHW $FFHVV WR W %RQG
0DQKROH :HWODQG

)HHW

Maryland Transportation Authority

0DS 3UHSDUHG 'DWD 6RXUFHV 0'7$ 13'(6 'DWD %DVH 0DS (VUL ,PDJHU\

Site Photos:

Photo Description:	Outfall
Photo Direction:	Looking upstream



Photo Description:	Outfall
Photo Direction:	Looking downstream



Photo Description:	Treatment Area
Photo Direction:	Looking downstream



Photo Description:	Check Dam/ Berm
Photo Direction:	Top view



Photo Description:	Access
Photo Direction:	Looking upstream



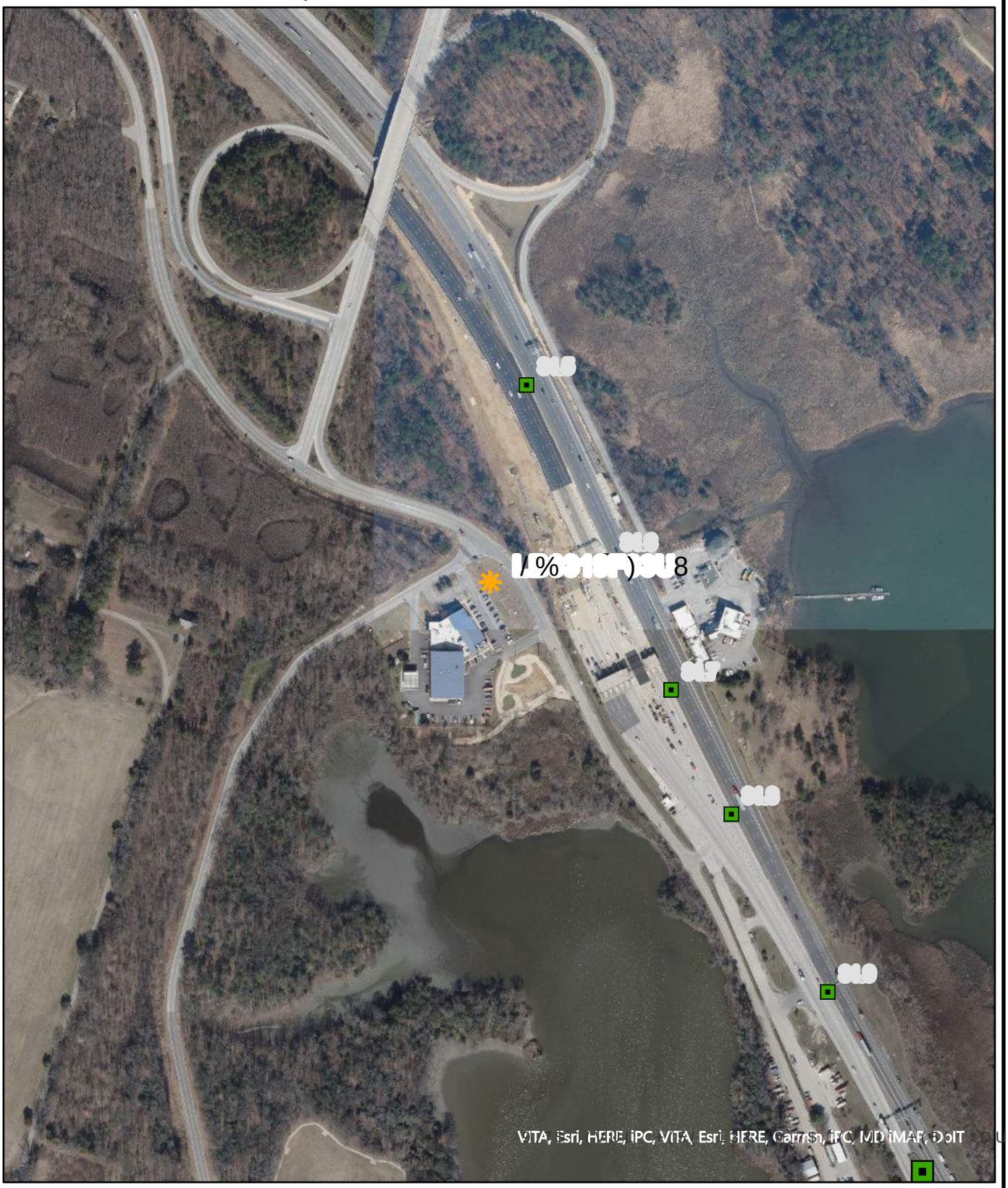
Photo Description:	Inflow
Photo Direction:	Looking upstream



9LFLQLW\ 0DS /%) 8

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)DFLOLW\ /DQH %ULGJH 0LOH 3RL



Maryland Transportation Authority

)HHW

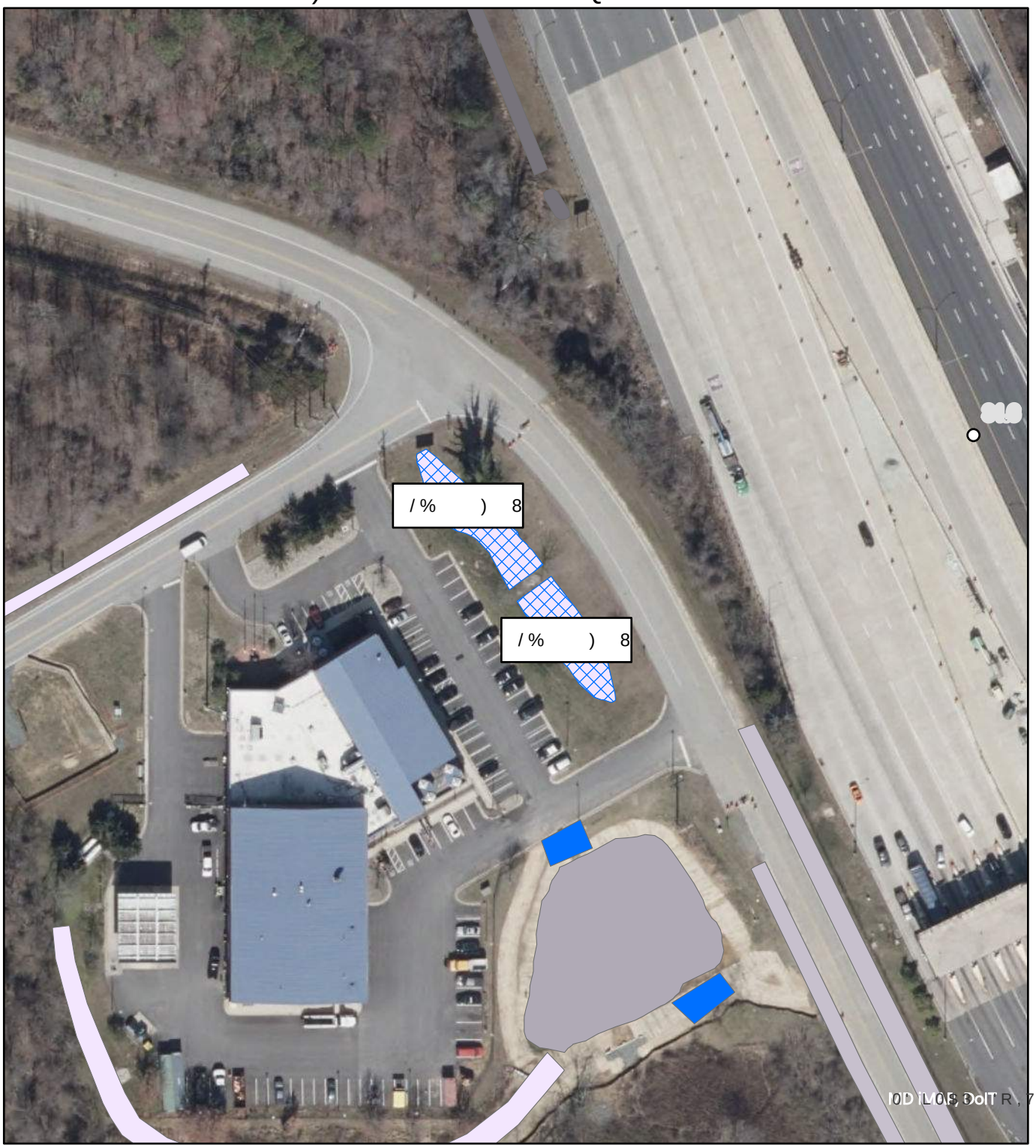
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6LWH 0DS /%) 8

%03 7\SH 6XEPHUJHG *UDYHO :HWODQG)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ
1 6:0 5LVHU
$:HLU
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$,QOHW 0DQKROH
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@ %03 *DWH
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:HWODQG
%03 7<3(
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%RG
:HWODQG
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Maryland Transportation Authority

