



March 30, 2021

Maryland Department of the Environment  
Water Management Administration  
Regulatory Services Coordination Office  
1800 Washington Boulevard, Suite 430  
Baltimore, Maryland 21230-1708

RE: Nontidal Wetlands and Waterways Application No 20-NT-1398/202061983

Dear Ms. Valdez:

Baltimore-Washington Rapid Rail (BWRR) proposes to develop the Baltimore-Washington Superconducting Magnetic Levitation (SCMAGLEV) Project (Project) between Baltimore, Maryland, and Washington, DC. The Project area includes portions of Baltimore, Howard, Anne Arundel, and Prince George's counties, Maryland, and crosses two Tier II Catchment watersheds (Beaverdam Creek 2 and Patuxent River 1). BWRR is applying to the Maryland Department of the Environment (MDE), Nontidal Wetlands and Waterways Division for a Nontidal Wetlands and Waterways Permit and State Water Quality Certificate to authorize activities associated with the proposed Project.

Attached please find the requested Tier II Documentation:

- Tier II No Discharge Alternative Analysis Form and Narrative
- Tier II Social and Economic Justification Narrative

If you have any questions or comments on this application or require any additional information, please contact Kris Frederes, BWRR Project Manager, at 443-759-8360 or via email at [KFrederes@bwrapidrail.com](mailto:KFrederes@bwrapidrail.com). We thank you for your prompt attention to this request.

Kind regards,

**Furqan Siddiqi**  
Executive Vice President

Encl.  
cc: Branden Bracher, FRA  
Pam McNicholas, WSP  
Larry Pesesky, WSP

# BALTIMORE-WASHINGTON SCMAGLEV PROJECT

Maryland High-Quality Waters (Tier II)

Antidegradation Review Form

Alternatives Analysis – No Discharge Alternative

REVISION: 0

DATE: March 29, 2021





Maryland Department of the Environment

Antidegradation Review Report Form  
**Alternatives Analysis - No Discharge Alternative**



**Purpose**

This form is designed to help applicants assemble a complete Tier II Review report. This form specifically addresses evaluating alternatives that avoid impacts to Tier II watersheds and streams. It is strongly recommended that applicants complete this analysis as early in the project planning stages as possible, during initial property site search and screening analysis of purchase and feasibility alternatives.

The Department will use this information to determine whether or not an adequate alternatives analysis was conducted, and to help determine if a reasonable alternative to the proposed activity is available. MDE may provide additional comments during the course of the review.

**Fill in all that apply:**

1. **Project Name:** Baltimore Washington SCMAGLEV Project

2. **County ESC Plan Identifier:** \_\_\_\_\_

3. **Nontidal Wetlands & Waterways Construction Tracking Number:** 20206\_ \_ \_ \_

4. **General Permit Number:** 20-NT-1398 (AI: 170244)

5. **Other Application Type and Number:** \_\_\_\_\_

**Applicant Signature:** \_\_\_\_\_ **Date Complete:** 3/29/21

**Background**

Code of Maryland Regulations (COMAR) 26.08.02.04-1 (G(1)) states that "If a Tier II antidegradation review is required, the applicant shall provide an analysis of reasonable alternatives that do not require direct discharge to a Tier II water body (no-discharge alternative). The analysis shall include cost data and estimates to determine the cost effectiveness of the alternatives".

For land disturbing projects that result in permanent land use change, this 'no discharge' analysis specifically evaluates the reasonability of other sites or alternate routes which could be developed to meet the project purpose, but are located *outside* of the Tier II watershed. Reasonability considerations, as applicable, may take into account property availability, site constraints, natural resource concerns, size, accessibility, and cost to make the property suitable for the project. This analysis shall be performed regardless of whether or not the applicant has ownership or lease agreements to a preferred property or route.

Information from this analysis may be used to inform minimization analysis.

### Instructions and Notes

1. Complete the analysis for each Tier II watershed impacted.
2. Review the information in this document carefully. Prepare a report to address all of the analyses required by this document. Submit all Tier II analysis and documentation at one time.
3. To help improve review efficiency and avoid delays, do not leave any response blank. Please use "N/A" for any questions or sections that are not applicable.
4. Provide sufficient supporting documentation for narratives.
5. The level of analysis necessary, and amount of documentation that may be needed to make a decision is dependent upon project size, scope, and scale of relative impacts to Tier II resources. Please develop responses accordingly.
6. Reports/responses shall be submitted in electronic format, as well as paper. Full plans are not required unless requested over the course of the review.
7. Direct any questions regarding this form to Angel Valdez at [angel.valdez@maryland.gov](mailto:angel.valdez@maryland.gov), or by phone at 410-537-3606.

### No Discharge Alternative Analysis Final Documentation Checklist

- Signed & Dated MDE Tier II Alternatives Analysis – No Discharge Alternative form (page 1)
- Qualifying Exemptions with supporting documentation
- General Project Purpose Statement with relevant definitions
- Alternative Site Reasonability Analysis N/A
  - Results of initial site search
  - Map of alternatives relative to preferred site and Tier II streams/catchment
  - Alternative Sites Summary Analysis Table Supplementary Information (per site)
  - Detailed Narrative of Alternate Analysis Outcome
- Alternative Route Reasonability Analysis
  - Results of initial site search
  - Map of all alternatives relative to preferred route and Tier II streams/catchment
  - Alternative Sites Summary Analysis Table Supplementary Information (per site)
  - Detailed Narrative of Alternate Analysis Outcome
- Narrative rationale for final decision of reasonableness

## Qualifying Exemptions

For the purposes of the no discharge analysis for land disturbing activities, extenuating circumstances may apply to projects that are developed to address a specific need, may be linked to special funding, or linked to a specific location. Supporting documentation is required before consideration. Please read the following examples and determine whether or not a given situation is applicable.

The applicant must get concurrence from MDE as to the applicability of any special circumstances prior to completing the no discharge alternatives analysis. It is at the Department's discretion to determine whether a special circumstance applies, and whether or not this applicability means that there is not a reasonable alternative that avoids the Tier II watershed.

If none of the special circumstances apply, check "**Not Applicable**".

### Not Applicable

#### **Situation 1:** Project is linked to unique or special incentives for State, County, or Municipality

Example: County needs for 1000 units of low-income senior housing in legislative district 7. Documentation must include the request for proposals (RFP) or similar missive to meet the housing need, and unique benefits or incentives lost if the project is moved outside of legislative district 7.

Example: Project is located in a State Designated Priority Funding Area, State Designated Enterprise Zone, or similar area targeted by the State for economic growth, business development, or investment.

#### **Situation 2:** Project has location specific limitations

Example: College campus extension. Education capital funding limits development to sites that are within 5 miles of the main campus. Documentation should include the RFP or similar documentation.

Example: Project is taking place in an existing right of way, or using an area that is currently operational. Such projects include replacing transmission lines, expanding operations on a working farm or business center.

#### **Situation 3:** Military project (or similar) with restrictions due to national security, etc.

Example: Construct a new runway and hangar for Air Force 1. The military may identify a certain location or base where this construction shall occur due to existing facilities, support personnel, and security concerns.

#### **Situation 4:** Project has little to no resource impacts.

Example: Repair or replacement of existing structures, road resurfacing, bridge maintenance using scaffolding, General Waterways Construction Permits, habitat restoration, rehabilitation, and stabilization.

#### **Situation 5:** Project is a "Grandfathered" development, that meets the specifications within Chapter 1.2, in the *Maryland Model Stormwater Management Ordinance, June 2009 & April 2010*

Administrative waivers, extension documentation, etc. are required documentation.

