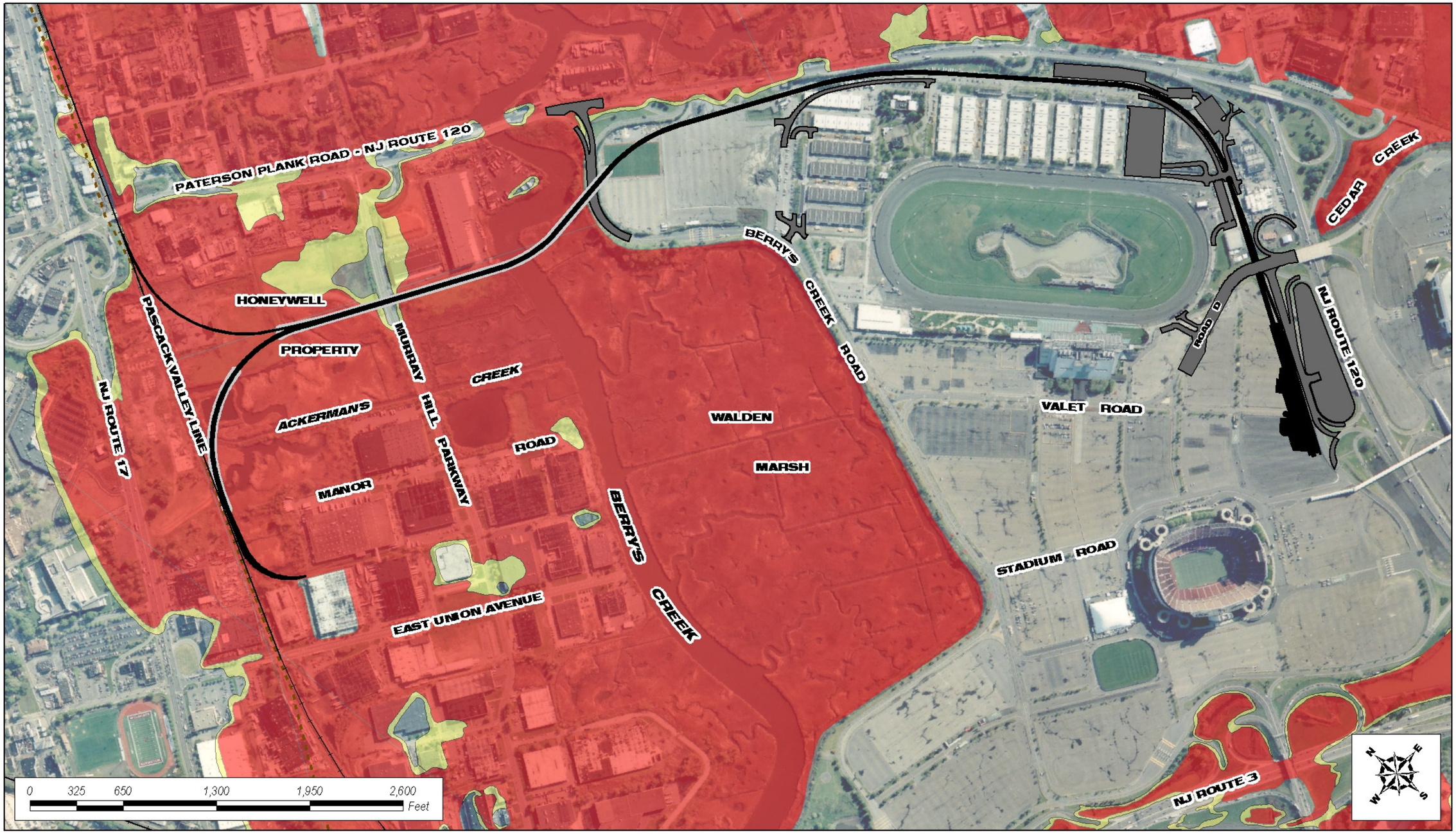
4.4 Floodplains

4.4.1 Existing Conditions

A large portion of the HMD is located in the 100-year floodplain as mapped by the Federal Emergency Management Agency (FEMA). A floodplain is defined as any land area susceptible to being inundated by floodwaters from any source (44 CFR 59), whereas the 100-year floodplain is the area of land inundated by a flood event that has a one percent chance of being equaled or exceeded in any given year. The 100-year flood event is typically used as a benchmark in engineering design for projects located in a floodplain. In the HMD, the source of flooding can be either due to extreme precipitation or abnormally high tidal water levels caused by storm surges. Many of the developed areas existing today in the HMD are located in floodplains and are vulnerable to extreme tidal flooding events *(USEPA and USACOE, 1995).*

The major hydrologic feature in the HMD is the Hackensack River. The major sources that contribute to regional flooding include tidal flows that enter the Hackensack River from Newark Bay and, to a minor degree, fluvial (freshwater) flows from areas within the Hackensack River watershed. These freshwater flows consist primarily of stormwater runoff from landscape within the watershed, but also include limited groundwater flows. Given the intensity of development within the HMD, however, the groundwater component of these freshwater flows is less significant due to the higher impervious land coverage and resulting lower groundwater infiltration found within the watershed. Previous hydrodynamic modeling conducted as part of the Special Area Management Plan (SAMP) Draft Environmental Impact Statement for the area indicated that the greatest flows to the lower Hackensack River in the vicinity of the Meadowlands Railroad and Roadway Improvement Project are attributed to tidal flows from Newark Bay *(USEPA and USACOE, 1995).* The Bergen County Flood Insurance Study published in 1993 states that floodwater elevations within the project would range between 8.2 and 8.4 feet NGVD.