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)HHW



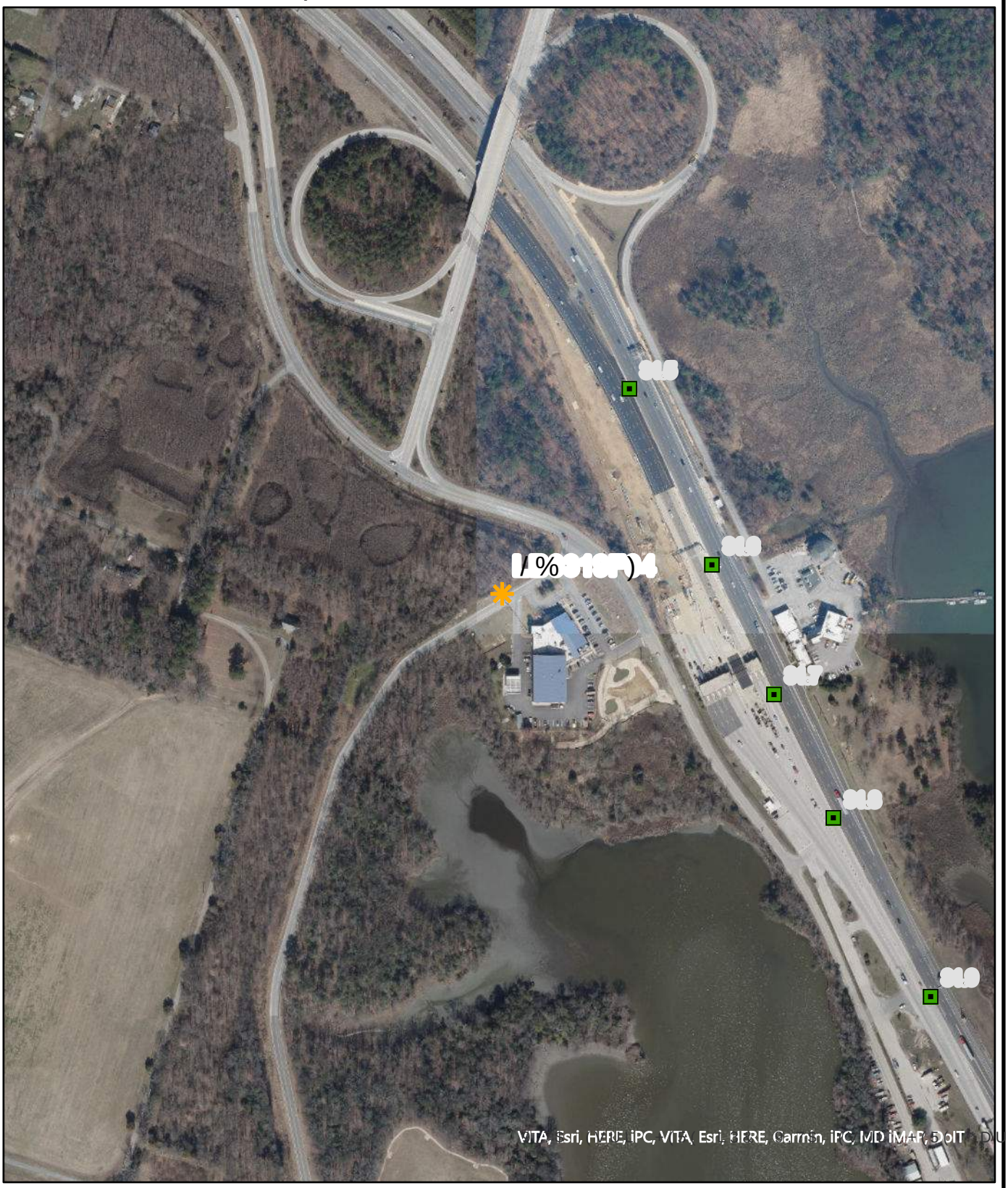
LB0319F03OVU180619-01



LB0319F03OVU180619-02

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)DFLOLW\ /DQH %ULGJH 0LOH 3RL



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

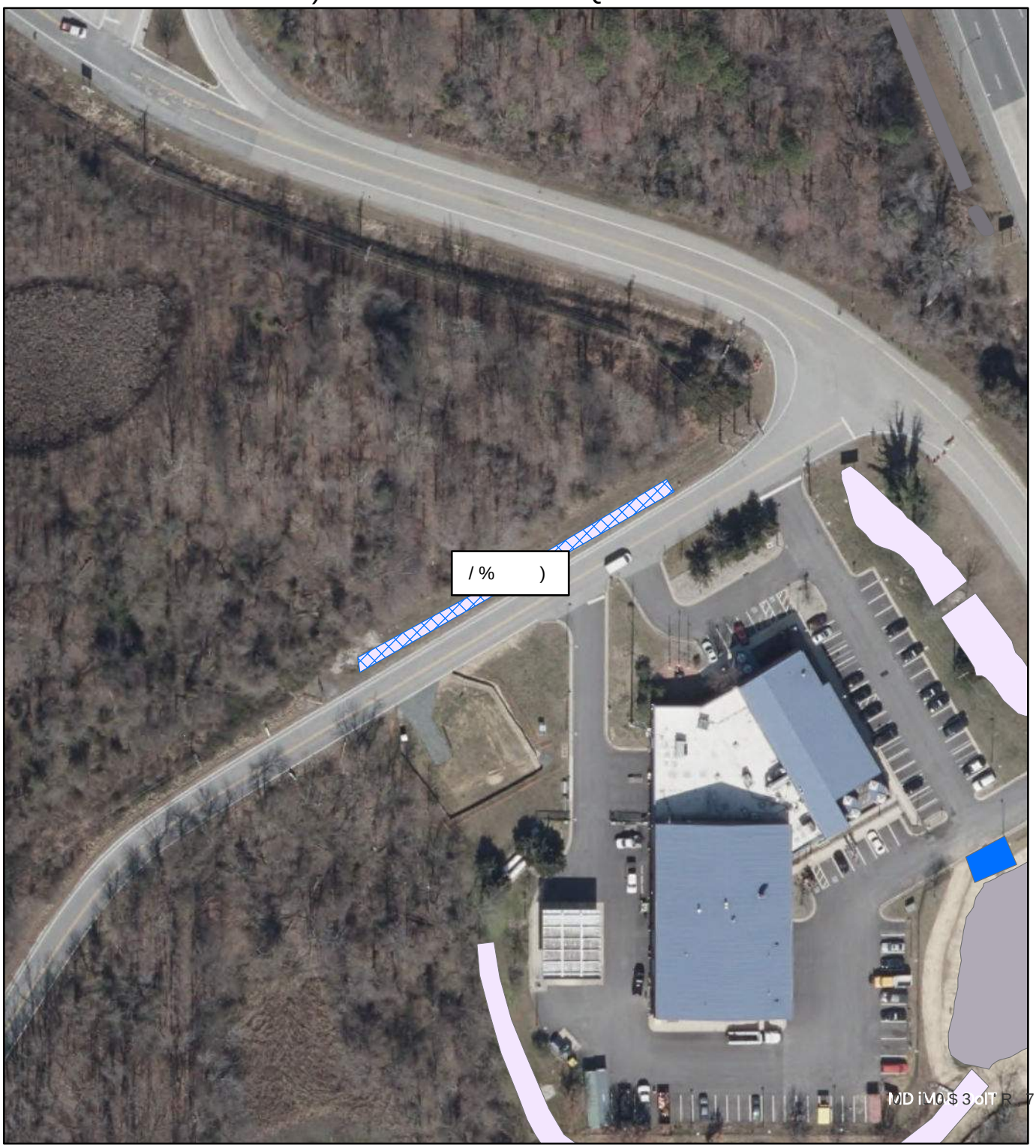
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%DVH 0DS (VUL ,PDJHU\

k

6LWH 0DS /%)

%03 7\SH /LQHDU 6DQG)LOWHU)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ
1 6:0 5LVHU
$:HLU
" (QG DQG +HDGZDOOV
3LSH &RQQHFWLRQ
$,QOHW
0DQKROH

%03 7<3(
)LOWHULQJ
+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRQ
2SHQ &KDQQHO 6\VWHP
%RG

)HHW

Maryland Transportation Authority

0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'(6 'DWD
%DVH 0DS (VUL ,PDJHU\

Site Photos:

Photo Description:	Access
Photo Direction:	Looking upstream



Photo Description:	Inflow
Photo Direction:	Looking downstream



Photo Description:	Treatment Area
Photo Direction:	