Note -This exemption does not apply to linear projects like roads or pipelines. Grandfathered projects are not exempt from the minimization alternatives analysis.

## General Project Purpose Statement

1. Define the overall project purpose and site selection criteria. To result in a fair and meaningful analysis for the antidegradation review the site selection criteria must fall into the following parameters:
  - a. The statement must not be so narrowly constructed as to limit the results to one site with no other possible alternatives, or
  - b. Likewise, the statement cannot be too broadly written creating too many alternatives to effectively consider.
2. Example Statements
  - a. Too Narrow: To develop a high density residential housing complex consisting of 1000 living units on a 200 acre site adjacent to the Mall of Maryland. -- The likelihood that there are multiple properties other than the desired alternative available are unlikely, and this eliminates the possibility of properties outside of the Tier II watershed.
  - b. Too Broad: To develop a residential housing complex in Charles County. -- This will yield hundreds of results, creating a burdensome and unrealistic amount of work to evaluate each alternative.\*\*
  - c. Reasonable: To develop a residential housing complex near a major shopping center in Northern Charles County. -- This will reduce the number of available properties to a more manageable amount, while still meeting the overall purpose of providing housing near a retail center in a target geographic area. The applicant can further refine the statement by defining "near", "major shopping center", and "Northern Charles County".
3. The applicant must craft a statement that yields at least 3 available alternative properties for further evaluation.
4. The level of detail for the alternative analysis process should appropriately match the complexity of the project taking into consideration factors such as resource impacts to Tier II watersheds in terms of impervious cover, forest cover loss, riparian buffer impacts, public comment, etc. For example, the amount of documentation provided for 3 alternatives to place a single dwelling on one acre is expected to be significantly less than the documentation expected for a 300 acre mixed-use development.

\*\*Based on comments received during the review or other mitigating circumstances, the Department may require the applicant to evaluate additional alternatives, or provide a more in-depth analysis.

**Alternative Route Evaluation Summary Analysis Table for Super Conducting Magnetic Levitation (SCMAGLEV) Baltimore – Washington Highspeed Transportation Project (Linear Project)**

Alternative Site:	J						J1					
Alignment:	J-01	J-02	J-03	J-04	J-05	J-06	J1-01	J1-02	J1-03	J1-04	J1-05	J1-06
Station:	Cherry Hill	Cherry Hill	Cherry Hill	Camden Yards	Camden Yards	Camden Yards	Cherry Hill	Cherry Hill	Cherry Hill	Camden Yards	Camden Yards	Camden Yards
Train Maintenance Facility:	MD 198	BARC East	BARC West	MD 198	BARC East	BARC West	MD 198	BARC East	BARC West	MD 198	BARC East	BARC West
Availability:												
ROW Owned by Applicant	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties	NO - BWRR does not currently own property where the project is proposed; however, the project area is proposed to intersect with several ROW properties owned by the state, city, or counties
ROW can be acquired or leased	YES											
Other	Note that a portion of this project is tunneled below the surface and property does not need to be acquired for these areas; however, an easement will need to be acquired for these areas.											
Accessible Utilities												
Electric	YES											
Water	YES											
Sewer or Pipeline	YES											
Site Access (existing road/bridge, etc.)	YES											
None												
Zoning												
Appropriate	YES											
Waiver Required	YES											
Resource Impacts												
Stream	YES											
Forest	YES											
Wetlands/Wetland Buffer	YES											
100-YR Floodplain	YES											
Cost to Acquire is Reasonable	YES	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	NO

**Alternative Route Summary Analysis Table Supplementary Information:**

1. Explanation of route search criteria and rationale.
  - a. Relate project requirements to the criteria in Table 1.
  - b. Include any additional critical criteria not identified in the above table. For example, if the purpose of the project is to improve public safety, documentation must be provided to support this claim. For a new road this may include data on accidents, visibility issues, or geometric design issues that can complicate travel.
2. Results of initial route search.
  - a. List the available routes for consideration before the applicant chose 3 for further evaluation.
  - b. Include a brief narrative description of each route.
  - c. Include a table listing route start and end addresses, parcel and map, land use (i.e. residential neighborhood, commercial district, etc.)
  - d. Include an overview map showing results and their relative location within the impacted Tier II watershed.
3. Expand upon the responses in Table 1.
  - a. Include a narrative that clearly explains how the applicant determined the final 3 sites for further consideration in Table 1.
  - b. Provide basic information about each site, i.e. land use, land cover, unique features, on-site resources such as streams, wetlands, etc.
  - c. Discuss specific resource impacts.
    - i. Include a table that further breaks down the resource impacts associated with the 3 alternative routes. For example identify the number of streams on-site, potential forest loss for site clearing, etc.
    - ii. Include a narrative that further details whether resources could be avoided. For example, an on-site stream that will most likely be crossed to accommodate site access would make that site less favorable when compared to another option. Note: In making a final decision, MDE may take into consideration whether or not the project can avoid the impact by going over it (i.e. bridge) or under it (i.e. drilling). Consider this in the resource impact evaluation. The method of crossing may be a special permit condition.
4. Justify final route decision.

Provide a hardcopy responses to:

Maryland Department of the Environment  
Environmental Assessment and Standards Program  
Antidegradation Implementation Coordinator  
ATTN: Angel D. Valdez  
1800 Washington Blvd  
Baltimore, Maryland 21230

Provide an electronic response, by CD to the address above, or a way to download the response from secure cloud-based site, email: to Angel Valdez at [angel.valdez@maryland.gov](mailto:angel.valdez@maryland.gov).

# BALTIMORE-WASHINGTON SCMAGLEV PROJECT

Maryland High-Quality Waters (Tier II)

Antidegradation Review Report

Alternatives Analysis – No Discharge Alternative

REVISION: 0

DATE: March 29, 2021



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Revision 0: 2021-03-29

FILE NAME: SCMAGLEV\_Tier\_II\_No\_Discharge-To\_MDE-21.03.18.Docx



# 1. INTRODUCTION

Maryland High-Quality Waters Tier II Antidegradation review is required for land-disturbing projects that result in permanent land-use change. This analysis evaluates the reasonability of sites or alternate routes that do not require direct discharge to a Tier II water body (no-discharge alternative) meet the project purpose. Reasonability considerations, as applicable, may consider property availability, site constraints, natural resource concerns, size, accessibility, and cost to make the property suitable for the project. This analysis shall be performed regardless of whether the applicant has ownership or lease agreements to a preferred property or route.

## 2. PROJECT OVERVIEW

### 2.1 GENERAL PROJECT PURPOSE

Baltimore-Washington Rapid Rail (BWRR) plans to build the Baltimore-Washington Super Conducting Magnetic Levitation (SCMAGLEV) project (Project), a new High-Speed system between Washington District of Columbia (Washington, D.C.) and Baltimore MD with an intermediary stop at B Baltimore-Washington International Thurgood Marshall Airport (BWI Airport). It will provide new infrastructure, passenger stations, and other ancillary facilities for the SCMAGLEV system. As stated in the Draft Environmental Impact Statement (DEIS) “Purpose and Need” (DEIS, Chapter 2):

*The purpose of the SCMAGLEV Project is to evaluate, and ultimately construct and operate, a safe, revenue producing, high-speed ground transportation system that achieves the optimum operating speed of the SCMAGLEV technology to significantly reduce travel time in order to meet the capacity and ridership needs of the Baltimore-Washington region.*

### 2.2 SCMAGLEV PROJECT CRITERIA

To achieve the operational and safety metrics, the SCMAGLEV Project must include:

- 1) Infrastructure, vehicles, and operating procedures required for the SCMAGLEV system,
- 2) An alignment that allows the highest practical speed that can be attained by SCMAGLEV technology at a given location and which avoids the need for reduction in speed other than that imposed by the normal acceleration and braking curves into and out of stations,
- 3) A system that complies with Federal safety requirements, and
- 4) Avoidance, minimization, and mitigation of impacts to the human and natural environment.