The Meadowlands rail alignment would traverse approximately one mile of the 100-year floodplain (Zone AE) to the west of the Meadowlands Sports Complex. The remainder of the alignment is located within the Sports Complex, outside of the FEMA-mapped 100-year floodplain (Zone X). Figure 4.4-1 displays both the 100-year and 500-year floodplains according to the FEMA Q3Flood Data mapping.



Source: FEMA Q3Flood Data 1996
Photo Date: May 2004

Edwards and Kelcey

LEGEND

- Proposed Railroad and Station (viaduct along grey border)
- Proposed Roadway Improvements
- Existing Railroad
- NJMC Boundary

FLOODPLAINS

- 100-Year Floodplain
- 500-Year Floodplain

NJSEA

NJ TRANSIT

MEADOWLANDS RAILROAD AND ROADWAY IMPROVEMENT PROJECT ENVIRONMENTAL IMPACT STATEMENT

FIGURE 4.4-1
FLOODPLAINS
April 2005

During the construction of the entire Meadowlands Sports Complex, parking areas and perimeter roads were elevated and a dike was constructed to approximately 10 feet NGVD in order to prevent the 100-year tidal flood event from entering the site *(USACOE,* 1975). The original design of the Meadowlands Sports Complex included the construction of a dike along its western perimeter between Walden Marsh and Berry's Creek Road. The dike includes a slurry trench cutoff wall in the core of the embankment between approximately elevation +10 and -9.0 feet NGVD, (*NJSEA, 2004*). It extends from NJ Route 120/Paterson Plank Road south to NJ Route 3. The remainder of the Sports Complex is protected from flooding by the various highways and roadways surrounding the site that are elevated above 8.4 feet NGVD, the anticipated height of the 100-year flood. The majority of the proposed roadway improvements are located outside 100-year floodplain with the exception of the proposed improvements at the intersection of NJ Route 120/Paterson Plank Road and Berry's Creek Road.

4.4.2 No-Action Alternative

It is anticipated that floodplain conditions under the No-Action Alternative will be similar to existing conditions.

4.4.3 Preferred Alternative Impacts

Overall, the proposed Meadowlands Railroad and Roadway Improvement Project is expected to have a negligible impact on flooding conditions within the greater Hackensack River floodplain. The Project calls for a small amount of fill to be placed in the floodplain along the alignment at its connection with the NJ TRANSIT Pascack Valley Line and along the relocated General Foam siding. Beyond this connection the rail alignment would be elevated above the floodplain supported on a concrete viaduct and steel pilings, not fill. It would continue above the floodplain over Murray Hill Parkway, Walden Marsh, Berry's Creek and Berry's Creek Road and into the Sports Complex. The remainder of the alignment within the Sports Complex would be protected from the 100-year floodway. Reductions in flood storage volume resulting from the nominal amount of fill and placement of the pilings supporting the viaduct are insignificant in comparison to the magnitude and extent of the 100-year tidal flood associated with Berry's Creek and the Hackensack River.

The majority of roadway improvements would take place within the confines of Meadowlands Sports Complex, thus outside of the 100-year floodplain. The intersection of NJ Route 120/Paterson Plank Road and Berry's Creek Road, however, is partially located in the 100-year floodplain. These proposed improvements would not impact the floodplain, as they would not involve additional landfilling.

Because the Project would be located in a floodplain that is tidally influenced, the New Jersey Department of Environmental Protection (NJDEP) stream encroachment 20 percent net fill rule would not apply. Berry's Creek, however, is not listed as a "non-regulated tidal water way" by the NJDEP and would be subject to the Land Use Regulation rules for work within the

floodway/channel area. Bridge hydraulics and scour protection would also be addressed as part of the regulatory requirements.

At its connection with the NJ TRANSIT Pascack Valley Line the proposed alignment would cross over existing twin 27 x 42 inch elliptical reinforced concrete pipe culverts. The pipe culverts convey runoff from a small tributary to Walden Marsh and ultimately to Berry's Creek. The drainage area to the culvert is approximately 65 acres. Appropriate hydrologic and hydraulic evaluations would be required for any extension/modification of the culverts.

The proposed Meadowlands rail station is the only publicly accessible building to be constructed as part of the project. It would be situated well inside the Sports Complex and outside of the 100-year floodplain. No impacts are anticipated as a result of construction of the proposed rail station.

4.4.4 Mitigation

Mitigation for impacts to floodplains can be performed in a variety of ways depending upon the work being performed. The proposed bridge spanning Berry's Creek will be designed to avoid significantly increasing the upstream water surface elevation. A significant increase in water surface elevation is defined as being greater than 0.2 feet according to NJDEP Land Use Regulation rules. Currently, the NJDEP does not have an approved/adopted model (HEC-2 or HEC-RAS) of Berry's Creek. Therefore a new hydrologic and hydraulic analysis will be prepared to document the impacts of the Project, if any, to Berry's Creek.

In regard to the twin 27 x 42 inch culverts at the tie in on the Pascack Valley Line, NJDEP Land Use Regulations will require hydrologic and hydraulic evaluations and possible mitigation for any extension or modification of the culverts because the drainage area to the culverts exceeds 50 acres.

In addition, the Project's stormwater management system will be designed to provide adequate collection and conveyance of site stormwater runoff for localized fluvial storm events in a manner that prevents flooding.