Photo Description:	Check Dam/ Berm
Photo Direction:	Top view



Photo Description:	Treatment Area
Photo Direction:	Looking upstream



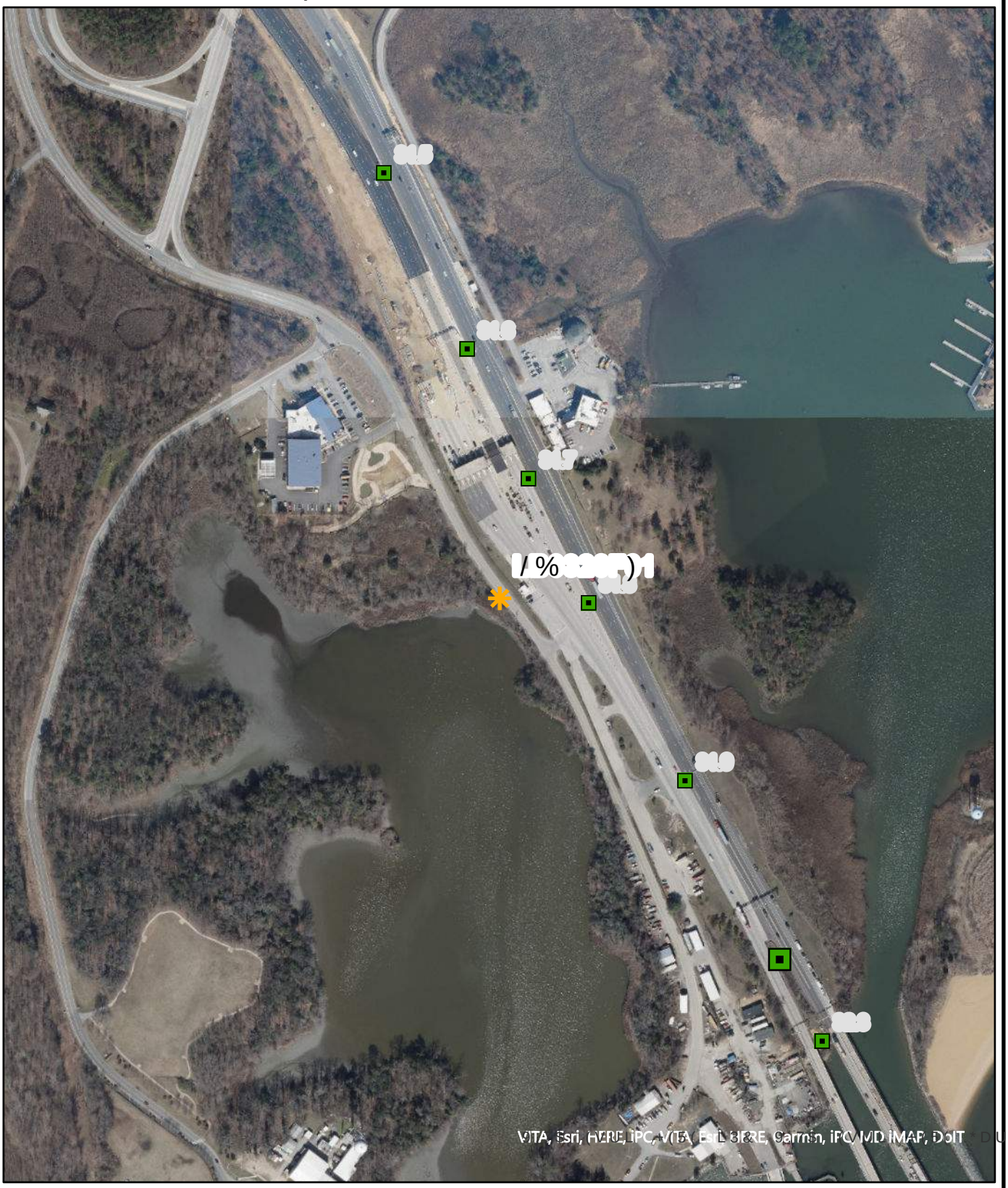
Photo Description:	Outfall
Photo Direction:	Looking downstream



9LFLQLW\ 0DS /%)

%03 7\SH 3HUPHDEOH 3DYLQJ

)DFLOLW\ /DQH %ULGJH 0LOH 3RL



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

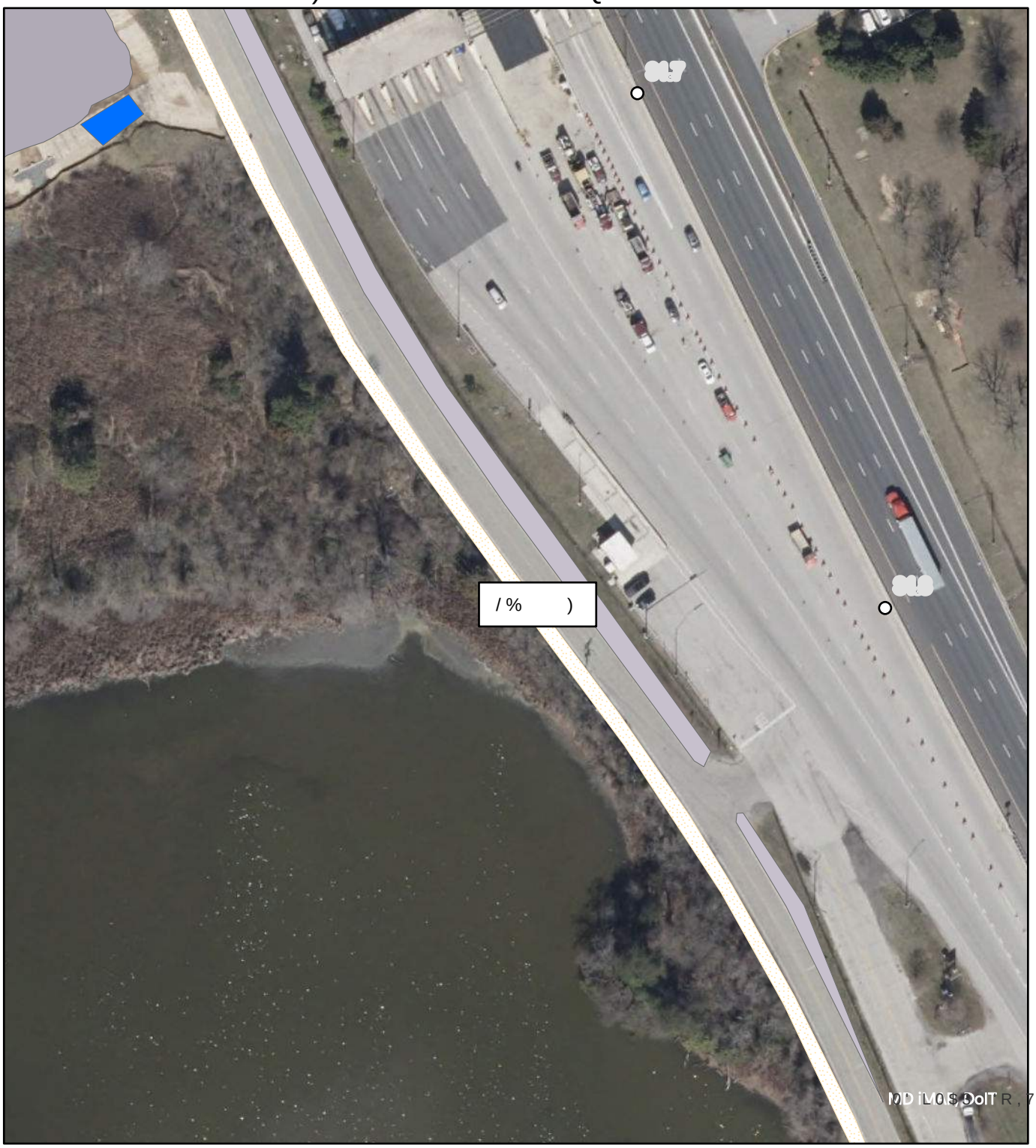
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%DVH 0DS (VUL ,PDJHU\

k

6LWH 0DS /%)

%03 7\SH 3HUPHDEOH 3DYLQJ)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ
1 6:0 5LVHU
$:HLU
" (QG DQG +HDGZDOOV
3LSH &RQQHFWLRQ
$,QOHW
0DQKROH

%03 7<3(
)LOWHULQJ
+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRQ
2SHQ &KDQQHO 6\VWHP
%RG
:HWODQG

Maryland Transportation Authority

0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'(6 'DWD
%DVH 0DS (VUL ,PDJHU\

)HHW

Site Photos:

Photo Description:	Inflow
Photo Direction:	Looking upstream



Photo Description:	Access
Photo Direction:	Looking upstream



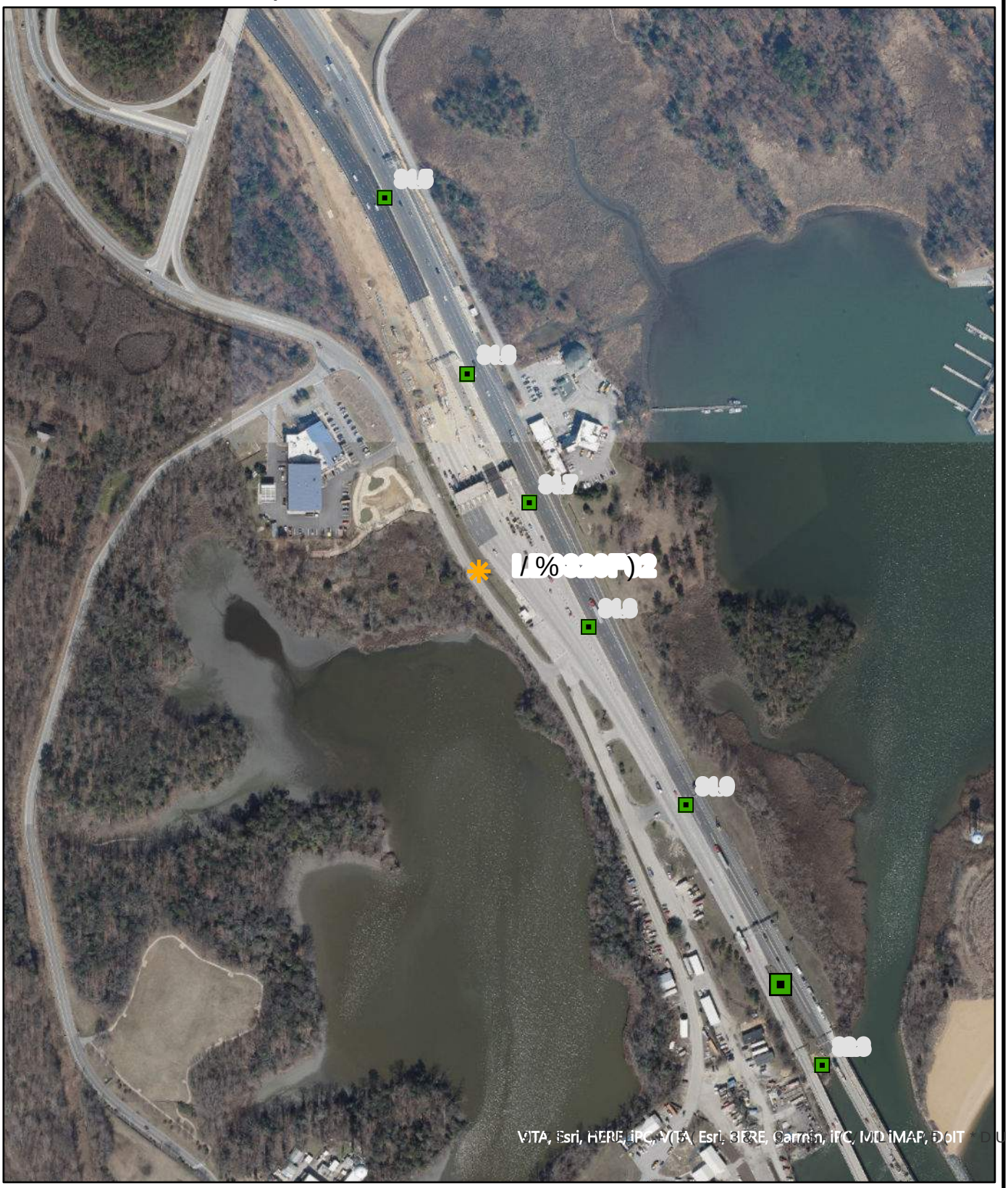
Photo Description:	Treatment Area
Photo Direction:	Looking upstream