The objectives of the SCMAGLEV Project are to:

- 1) Improve redundancy and mobility options for transportation between the metropolitan areas of Baltimore and Washington, D.C.,
- 2) Provide connectivity to existing transportation modes in the region (e.g., heavy rail, light rail, bus, and air), and
- 3) Provide a complementary alternative to future rail expansion opportunities on adjacent corridors.

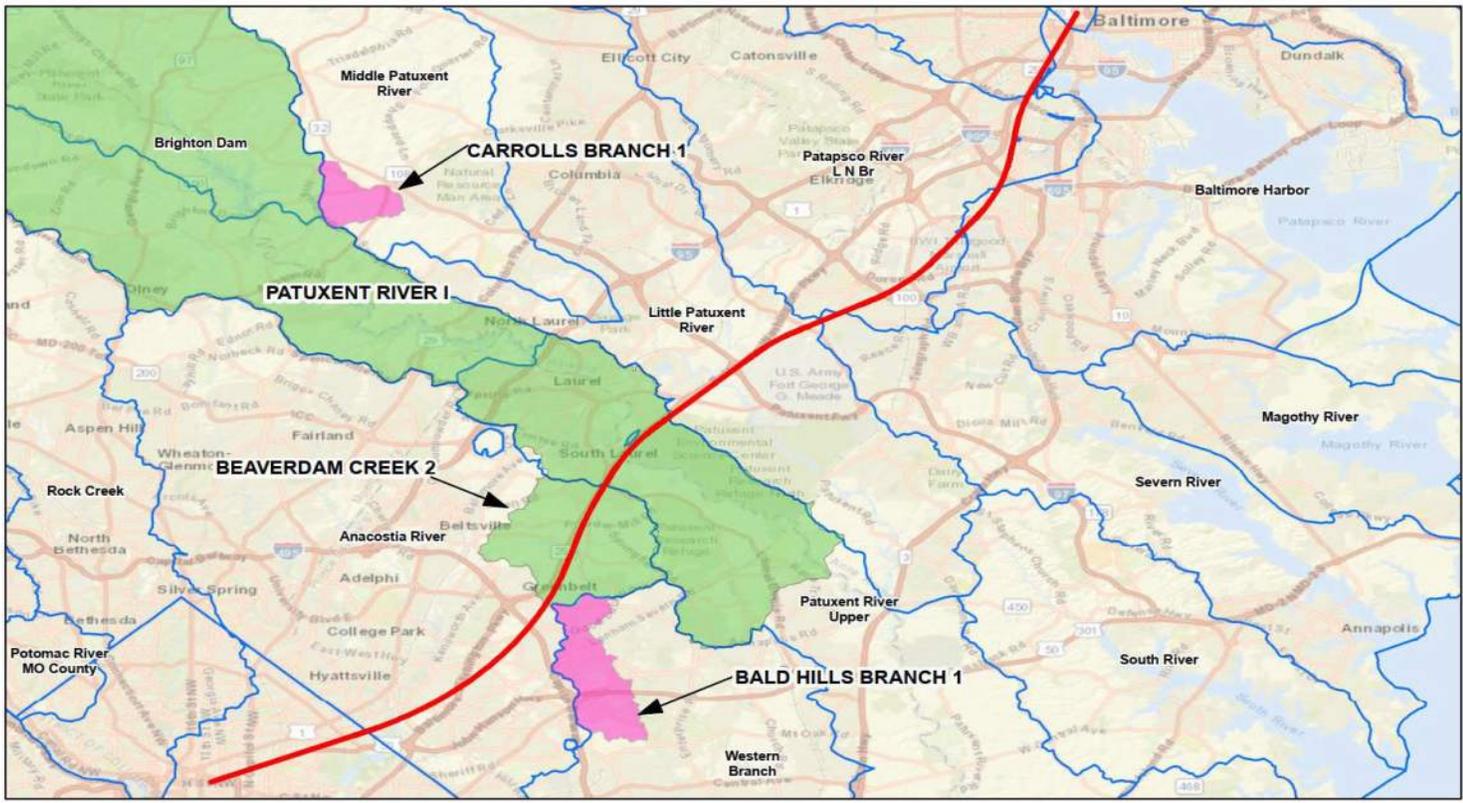
### 2.3 BWRR’S PROPOSED PROJECT

BWRR’s proposed SCMAGLEV project includes the following components:

- 1) Washington, D.C. passenger station in Mount Vernon East,
- 2) Alignment J (which is 70% tunnel and 30% above-ground viaduct that runs along the eastern edge of the Baltimore-Washington Parkway (BWP),
- 3) Train maintenance facility (TMF) located on United States Department of Agriculture Beltsville Agricultural Research Center (USDA BARC) land west of the Baltimore Washington Parkway,
- 4) BWI Airport passenger station, and
- 5) Baltimore passenger Station in the Cherry Hill neighborhood.

The TMF is among the most important Project ancillary facilities which allows for daily maintenance and inspection of both the guideways and trainsets. **Map #1:** BWRR’s Preferred Alignment J-03 shows BWRR’s Preferred Alignment (J-03), Tier II Catchment watersheds, and federal 8-digit watersheds.

Map #1: BWRR's Preferred Alignment J-03



<p><b>Tier II Catchments</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #ff69b4; border: 1px solid black; margin-right: 5px;"></span> No Assimilative Capacity</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #90ee90; border: 1px solid black; margin-right: 5px;"></span> Assimilative Capacity</li> <li><span style="display: inline-block; width: 15px; height: 15px; border: 1px solid blue; margin-right: 5px;"></span> 8-Digit Federal Watersheds</li> </ul>		<p><span style="display: inline-block; width: 20px; height: 2px; background-color: red; border: 1px solid black; margin-right: 5px;"></span> BWRR's Preferred J-03 Alignment</p>	<p><b>Maglev Tier II Catchments and Watersheds Map</b> March 2021</p> <p>N</p> <p>0 3 6 9 Miles</p>
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### 3. QUALIFYING EXEMPTION #2

The following information is provided to demonstrate adequate rationale and documentation that the Project is exempt from the no-discharge alternatives analysis. To exempt the Project from the 'Alternative Analysis No Discharge Alternatives,' BWRR, LLC., the project applicant, will demonstrate that it meets the criteria for Situation #2, there is no alternative location available, and the Project has location specific limitations:

- 1) The Study area for the project was mandated by the funding source for the project and includes Tier II Catchment watersheds.
- 2) SCMAGLEV technology requirements complying with Federal safety requirements.
- 3) No reasonable alternative alignment outside of the Tier II Catchment watersheds.

#### 3.1 STUDY AREA MANDATED BY THE FUNDING SOURCE

In 2005, Congress passed the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), authorizing funding to study magnetic levitation transportation projects (Section 1307 of the SAFETEA-LU Act (P.L. 109-59, 2005). The Federal Railroad Administration (FRA) identified the Baltimore-Washington corridor as the location for FRA's evaluation of a magnetic levitation project due to the area's high level of congestion, economic importance, increased development, and the need for connectivity between the two cities.