9LFLQLW\ 0DS /%)

%03 7\SH 3HUPHDEOH 3DYLQJ

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

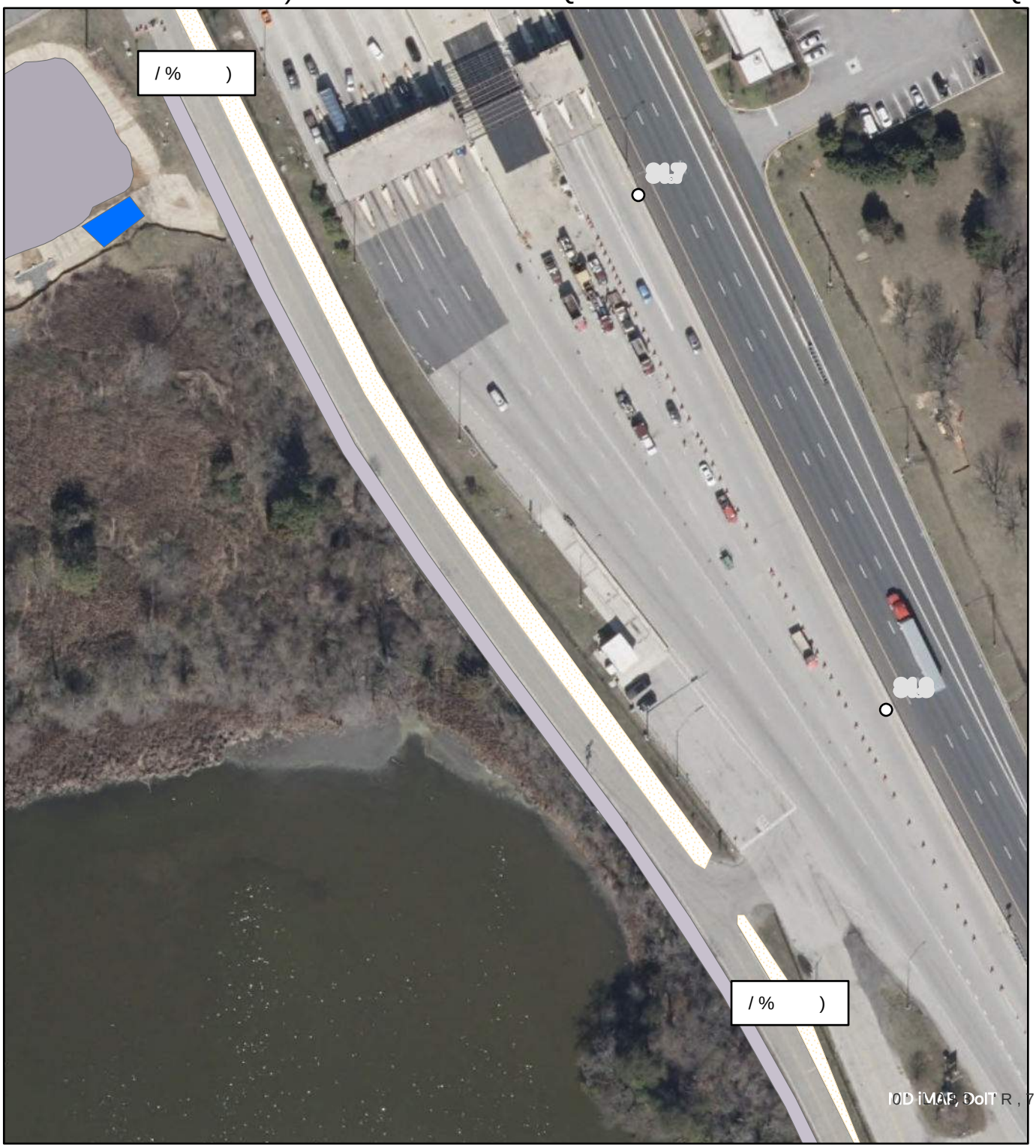
'DWD 6RXUFHV 0'7$ 13'(6 *HRGDWDEDVH

%DVH 0DS (VUL ,PDJHU\

k

6LWH 0DS /%)

%03 7\SH 3HUPHDEOH 3DYLQJ)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ %03 7<3(
1 6:0 5LVHU @ %03 *DWH)LOWHULQJ
$:HLU 6WRUP 'UDLQ +\GURG\QDPLF 6WUXFWXUHV
" (QG DQG +HDGZDOOV ,QILOWUDWLRQ
3LSH &RQQHFWLRQ +\GUDXOLF &RQQHFWLRQ 2SHQ &KDQQHO 6\VWHP
$,QOHW $FFHVV WR W %RQG
0DQKROH :HWODQG

Maryland Transportation Authority

0DS 3UHSDUHG 'DWD 6RXUFHV 0'7$ 13'(6 'DWD %DVH 0DS (VUL ,PDJHU\

)HHW

Site Photos:

Photo Description:	Access
Photo Direction:	Looking downstream



Photo Description:	Treatment Area
Photo Direction:	Looking upstream

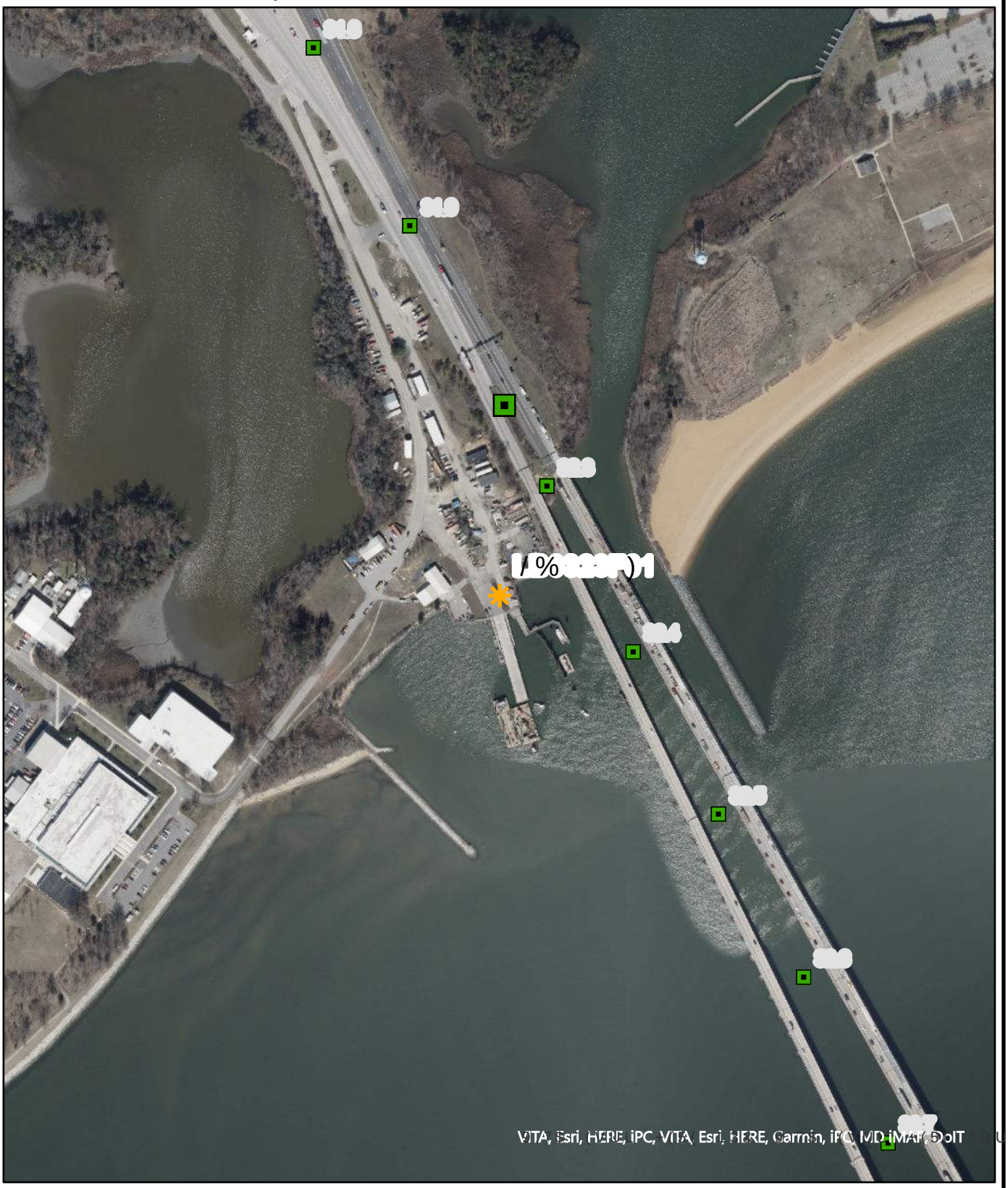


Photo Description:	Treatment Area
Photo Direction:	Looking upstream



9LFLQLW\ 0DS /%)

%03 7\SH 0LFUR %LRUHWHQWLRQ)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

'DWD 6RXUFHV 0'7$ 13'(6 *HRGDWDEDVH

%DVH 0DS (VUL ,PDJHU\

6LWH 0DS /%)

%03 7\SH 0LFUR %LRUHWHQWLRQ

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ

1 6:0 5LVHU

$:HLU

" (QG DQG +HDGZDOOV

3LSH &RQQHFWLRQ

$,QOHW

0DQKROH

@ 3DUNLQJ

@ %03 *DWH

6WRUP 'UDLQ

,QOHW

+\GURDXOLF &RQQHFWLRQ

$FFHVV WR W

%03 7<3(

)LOWHULQJ

+\GURG\QDPLF 6WUXFWXUHV

,QILOWUDWLRQ

2SHQ &KDQQHO 6\VWHP

%RG

:HWODQG

Maryland Transportation Authority

0DS 3UHSDUHG 'DWD 6RXUFHV 0'7$ 13'(6 'DWD %DVH 0DS (VUL ,PDJHU\

)HHW

Site Photos:

Photo Description:	Control Structure
Photo Direction:	Top view



Photo Description:	Treatment Area
Photo Direction:	Looking upstream



Photo Description:	Inflow
Photo Direction:	Looking downstream



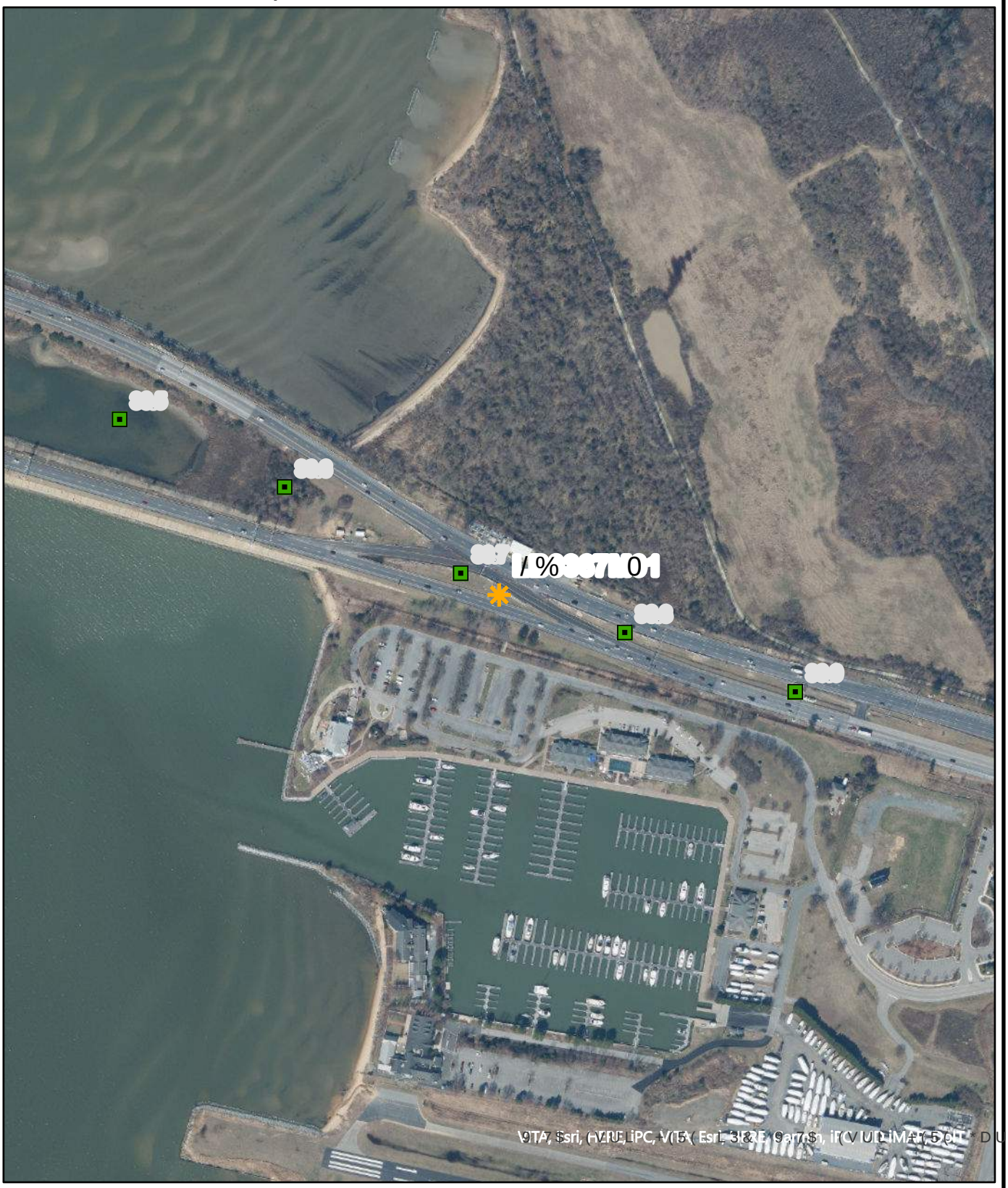
Photo Description:	Access
Photo Direction:	Looking upstream



9LFLQLW\ 0DS /% 0

%03 7\SH *UDVV 6ZDOH

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

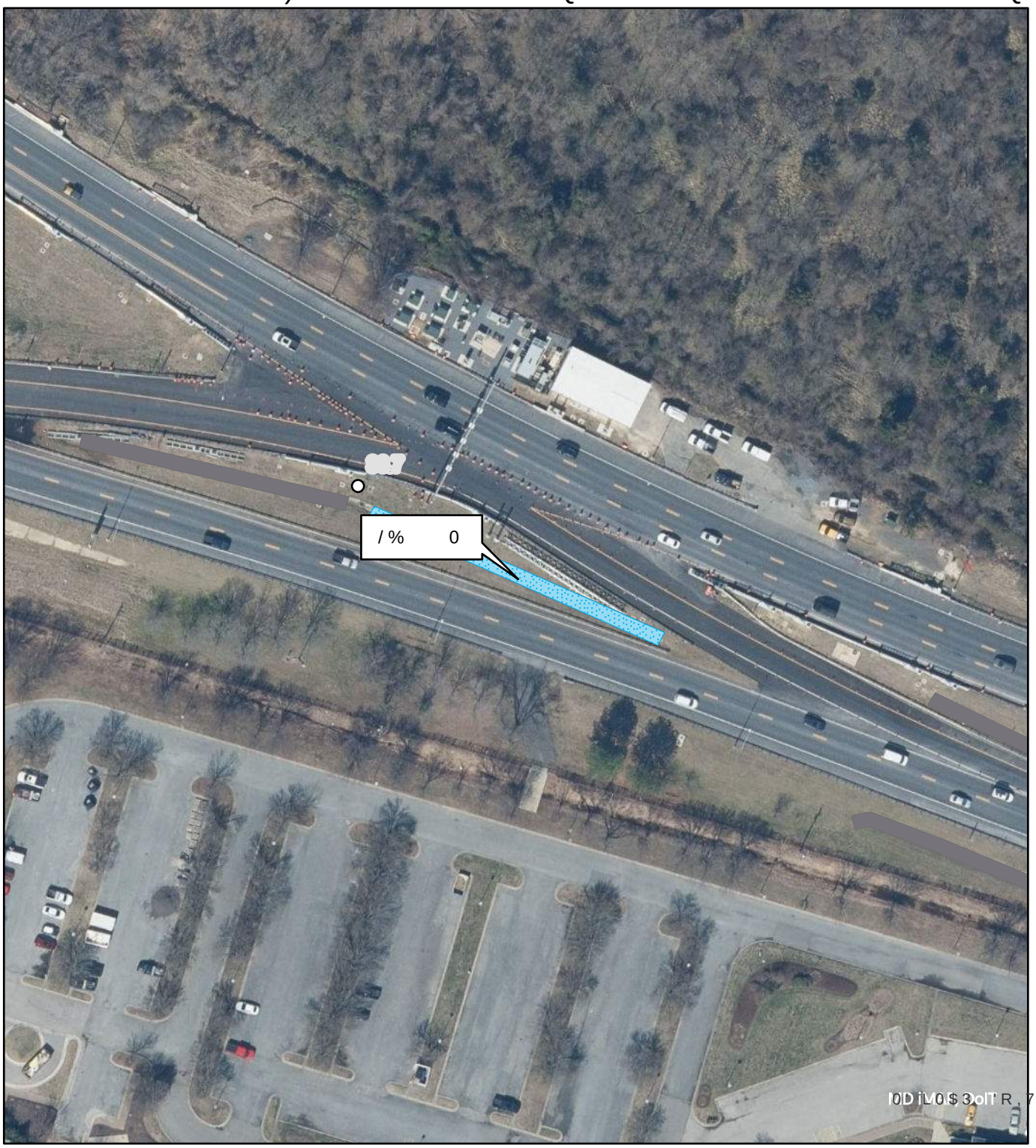
'DWD 6RXUFHV 0'7$ 13'(6 *HRGDWDEDVH

%DVH 0DS (VUL ,PDJHU\

k

6LWH 0DS /% 0

%03 7\SH *UDVV 6ZDOH)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWW@U3DUNLQJ
1 6:0 5LVHU @%03 *DWH
$:HLU 6WRUP 'UDLQ
" (QG DQG +HDGZDOOV
3LSH &RQQHFWLRQ
$,QOHW
0DQKROH