FRA has jurisdiction over all railroads, as defined in 49 U.S.C. 20102, except urban rapid transit operations that are not connected to the general railroad system of transportation, and broad authority to prescribe regulations and issue orders, as necessary, for every area of railroad safety (49 U.S.C. 20101 et seq.; 49 C.F.R. § 1.89, Parts 200-299). In addition, FRA is providing funding for Project planning under Section 1307 of The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Act (P.L. 109-59, August 10, 2005), which authorized funding for a SMAGLEV project, defined as transportation systems employing magnetic levitation that would be capable of safe use by the public at a speed in excess of 240 miles per hour. The corridor chosen by Maglev Deployment Program (MDP) grant is the Baltimore-Washington corridor, which limits the study area for the Project. Additionally, the Maglev technology used for the project requires the project is constructed to maintain the speed of 300 miles per hour which results in the restriction on the alignment curves to a minimum 8000 meters, which further restricts project placement. In accordance with the requirements for MDP funding, BWRR must focus the placement of the project and all alternatives within the mandated study area as described below.

The SCMAGLEV MDP grant prescribed study area as outlined in the Federal Register / Vol. 81, No. 227 / Friday, November 25, 2016 / Notices:

*The proposed study area is roughly bounded on the west by Interstate 95 and on the east by the former Washington-Baltimore & Annapolis Electric Railroad alignment. It includes portions of the City of Baltimore, Baltimore County, Howard County, Anne Arundel County, and Prince George's County in Maryland, and Washington, D.C. (Map #2 below shows the study area).*



## 3.2 SCMAGLEV TECHNOLOGY REQUIREMENTS

The MDP grant is specific to the use of Maglev-based technology, which is the SCMAGLEV transportation technology developed by the Central Japan Railway Company (JRC), but not currently in operation in the United States.

Unlike typical electric trains in service in the United States, a SCMAGLEV system does not operate on standard steel railroad tracks. SCMAGLEV trains levitate between the walls of a unique U-shaped concrete structure, known as a guideway, which has walls surrounding the trains on both sides, which prevents the SCMAGLEV system from derailment. Powerful superconducting magnets on the trains and propulsion coils in the guideway walls generate the acceleration forces that drive the SCMAGLEV system, resulting in traveling speeds of over 300 miles per hour. Direct links to power substations transfers the electrical power needed to operate the SCMAGLEV system along the guideway.

SCMAGLEV technology requires a grade-separated fixed guideway to operate. Grade-separated means that the guideway does not have ground level intersections with other transportation networks. It is either elevated above ground on a structure (viaduct) or below ground in a tunnel and is physically separated from existing roadways and railroads.

As part of the SCMAGLEV design criteria adopted for the Project to maintain the speed of 300 miles per hour, the alignment curve has a minimum radius of 8,000 meters. The ‘Purpose and Need’ statement of the Project cannot be met without adhering to this requirement. This requirement imposes location-specific restrictions on the placement of the alignment, supporting that the Project qualifies for an exemption to the Alternative Analysis - No Discharge Alternative under Situation 2; Project has location specific limitations.

## 3.3 Conclusion – Qualifying Exemption

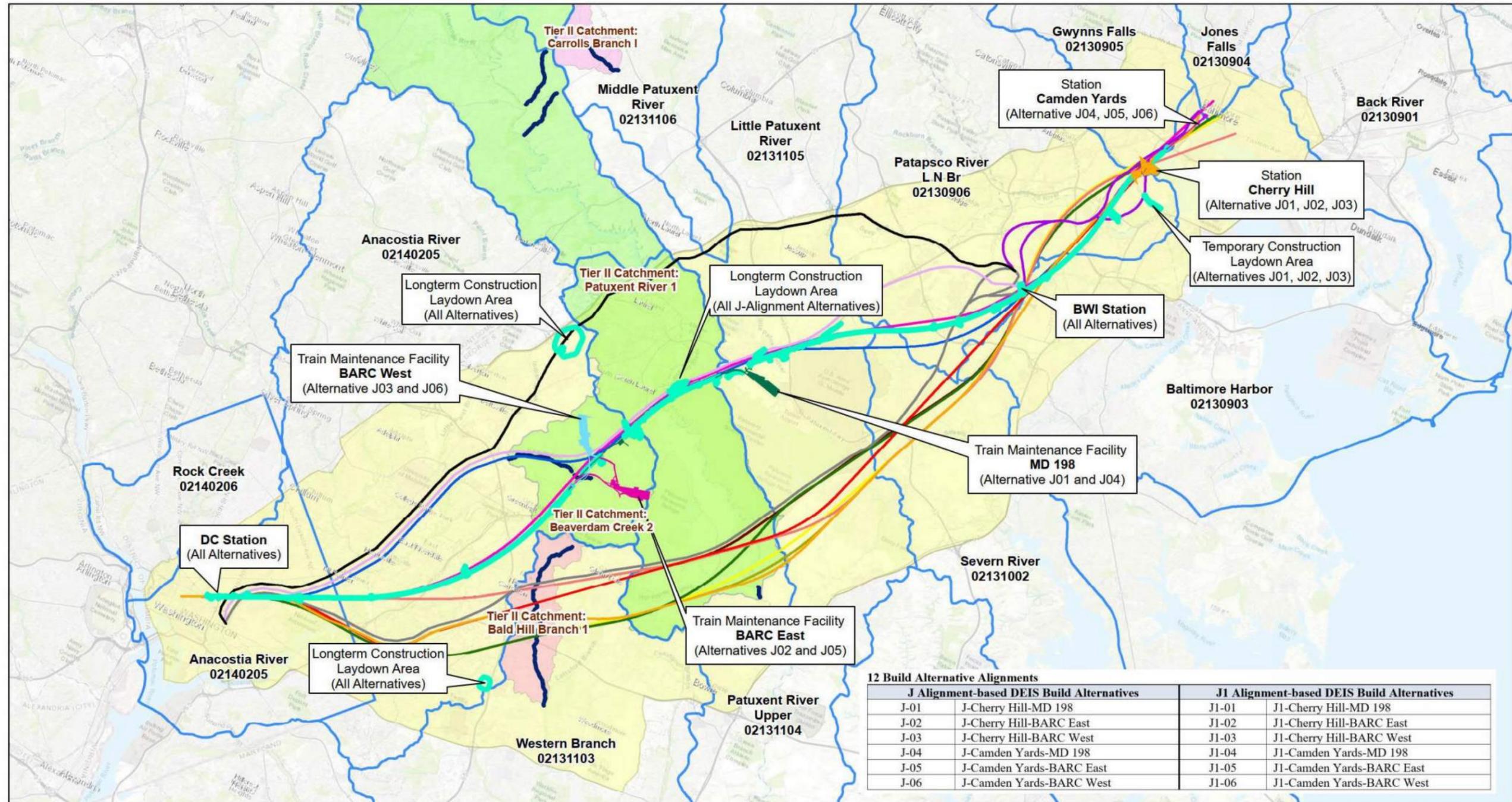
In summary, there are no reasonable or feasible alternatives that would avoid Tier II Catchment watersheds while meeting the Project’s purpose and need and are within the FRA mandated study area. Although a small portion of the FRA study area falls outside of Tier II Catchment watersheds, it is not operationally feasible to extend the Project from Washington, D.C. to Baltimore and curving the alignment to the southeast to avoid Tier II impacts. The SCMAGLEV design criteria to maintain speed of 300 miles per hour restrict the ability to implement alignment curvature, the SCMAGLEV technology requirements and restrictions do not meet the Project’s purpose and need. For these reasons, the SCMAGLEV project qualifies for an exemption to the Alternative Analysis - No Discharge Alternative under Situation 2; Project has location specific limitations.

## 4. ALTERNATIVE ROUTE REASONABILITY ANALYSIS

The Preliminary Alternatives Screening Report (PASR) published in January 2018, had evaluated 14 route alternatives that were in the study area and met the technology requirements. All but two alignments (J and J1) were eliminated from further study. All alignment options passed through Tier II Catchment watersheds, and some through Tier II Catchment watersheds without assimilative capacity.

### 4.1 NO ALTERNATIVE OUTSIDE TIER II CATCHMENT WATERSHEDS

Map 3 shows the SCMAGLEV Project Initial and Build Alternative Alignments that were considered.



**12 Build Alternative Alignments**

J Alignment-based DEIS Build Alternatives		J1 Alignment-based DEIS Build Alternatives	
J-01	J-Cherry Hill-MD 198	J1-01	J1-Cherry Hill-MD 198
J-02	J-Cherry Hill-BARC East	J1-02	J1-Cherry Hill-BARC East
J-03	J-Cherry Hill-BARC West	J1-03	J1-Cherry Hill-BARC West
J-04	J-Camden Yards-MD 198	J1-04	J1-Camden Yards-MD 198
J-05	J-Camden Yards-BARC East	J1-05	J1-Camden Yards-BARC East
J-06	J-Camden Yards-BARC West	J1-06	J1-Camden Yards-BARC West

**SCMAGLEV Project Initial and Build Alternative Alignments**

March 2021

**Initial Alignments**

- A - I-95 Parallel
- B - BW Parkway
- C - Amtrak Parallel
- D - Linthicum/City Options
- E - Amtrak
- E1 - Amtrak Modified
- F - BWP

- G - WBA
- G1 - WBA Modified
- H - WBA to Amtrak
- I - Amtrak to WBA
- I1 - Amtrak Modified to WBA
- J1 - BWP Modified West

**Tier II Watersheds**

- No Assimilative Capacity
- Assimilative Capacity
- Tier II Stream Segments
- 8-Digit Federal Watersheds
- FRA Study Area

**Construction and Station Features**

- TMF - BARC West
- TMF - BARC East
- TMF - MD 198
- Station - Cherry Hill
- Station - Camden Yards

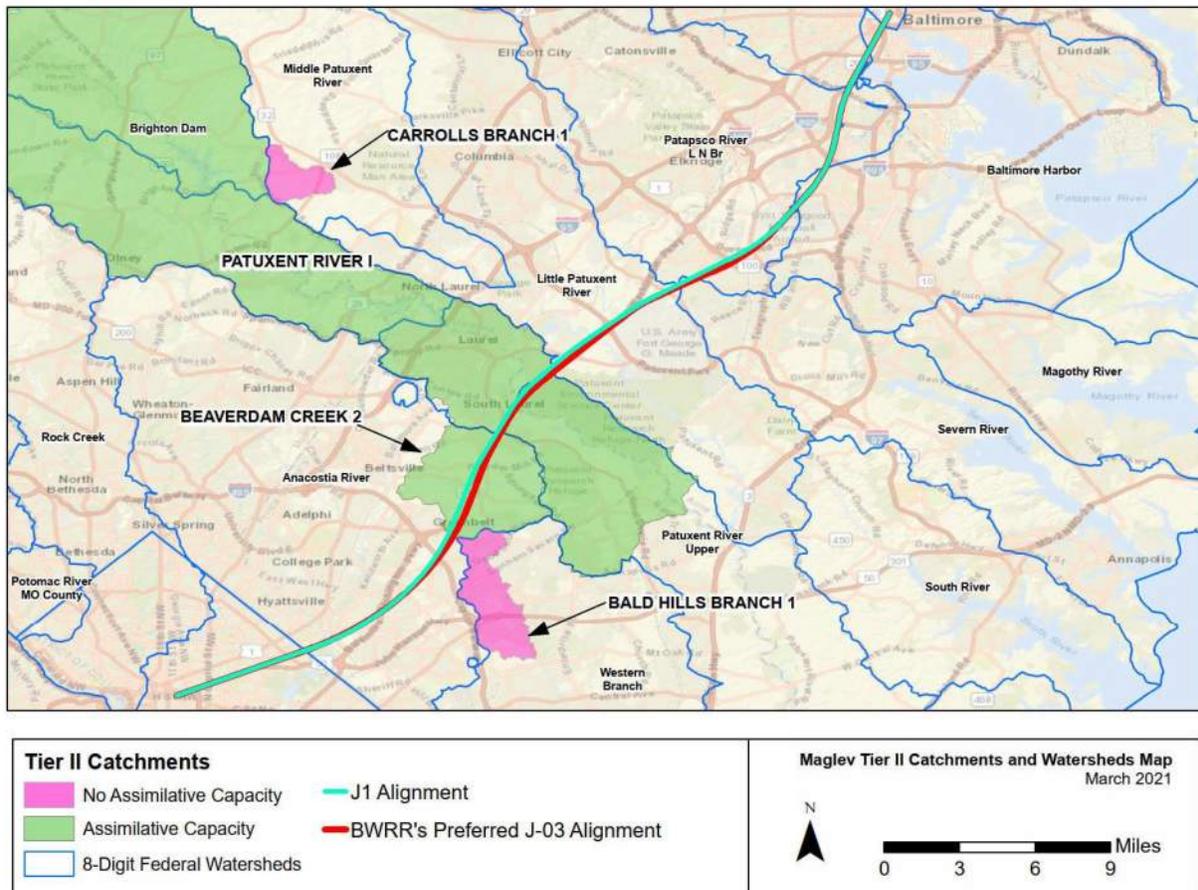
0 2 4 6 Miles

## 4.2 REMAINING ALIGNMENT ALTERNATIVES

After the elimination of alternatives through PASR and then further refined in the Alternatives Retained for Detailed Study (ARDS), two alignments and two Baltimore station options remained.

Both alignments transition from a deep tunnel to a viaduct between the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center overpass and Beaver Dam Road in Greenbelt. Notable landmarks in this area include the USDA BARC, NASA Goddard Space Flight Center, the eastern end of the City of Greenbelt, and the Patuxent Research Refuge (PRR). The alignments continue into Anne Arundel County, near Laurel, and runs adjacent to Fort George G. Meade on the east of the BWP and near Maryland City Park on the west side. The viaduct transitions back to a tunnel in the vicinity of Fort George G. Meade for the eastern Build Alternatives J and just east of Brock Bridge Elementary School for the western Build Alternatives J1. Both alignments, now in a deep tunnel, become concurrent just north of MD 175 and pass under the BWI Airport. **Map #4** shows the two alignment routes.

**Map #4: BWRR's Preferred Alignment J and Alignment J1**



## 5. ALTERNATIVE SITE REASONABILITY ANALYSIS

The remaining Build Alternatives represent combinations of different alignments (J and J1), Baltimore passenger station (Cherry Hill and Camden Yards), and trainset maintenance facility (TMF, BARC West, BARC East, and MD 198) options. This results in 12 Build presented in the SCMAGLEV DEIS in Table #1.

The TMF has its own set of technology requirements which limits where along the alignment it can be located and is further described in the Joint Permit Application Exhibit J – Trainset Maintenance Facility Alternatives.