%03 7<3(
)LOWHULQJ
+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRQ
2SHQ &KDQQHO 6\VWHP
%RG
:HWODQG

Maryland Transportation Authority

0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'6 'DWD
%DVH 0DS (VUL ,PDJHU\

)HHW

Site Photos:

Photo Description:	Access
Photo Direction:	Looking upstream



Photo Description:	Control Structure
Photo Direction:	Looking downstream



Photo Description:	Control Structure
Photo Direction:	Top view



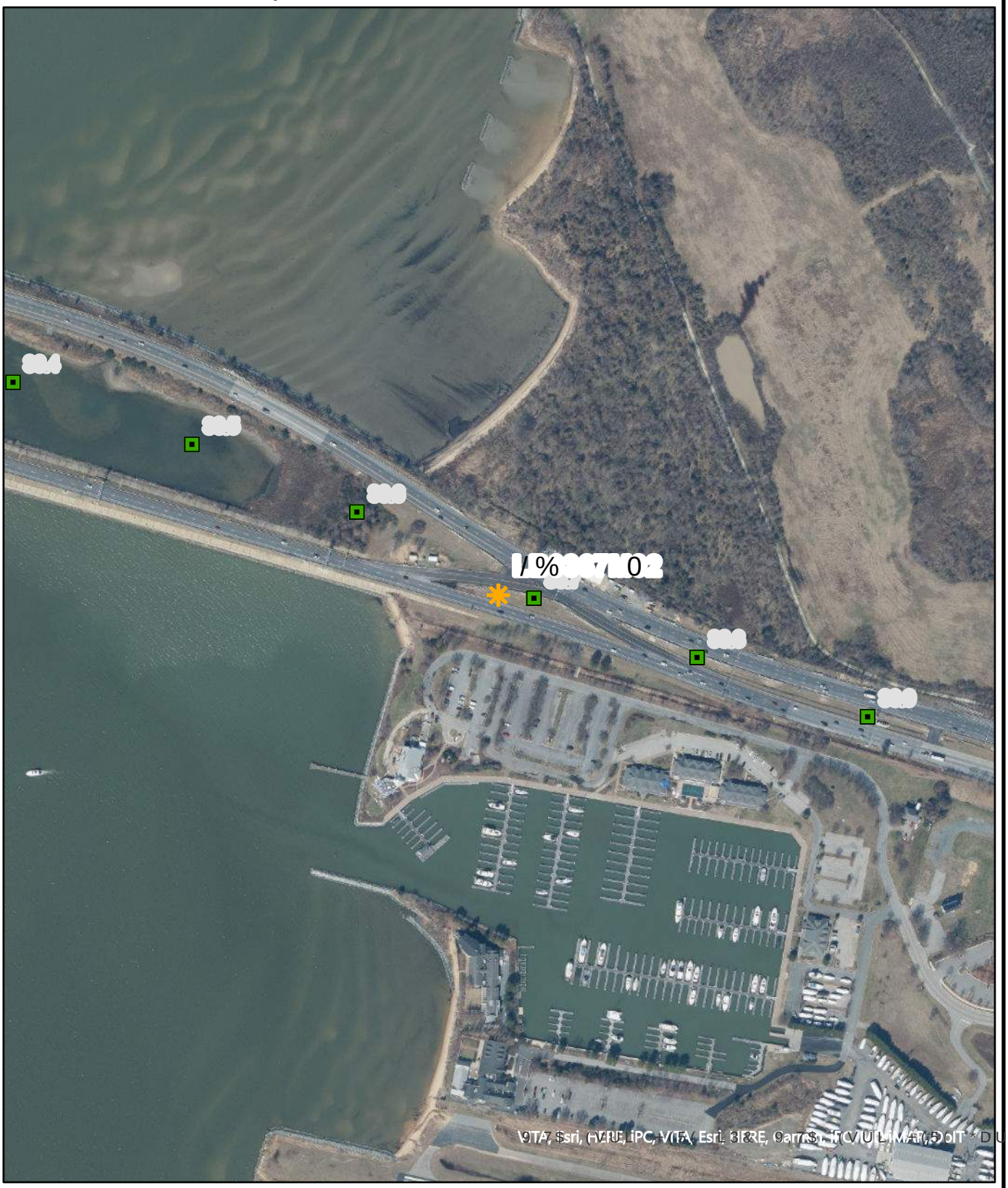
Photo Description:	Treatment Area
Photo Direction:	Looking upstream



9LFLQLW\ 0DS /% 0

%03 7\SH *UDVV 6ZDOH

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

'DWD 6RXUFHV 0'7$ 13'(6 *HRGDWDEDVH

%DVH 0DS (VUL ,PDJHU\

6LWH 0DS /% 0

%03 7\SH *UDVV 6ZDOH)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



)ORZ 6SOLWW@3DUNLQJ
6:0 5LVHU
:HLU
(QG DQG +HDGZDOOV
3LSH &RQQHFWLRQ
,QOHW
0DQKROH
%03 7<3(
%03 *DWH
6WRUP 'UDLQ
)LOWHULQJ
+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRQ
+\GUDXOLF &RQQHFWLRQ
2SHQ &KDQQHO 6\VWHP
$FFHVV WR W%RG
%RG
:HWODQG

Maryland Transportation Authority

0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'6 'DWD
%DVH 0DS (VUL ,PDJHU\

)HHW

Site Photos:

Photo Description:	Control Structure
Photo Direction:	Top view



Photo Description:	Access
Photo Direction:	Looking downstream



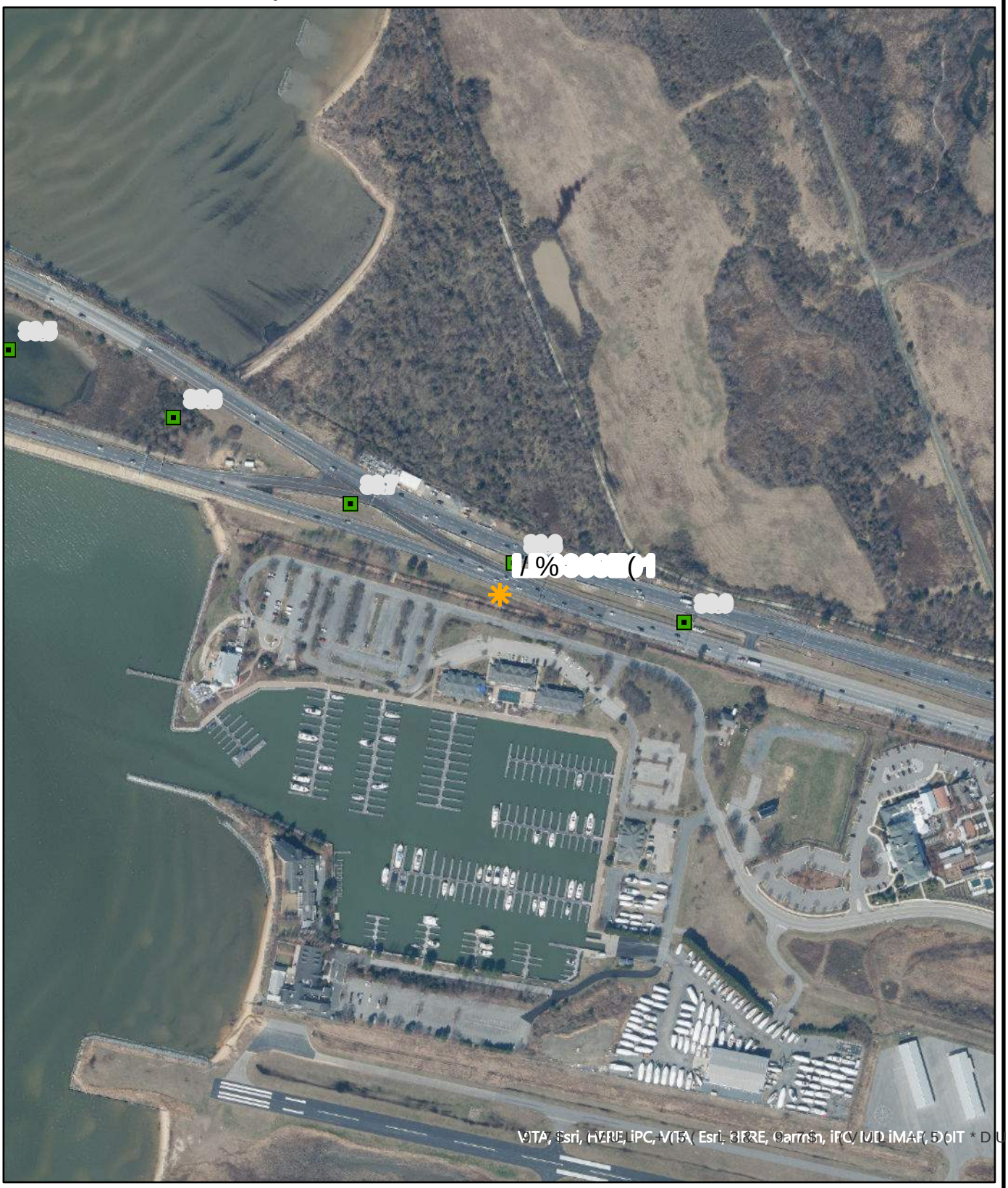
Photo Description:	Treatment Area
Photo Direction:	Looking upstream