**Table 1: Build Alternative Alignments**

J Alignment-based DEIS Build Alternatives		J1 Alignment-based DEIS Build Alternatives	
J-01	J-Cherry Hill-MD 198	J1-01	J1-Cherry Hill-MD 198
J-02	J-Cherry Hill-BARC East	J1-02	J1-Cherry Hill-BARC East
J-03	J-Cherry Hill-BARC West	J1-03	J1-Cherry Hill-BARC West
J-04	J-Camden Yards-MD 198	J1-04	J1-Camden Yards-MD 198
J-05	J-Camden Yards-BARC East	J1-05	J1-Camden Yards-BARC East
J-06	J-Camden Yards-BARC West	J1-06	J1-Camden Yards-BARC West

All the Build Alternatives cross through Tier II Catchment watersheds. None of the Build Alternatives are water dependent.

## 6. RATIONAL FOR DECISION OF REASONABLENESS

Based on BWRR's evaluation, DEIS Build Alternative J-03 is the least environmentally impactful alternative that also meets the stated intent of the Maglev Deployment Program. There are no alternatives that meet the project purpose and need while avoiding Tier II Catchment watersheds.

For a more comprehensive explanation of BWRR's selection of J-03, see the following documents submitted with the SCMAGLEV JPA:

- Exhibit E – Avoidance Minimization and Impacts Report
- Exhibit F – Alternative Site Analysis
- Exhibit I – BWRR's Proposal for Preferred Alternate
- Exhibit J – Trainset Maintenance Facility (TMF) Alternatives

Additional supporting information can be found in the SCMAGLEV DEIS January 2021 <https://bwmaglev.info/project-documents/deis>



# BALTIMORE-WASHINGTON SCMAGLEV PROJECT

Maryland High-Quality Waters (Tier II)  
Social and Economic Justification Report

REVISION: 0  
DATE: March 29, 2021





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# 1. INTRODUCTION

## 1.1 PROJECT SUMMARY

The Baltimore-Washington Superconducting Maglev (SCMAGLEV) Project plans to build a new High-Speed Rail line between Washington D.C. and Baltimore, MD with an intermediary stop at Baltimore-Washington International Airport (BWI Airport). The project will provide new infrastructure, passenger stations and other ancillary facilities for the SCMAGLEV system. Of twelve different Build Alternatives presented in the Federal Railroad Administration’s (FRA) Draft Environmental Impact Statement (DEIS), Baltimore Washington Rapid Rail’s (BWRR) preferred alignment and project proposal is Build Alternative J-03 which includes the Washington D.C. station in Mount Vernon East, Alignment J (which is 70% tunnel and 30% above-ground viaduct that runs along the eastern edge of the Baltimore-Washington Parkway); a train maintenance facility (TMF) located on United States Department of Agricultural Beltsville Agricultural Research Center (USDA BARC) land west of the Baltimore Washington Parkway; and a Baltimore City Station in the Cherry Hill neighborhood.

## 1.2 IMPACTS

The overall impacts assessment of Build Alternative J-03 to the Tier II Catchment watersheds is currently being compiled. Based on GIS work to date the following table summarizes impacts to Tier II Catchment watersheds for total permanent and temporary impacts to forest cover, wetlands, and waterways.

Build Alternative	Total Impact Type	Tier II Catchment Watersheds		
		Beaverdam Creek 2	Patuxent River 1	Total (Acres)
J-03	Forest Impacts	255	56	311
	Wetland Impacts	15.6	0.4	16.0
	Waterway Impacts	1.1	7.1	8.2

NOTE: The project footprint within the Beaverdam Creek and Patuxent River catchments is 703 and 78 acres, respectively.

## 1.3 ANTIDegradation POLICY

The Maryland antidegradation implementation procedures are found in the Code of Maryland Regulations (COMAR) 26.08.02.04-1 (J). These regulations also require the State to maintain high-quality (i.e., Tier II) waters that have water quality better than the minimum standard necessary to meet designated uses. Assimilative capacity (AC) is defined as the difference between the Tier II water quality criterion and the stream segment when it was designated as Tier II. In this instance, the water quality criterion is a benthic and fish Index of Biotic Integrity (IBI) of 3.00. The Tier II baseline IBI score is the score used to identify the stream as high quality<sup>1</sup>.

The assimilative capacity analysis allows the Maryland Department of the Environment (MDE) to evaluate recent Maryland Biological Stream Survey (MBSS) data to determine whether Tier II water quality has either been maintained or diminished. Regulations specify that Tier II water quality is considered

<sup>1</sup>[https://mde.maryland.gov/programs/water/tmdl/waterqualitystandards/pages/antidegradation\\_policy.aspx](https://mde.maryland.gov/programs/water/tmdl/waterqualitystandards/pages/antidegradation_policy.aspx)



diminished if the AC is reduced by more than 25% from the original Tier II designation baseline. This analysis identifies the Tier II stream's assimilative capacity threshold and the lowest acceptable benthic and fish IBI scores, after considering natural variability. When data is above the assimilative capacity threshold, MDE determines that there is some capacity remaining. Conversely, if there is a decline in scores to a level at or below the AC threshold, the stream is determined to have no remaining assimilative capacity.

*Assimilative capacity (AC) is defined as the difference between the Tier II baseline index of biotic integrity (IBI) score and the Tier I water quality IBI threshold. The assimilative capacity analysis allows MDE to evaluate recent MBSS data to determine whether Tier II water quality has been degraded. The Tier I water quality IBI threshold for biological water quality is 3.00. The baseline is the IBI score used to designate a stream as Tier II. On a scale of 1.00 to 5.00, any Tier II baseline IBI score (separately for both fish and benthos) must be greater than or equal to, 4.00.*

MDE has determined that the Beaverdam Creek 2 and Patuxent River 1 Tier II Catchment watersheds both have assimilative capacity, indicating that the streams are healthy and have not been degraded since the original designation as a Tier II Catchment watersheds<sup>2</sup>.

## 1.4 DOCUMENT PURPOSE

This document demonstrates that any environmental hardships faced because of impacts to Tier II waters are significantly less than the public benefit derived from the SCMAGLEV project, both economic and environmental. Socioeconomic Contributions of the Project:

### 1.4.1 ECONOMIC IMPORTANCE AND BENEFITS:

*1.4.1.1 Method of financing and categorized project costs:* Financing will come from a mix of sources. Japan is expected to cover a significant portion of the Baltimore-Washington SCMAGLEV cost. The remainder of funding will come from U.S. government loan and grant programs, and the private sector. We do not anticipate any cash investment, loans, or annual operating subsidy from the State of Maryland at this time. Specifically related to Tier II Catchment watersheds, the single largest SCMAGLEV installation will be the Train Maintenance Facility (TMF) (DEIS Appendix G9 *Capital and Construction Costs Memorandum*). The project alignment and ramps to the TMF will also be in the Tier II Catchment watershed but will have relatively minor impacts compared to the TMF.

*1.4.1.2 Annualized cost of minimization implementation of estimated life of project:* This project has an over 50-year life expectancy and determining costs over this period requires BWRR to have a designated preferred alternative selected by the FRA during the Final Environmental Impact Statement (FEIS) process. Once a preferred alternative is selected, BWRR can finalize minimization discussion and engineering to better estimate the annualized cost of minimization implementation.

*1.4.1.3 Project Cost Allocation (i.e., costs related to financing that are passed along to end users:* Costs related to financing will be dependent on final preferred alignments, follow-on engineering work, and final system financing structures. Until these items are determined,

<sup>2</sup> <https://mdewin64.mde.state.md.us/WSA/TierIIWQ/index.html>



it is unknown how much costs related to financing are passed on the riders of the system. The system revenue will cover its operation and maintenance costs.

*1.4.1.4 End Users Responsible for Recouping Finance:* All financing details are subject to continued study during the FEIS process and dependent on unresolved factors including, but not limited to, the decision on a preferred alignment. Per the Federal Maglev Deployment Program mandate, the system revenue is planned to cover operating and maintenance costs.

#### **1.4.2 SOCIAL IMPORTANCE AND BENEFITS:**

The social importance and benefits of the SCMAGLEV project are widespread and include both economic and environmental gains for many of the Environmental Justice (EJ) communities near the impacted Tier II Catchment watersheds. Specifically, there are three Social and Economic Justification (SEJ) benefits of the project including (1) EJ Job creation (both with short-term construction and long-term operations); (2) improved environmental conditions including better air quality through reduction of vehicle traffic in roadways near EJ communities and reduced BARC toxic waste; and (3) building the line without bisecting residential communities.

##### *1.4.2.1 Economic Growth and Job Creation:*

According to the independently produced DEIS, the SCMAGLEV project will take approximately seven years to construct and will require 161,000 job-years of labor to build (i.e., one job-year equals one-job per person per year) (DEIS Chapter 4.6). That means there will be approximately 23,000 jobs per year for the expected seven-year construction period. According to the DEIS (4.6-16), this construction effort will cost \$13.83 billion with \$8.8 billion of that being direct labor earning. As the DEIS Chapter 4.5 *Environmental Justice* highlights, most of the communities that the SCMAGLEV alignment travels through are EJ communities. On March 1<sup>st</sup>, 2021 BWRR announced a *Diversity, Equity, and Inclusion Plan* to ensure local EJ communities reap the economic rewards of this project. The plan laid out the following construction goals: (a) at least 40% of the construction workforce will be from diverse populations in which the route travels through, and at least 25% of construction spend will be on Minority-Business Enterprises (MBEs) and Women Business Enterprises (WBEs). There will be particular emphasis to work within EJ communities and local community colleges to train and establish apprenticeships as the project progresses.

BWRR expects the TMF (again, located in Tier II Catchment watersheds) to require approximately 300 permanent jobs for long-term maintenance and operations work. Per BWRR's *Diversity, Equity, and Inclusion Plan*, at least 25% of this permanent workforce will come from diverse populations with an emphasis on providing apprenticeship pipelines to local EJ residents, and 25% of long-term operations spending will be directed toward MBEs and WBEs. By providing training and apprenticeship opportunities to local minority populations, BWRR will in the long-term provide these populations with pathways to stable well-paid jobs.

Darryl Barnes

<sup>34</sup>, endorsed the SCMAGLEV project’s plan highlighting, “*the current pandemic shows that communities of color are particularly vulnerable during hard times, which is why a project like the SCMAGLEV train offering tens of thousands of jobs and billions of dollars of investment must be taken seriously. Prince George’s will benefit from approximately 500 proposed permanent jobs making it the largest concentration of jobs along the route [...] jobseekers, contract seekers, and others will be better off thanks to these pathways for county residents to grow and sustain wealth.*”<sup>3</sup> In addition to the Mr. Barnes support the Maryland State Conference NAACP and four of its local branches (Baltimore City, Prince George’s, Anne Arundel, and Baltimore Counties), and the National Action Network have all endorsed the project. They have agreed the SCMAGLEV will bring economic EJ benefits to local communities of color traditionally overlooked by transformative investment and at a scale unparalleled in the state of Maryland.

#### 1.4.2.2 Environmental Gains:

*The SCMAGLEV project will have two important environmental benefits to EJ Communities near the BARC site (where Tier II Catchment watersheds are located): (a) improved air quality and (b) reducing toxic waste from obsolete USDA BARC Buildings.*

*Improved Air Quality:* Per the DEIS (4.2-6), SCMAGLEV is expected to divert between 11.3 million to 12.6 million cars off the road by its opening year. This translates into a 9-12% reduction in regional Vehicle Miles Travelled (VMT) (4.16-10). This reduction of car use, which will be predominantly on busy DC-Baltimore throughways like the Baltimore-Washington Parkway and I-95, will lower regional tailpipe emissions and improve regional air quality (DEIS 4.2-7). By 2045, as SCMAGLEV ridership increases, the service is expected to divert between 393 and 437 million VMT. These steep auto reductions cannot come soon enough as the EPA already notes that most of the SCMAGLEV project area is already in non-attainment status air quality<sup>5</sup>. By taking DC-Baltimore through traffic off the major roadways between Washington DC and Baltimore, EJ communities in between will benefit as there will be fewer passing cars who leave nothing in their communities except emissions, noise, and congestion.

In addition to reduced emissions, local EJ communities who might commute from Prince Georges County to DC or Baltimore will benefit from reduced Baltimore-Washington Parkway congestion on their trips. As the National Park Service *National Capital Region Long Range Transportation Plan*<sup>6</sup> makes quite clear, the region’s parkways are overly congested and unique in that they are predominantly used by regional commuters – not National Park Service visitors. While the plan notes that the Baltimore Washington-Parkway (“BW-Parkway”) has the worst traffic of the National Capital Region parkways (P.100), it presents no viable solutions for how to mitigate this traffic. In fact, the Fort Meade Alliance recently noted that while the BW-Parkway was designed for 50,000 cars per day, it now sees frequent traffic exceeding 120,000+

<sup>3</sup> David Barnes is a Maryland Delegate from Prince George’s County currently serving as Chair of the Legislative Black Caucus

<sup>4</sup> <https://msa.maryland.gov/msa/mdmanual/06hse/html/msa17067.html>

<sup>5</sup> [Nonattainment Areas for Criteria Pollutants \(Green Book\) | US EPA](#)

<sup>6</sup> [NPS PEPC - NPS National Capital Region Long Range Transportation Plan](#)

users per day<sup>7</sup>. This discrepancy shows that regional commuters, not park visitors, are the reason for parkway congestion – and these are precisely BWRR’s target population to take off National Capital Region (NCR) parkways like the BW-Parkway

*1.4.4.2.1 Regarding the proposed BARC West TMF (located in a Tier II Catchment watershed):* In January 2020, the USDA announced their intention to demolish twenty-two obsolete BARC buildings to reduce long-term operating costs<sup>8</sup>. Fourteen of these buildings would be demolished as part of BWRR’s TMF West proposal. USDA concedes that these twenty-two buildings are no longer mission critical, and their removal would have no adverse impact on BARC. Moreover, USDA notes that the buildings are dangerous containing a mix of asbestos, mercury, lead, and refrigerant among others and must be demolished for BARC’s overall safety (Sections 2.3.1; 3.6.2.2). BWRR shares the concerns with USDA regarding toxic asbestos, mercury, lead, and refrigerant leaking into the surrounding community – especially Tier II Catchment watersheds. That is why BWRR has already offered to USDA-Agricultural Research Service (ARS) that we will proactively help them remove these obsolete and dangerous buildings so that aging and leaking buildings do not spill toxins into the fragile ecosystem.

NOTE: Portions of BARC are Environmental Superfund sites. DEIS Pages 4.15-4 and 4.15-5 highlight USDA CERCLA activities at BARC.

Unlike the proposed US Department of Treasury Bureau of Engraving and Printing (BEP) facility on BARC land (see Public Law 115-334, Section 7602 (i.e. the “Farm Bill”) which will produce approximately 120,000 gallons of wastewater per day which will ultimately be discharged into nearby surface waters (BEP DEIS P.3-33, November 2020). BWRR does not anticipate generating this large amount of waste. While the SCMAGLEV DEIS does not quantify the amount of operational waste to be generated, the DEIS does note (4.15-7) that a solid waste plan is expected to be developed as the design advances and geotechnical and environmental subsurface site investigations are conducted. Waste minimization and spill prevention will be primary components of this solid waste plan.