9LFLQLW\ 0DS /% (

%03 7\SH *UDVV 6ZDOH

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

'DWD 6RXUFHV 0'7$ 13'(6 *HRGDWDEDVH

%DVH 0DS (VUL ,PDJHU\

k

6LWH 0DS /% (

%03 7\SH *UDVV 6ZDOH)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ
1 6:0 5LVHU
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%03 7<3(
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+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRQ
2SHQ &KDQQHO 6\VWHP
%RG
:HWODQG

Maryland Transportation Authority

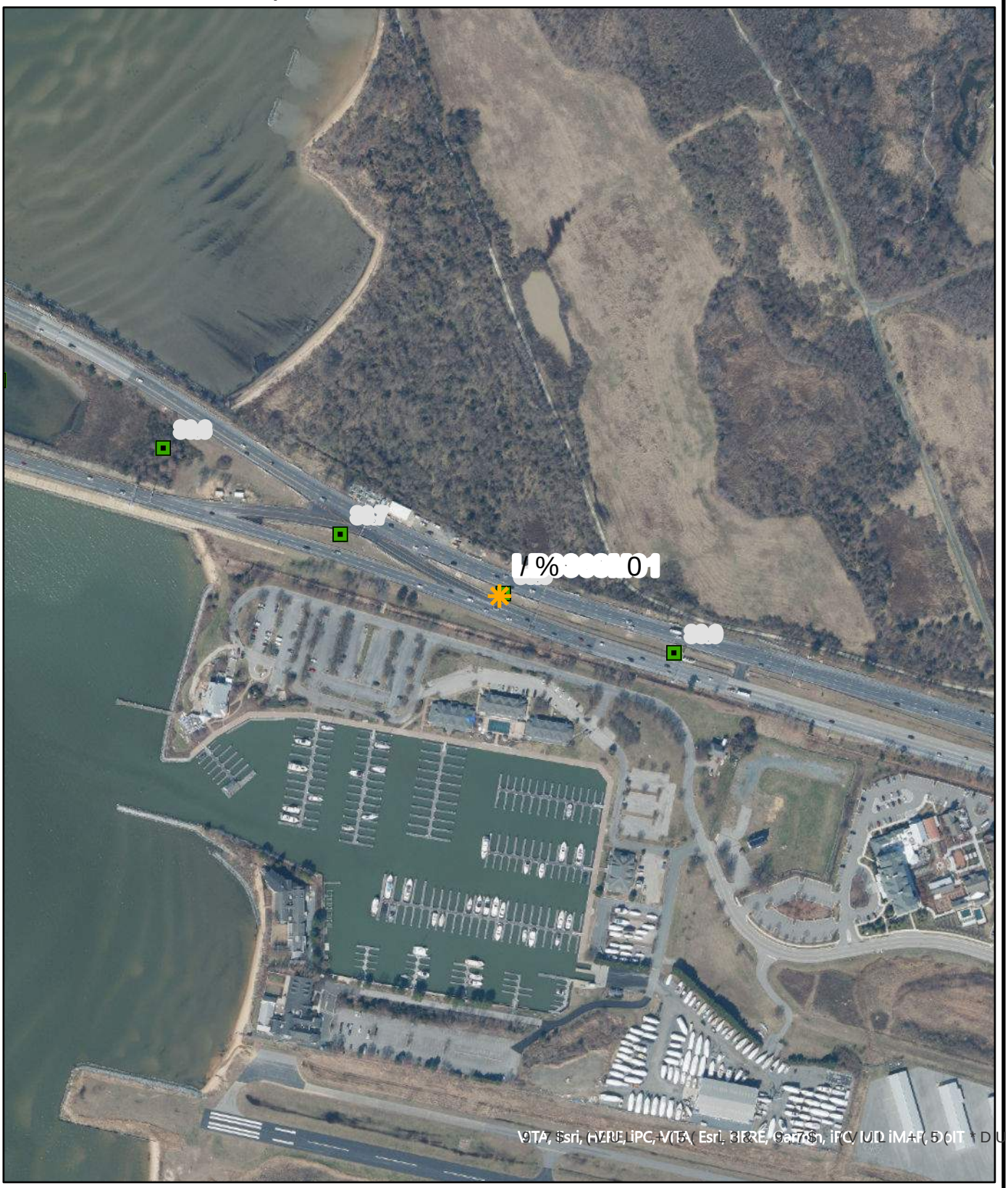
0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'(6 'DWD
%DVH 0DS (VUL ,PDJHU\

)HHW

9LFLQLW\ 0DS /% 0

%03 7\SH *UDVV 6ZDOH

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

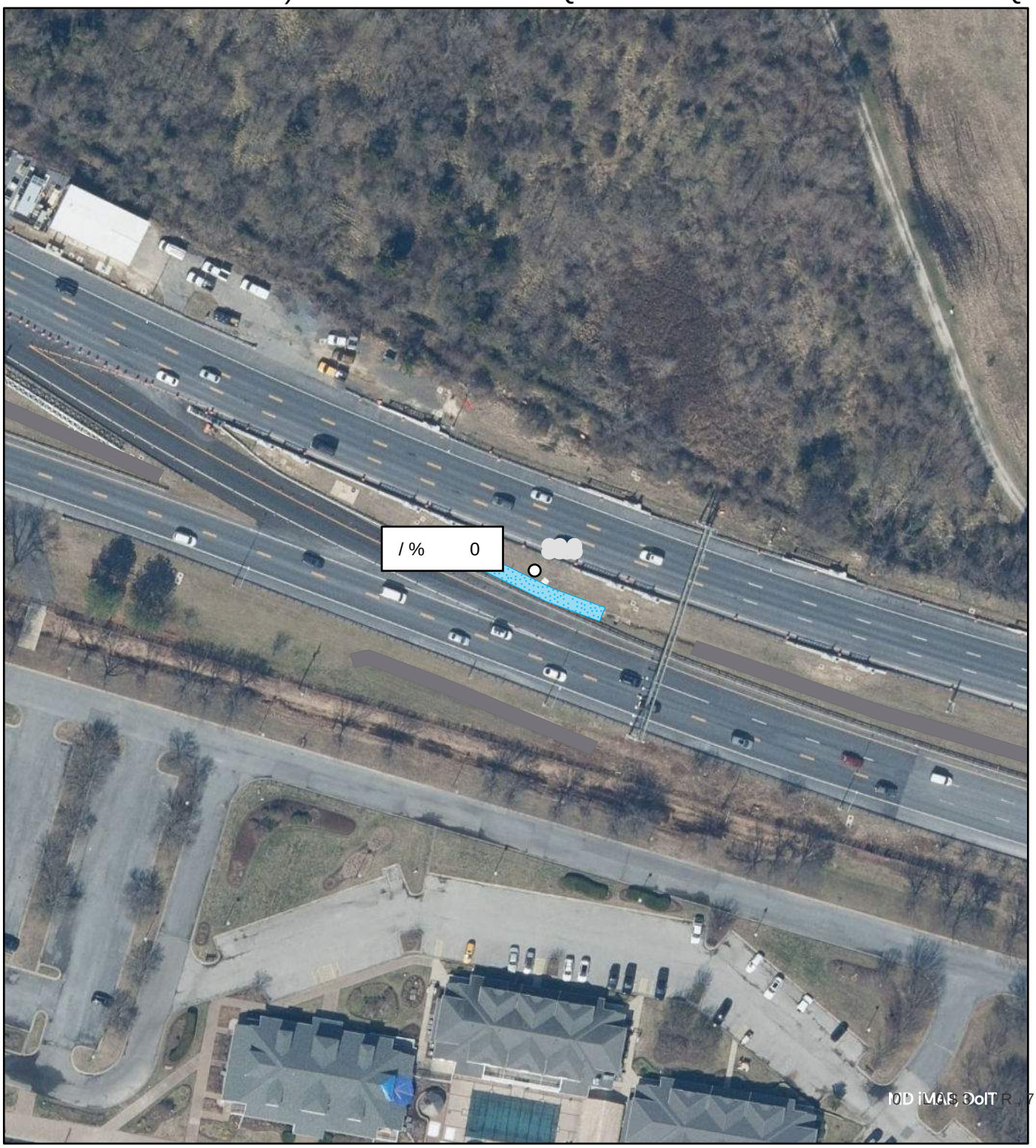
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'DWD 6RXUFHV 0'7$ 13'(6 *HRGDWDEDVH

%DVH 0DS (VUL ,PDJHU\

6LWH 0DS /% 0

%03 7\SH *UDVV 6ZDOH)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ
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" (QG DQG +DQGZDOOV
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%03 7<3(
)LOWHULQJ
+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRQ
2SHQ &KDQQHO 6\VWHP
%RG
:HWODQG

)HHW

Maryland Transportation Authority

0DS 3UHSDUHG 'DWD 6RXUFHV 0'7$ 13'(6 'DWD %DVH 0DS (VUL ,PDJHU\

Site Photos:

Photo Description:	Access
Photo Direction:	Looking downstream



Photo Description:	Treatment Area
Photo Direction:	Looking upstream



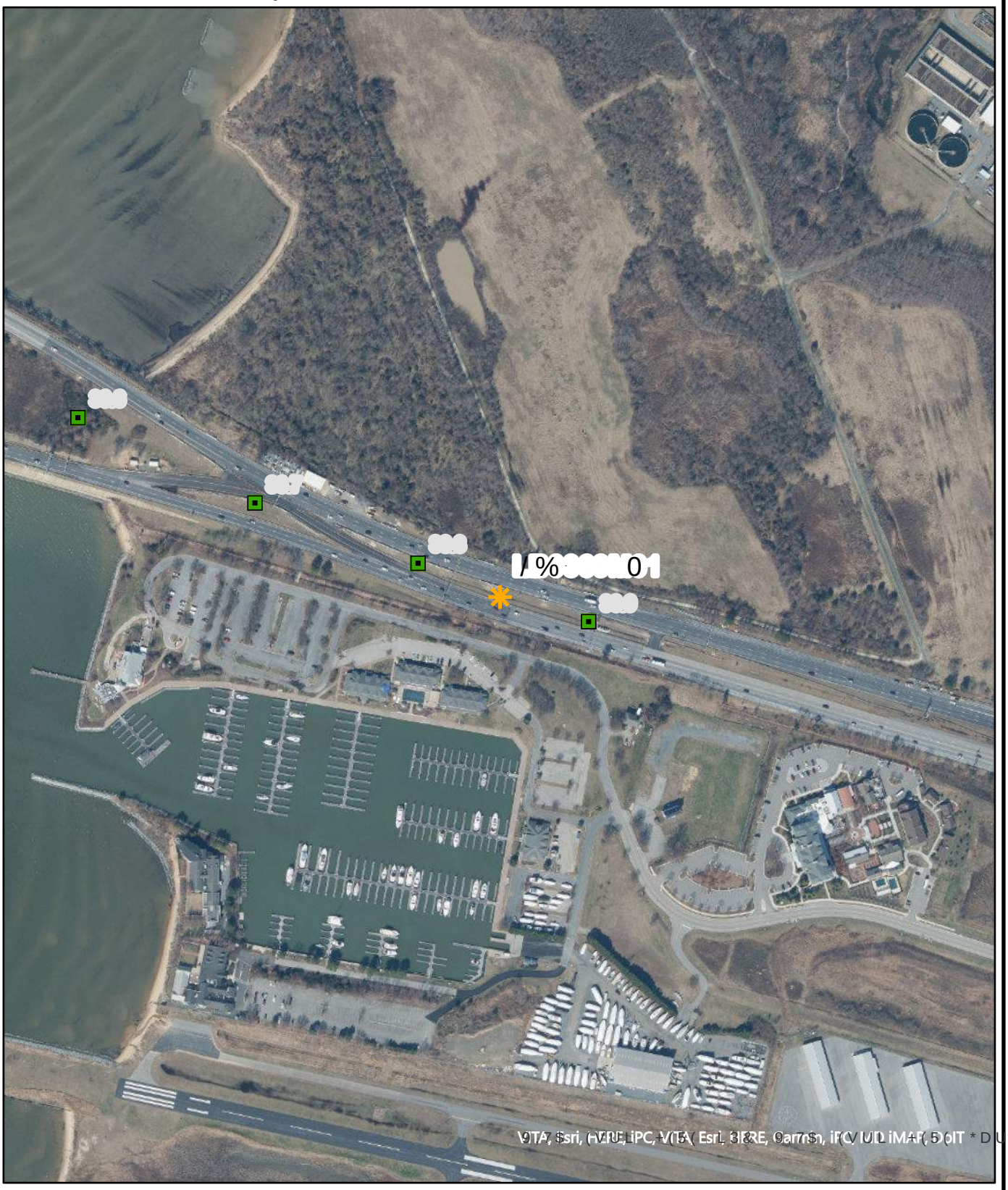
Photo Description:	Control Structure
Photo Direction:	Looking downstream



9LFLQLW\ 0DS /% 0

%03 7\SH *UDVV 6ZDOH

)DFLOLW\ /DQH %ULGJH 0LOH 3RLQ



Maryland Transportation Authority

)HHW

0DS 3UHSDUHG

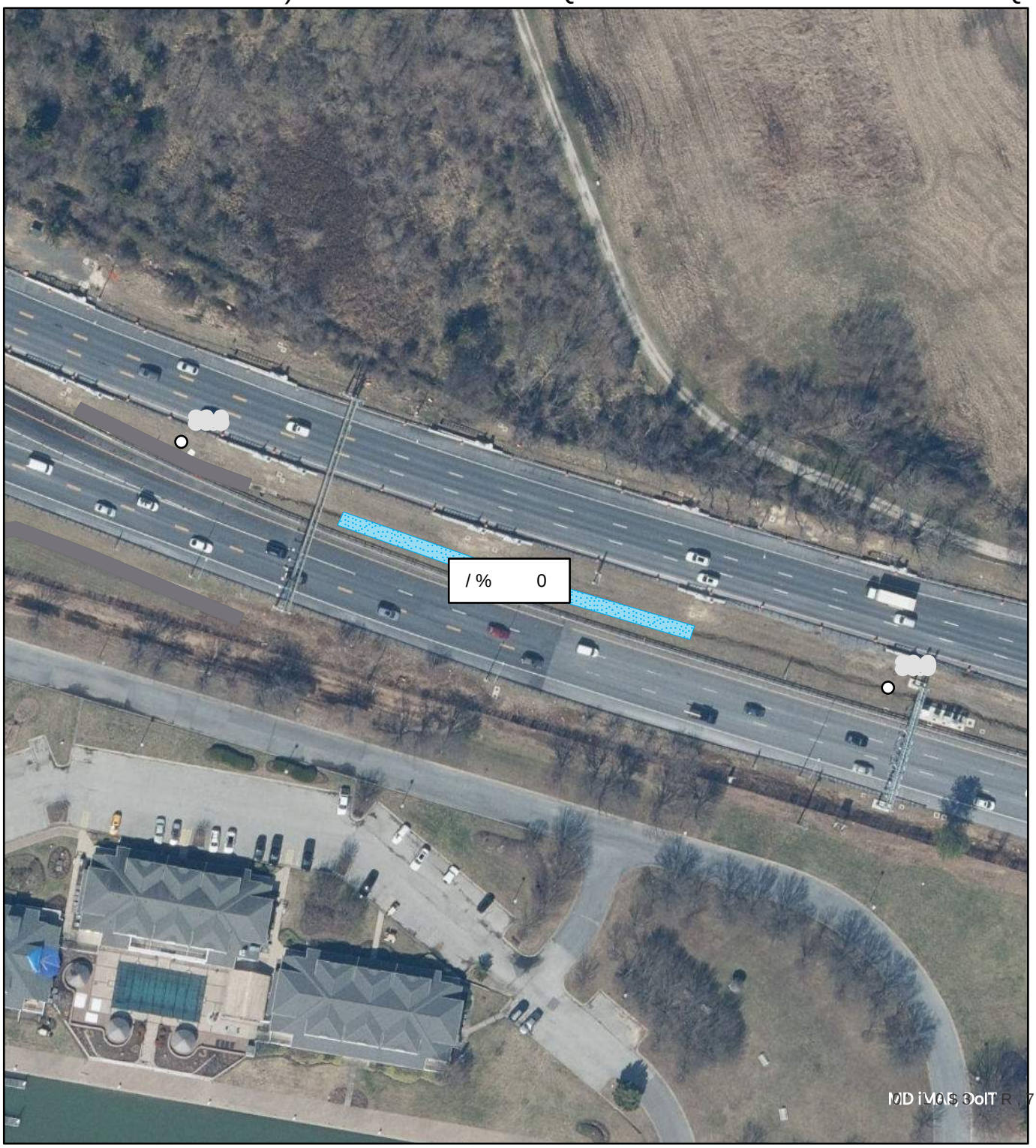
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%DVH 0DS (VUL ,PDJHU\

k

6LWH 0DS /% 0

%03 7\SH *UDVV 6ZDOH)DFLOLW\ /DQH %ULGJH 0LOH 3RLQW



$)ORZ 6SOLWWHU 3DUNLQJ
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" (QG DQG +HDGZDOOV
3LSH &RQQHFWLRQ
$,QOHW
0DQKROH
%03 7<3(
)LOWHULQJ
+\GURG\QDPLF 6WUXFWXUHV
,QILOWUDWLRN
2SHQ &KDQQHO 6\VWHP
%RG
:HWODQG
@ 3DUNLQJ
@ %03 *DWH
6WRUP 'UDLQ
+\GUDXOLF &RQQHFWLRQ
$FFHVV WR W

Maryland Transportation Authority

0DS 3UHSDUHG
'DWD 6RXUFHV 0'7$ 13'(6 'DWD
%DVH 0DS (VUL ,PDJHU\

)HHW