*1.4.2.3 Not Bisecting EJ Communities:*

For over four years of planning and public engagement, BWRR has sought to avoid any residential displacements and minimize impacts to the greatest extent possible. BWRR is fully aware of the stained legacy of highway and rail construction in this country that has typically cut through poor EJ communities. Maryland road projects between 1965-1980 displaced 94,000 people from poor minority populations<sup>9</sup>. BWRR has agreed (at considerable cost) to place 70% of the project in deep tunnel to avoid residential relocations. Just as impressive is that the 30% above-ground portion is entirely next to the BW-Parkway, a roadway that has over 100,000 daily travelers. Thus, not only is BWRR not taking any homes (unlike the 94,000 displaced Marylanders of the aforementioned highway projects of the past century), but our above-ground portion is next to an existing parkway

<sup>7</sup> [Transportation – Fort Meade Alliance \(ftmeadealliance.org\)](https://www.ftmeadealliance.org)

<sup>8</sup> *Demolition of 22 Buildings at the Henry A. Wallace Beltsville Agricultural Research Center (January 2020). USDA-ARS*

<sup>9</sup> *Not in My Neighborhood: How Bigotry Shaped a Great American City (2010). Antero Pietila. Page 219*

meaning that noise and vibration concerns are already mitigated by the much noisier parkway. As the DEIS lucidly notes (4.4-4), “*the above-ground viaduct would not bisect communities.*” Moreover, the DEIS continues that all Build Alternatives, including BWRR’s preferred alignment and project proposal for Build Alternative J-03, are “*located as close to existing transportation corridors as possible. In addition, large portions of the SCMAGLEV Project have been designed as guideway tunnels, with 75 to 83 percent of the Build Alternatives located in tunnel [...] Build Alternatives largely avoid fisheries resources and migration paths associated with major stream systems and/or high-quality Tier II Waters (Anacostia, Patuxent, and Patapsco Rivers, Beaverdam Creek, Baltimore Harbor, and tributaries) by tunneling below or spanning over the systems. FRA has considered Environmental Site Design (ESD) in planning and placement of piers to avoid and minimize impacts to wetlands and waterways to the extent possible*” (4.12-23).

## 2. SOCIOECONOMIC BENEFITS OF HIGH-QUALITY WATERS (IF APPLICABLE)

### 2.1 SOCIAL IMPORTANTS AND BENEFITS OF MAINTAINING HIGH QUALITY WATER IMPACTS ON:

*2.1.1 Property Value:* The DEIS Chapter 4.6 notes that SCMAGLEV may have a positive impact on property values, and on page 5 of that chapter the DEIS predicts that SCMAGLEV will increase property values in the region by \$1.36 billion. Additionally, the DEIS notes that the SCMAGLEV anticipated property acquisitions would lessen the regional tax base by less than 0.2% which is less than one year’s average annual rate of growth (DEIS 4.7-6/7). This means that local jurisdictions’ tax bases will not be negatively impacted by SCMAGLEV.

*Recreation Value:* SCMAGLEV impacts on recreational facilities and parklands are detailed in DEIS Chapter 4.7. As DEIS 4.7-8 notes, Alignment J1, not J (BWRR’s preferred alignment), would impact more recreational facilities and twice as many parks. This is yet an additional reason why BWRR has selected Build Alternative J-03 as the preferred alignment and project proposal that uses Alignment J. Moreover, the proposed MD-198 TMF would impact more than three times as much parkland as the BARC West TMF (DEIS 4.7-8), another reason why BWRR favors BARC West TMF. See below Table 4.7-3.

Affected Environment, Environmental Consequences and Mitigation

**Table 4.7-3: Summary of Permanent (P) and Temporary (T) Property Impacts to Recreational Facilities and Parklands by Build Alternative (in Acres)**

Recreational Facility/Park	Impact	Build Alternative											
		J-01	J-02	J-03	J-04	J-05	J-06	J1-01	J1-02	J1-03	J1-04	J1-05	J1-06
Small Park Reservations	P	0	0	0	0	0	0	0	0	0	0	0	0
	T	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NYARC	P	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	T	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Greenbelt Forest Preserve	P	0	0	0	0	0	0	39.7	40.5	41.0	39.7	40.5	42.0
	T	0	0	0	0	0	0	5.8	7.6	5.8	5.8	7.6	5.8
BWP	P	88.9	68.8	67.4	88.9	68.8	67.4	52.7	39.6	41.4	52.7	39.6	41.4
	T	27.6	36.6	36.0	27.6	36.6	36.0	13.6	14.8	14.1	13.6	14.8	14.1
Springfield Road Park	P	0	0	0	0	0	0	0.8	1.7	1.7	0.8	1.7	1.7
	T	0	0	0	0	0	0	0	0.7	0.7	0	0.7	0.7
Patuxent River Park	P	<0.1	0	0	<0.1	0	0	1.8	1.4	1.4	1.8	1.4	1.4
	T	<0.1	0	0	<0.1	0	0	0.6	0.8	0.8	0.6	0.8	0.8
Brockbridge Park	P	0	0	0	0	0	0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	T	0	0	0	0	0	0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Maryland City Park	P	0	0	0	0	0	0	24.4	18.3	18.3	24.4	18.3	18.3
	T	0	0	0	0	0	0	3.8	4.3	4.3	3.8	4.3	4.3
PRR	P	23.8	23.53	23.5	23.8	23.53	23.5	0	0	0	0	0	0
	T	25.9	25.5	25.5	25.9	25.5	25.5	0	0	0	0	0	0
Montpelier Hills Park	P	0	0	0	0	0	0	0.6	0.6	0.6	0.6	0.6	0.6
	T	0	0	0	0	0	0	0.3	0.3	0.3	0.3	0.3	0.3

Source: AECOM/Straughan, August 2020

*2.1.2 Other Quality of Life Benefits:* As section 1.2 already noted, there will be significant economic and environmental benefits associated with the SCMAGLEV project including apprenticeship and job opportunities for traditionally overlooked communities and steep reductions in



regional automobile congestion and emissions. The DEIS also notes in Chapter 4.5 and 4.6 that SCMAGLEV will specifically help many of the EJ Communities reap the rewards this project has to offer.

## 2.2 GENERAL EVALUATION OF ECONOMIC IMPACTS OF WATERS OF GOOD QUALITY:

2.2.1 Impacts to resources necessary to maintain high quality waters: DEIS Chapters 4.10 and 4.11 address water quality resources and wetland impacts.

2.2.2 Costs of 1:1 in-kind mitigation for all net forest cover loss based on area market value: The unit cost of mitigation for forest cover loss based on market value is approximately \$35,000/acre. The estimated cost to mitigate loss of permanent forest cover within the Beaverdam Creek 2 and Patuxent River 1 Catchment watersheds, based on approximate impacts of 311 acres is \$10,885,000.

2.2.3 Estimated cost of stream restoration, per linear foot, based on area market value: The unit cost for stream restoration ranges from \$1,500-\$2,300/ linear foot. The estimated cost of necessary stream restoration in the Beaverdam Creek 2 and Patuxent River 1 catchments, based on permanent impacts to 7,041 linear feet (lf) of streams within these watersheds is \$10,561,500-\$16,194,300.



### 3. CONCLUSION

As this document has made clear, although there will be impacts to Tier II Catchment watersheds because of SCMAGLEV, these impacts have been balanced with the significant environmental and economic benefits that will be generated by the SCMAGLEV project. From less automobile congestion and emissions to newfound job opportunities and training, SCMAGLEV will deliver enormous benefits to traditionally overlooked EJ populations.