NOVER-ARMSTRONG ASSOCIATES, INC.
124 Main Street, Unit 2GG
Carver, Massachusetts 02330
Telephone 508.866.8383
Facsimile 508.866.9898

SDO-certified DBE & WBE
www.noverarmstrong.com

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Douglas W. Heim, Esq.
Arlington Town Counsel
50 Pleasant Street
Arlington, MA 02476

Re: **Notice of Eligibility for 40B Site Eligibility Letter**
**"Thorndike Place" off Dorothy Road**
**(Mugar Site) Arlington, MA**
NAA File No. P3778

Attorney Heim:

Nover-Armstrong Associates, Inc. (Nover-Armstrong) has completed a review of the May 2015 Chapter 40B Project Eligibility / Site Approval, the first step in the Comprehensive 40B Site Approval Application process for the "Thorndike Place" Housing Project located off Dorothy Road in Arlington, MA submitted to Massachusetts Housing Finance Agency ("MassHousing") by SEB, LLC. The purpose of Nover-Armstrong's review was to provide the Town of Arlington with comments and recommendations for consideration in their response to MassHousing regarding whether the proposed project design is generally appropriate for the Site. The appropriateness of the Site was evaluated by examination of the information submitted with the Application and other readily available public information. Our review of this Application recognizes that it is very conceptual in nature and that more detailed plans would be developed and submitted to the Arlington Zoning Board of Appeals during the Comprehensive Permit Site Approval process if the project receives Project Eligibility / Site Approval from MassHousing. A main focus of our review was the potential project impacts on the Site, adjoining properties and existing infrastructure during flooding events. Based on our review of the information, Nover-Armstrong feels SEB, LLC has not demonstrated that the Site can accommodate the project without having detrimental impacts to wetland resources and existing flooding conditions on the Site and surrounding neighborhood.

Information reviewed includes:

- *Comprehensive Permit Site Approval Application,* prepared by Arlington Land Realty, LLC; including:
  - *Existing Conditions Plan and Preliminary Site Plan*, 2 Sheets each, 1 B&W copy and 1 Color copy, prepared by Borrego Solar, not stamped or endorsed, dated 02/24/2015;
  - *Preliminary Architectural Plans*, 7 Sheets, prepared by Oaktree Development LLC, not stamped or endorsed, dated 12/15/2014 and 03/16/2015;
  - "*By-Right Plans*", 2 Sheets, prepared by Tetra Tech Rizzo, not stamped or endorsed, dated 06/17/2009.

**Site Description**
The project Site is located on a number of parcels totaling approximately 17 acres and collectively known as the "Mugar Site". The triangular shape Site is generally forested land abutting residential neighborhoods to the north, Thorndike Park to the east, and Route 2 to the south and west and generally slopes from the neighborhoods down towards Route 2. The long dormant Site has been altered by excavations and dumping of fill over the years. Our inspection found old stockpiles of earthen material, solid waste and in the northwest area of the Site and other debris throughout. Invasive species make up a significant composition of the vegetative habitat throughout areas on the Site.

The Site contains several resource areas Subject to Protection under the Massachusetts Wetlands Protection Act, M.G.L. Chapter 131, Section 40 and the Town of Arlington Wetlands Protection Bylaw, Article 8 including Land Subject to Flooding, isolated and bordering Vegetated Wetlands, Land Under Water, and Bank. Nover-Armstrong noted forested and non-forested Vegetated Wetlands throughout the site, some of which with physical characteristics of potential vernal pool habitat. The resource area boundaries are not flagged in the field and are not legally confirmed by the Arlington Conservation Commission at this time.

**Site Watershed and Flooding**
The Site is located within the Alewife Brook Watershed that lies within the larger Mystic River Watershed. Stormwater runoff from the Site collects in the onsite wetland resource areas located along Route 2. Three pipe outlets convey overflow from the wetlands under Route 2 and are surmised to connect to the Alewife Brook Reservation's stormwater management system. During times when the Alewife Brook overflows, these pipes serve as equalizer pipes allowing floodwaters to backflow onto the Site. Examination of the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) shows that floodwaters rise to a height that essentially inundates most of project site during the 100-year flood (Zone AE) and completely floods the entire Site during the 500-year flood (Zone X). FEMA describes Zone X at this location to be either areas of the 500-year flood or areas of the 100-year flood with average depths of less than one (1) foot or with drainage areas less than one (1) square mile. Historical reports indicate that flooding occurs beyond the 100-year flood extents shown on the FIRM.

**Site Topography**
Numerous small to medium size depressions were found in the northern portion of the Site with a larger size depression located in the northeast area of the Site. This larger depression appears to be a major reason for chronic flooding of the adjacent neighborhood properties. The topography of the depression is such that ponded water extends into the abutting neighborhood yards before it starts to overflow to the south towards Route 2. Ponded water in another low area bordering the northwest corner of Thorndike Park may also spill over into abutting properties. This area is isolated from a drainage channel that runs along the property line common to Thorndike and ultimately connecting to the eastern drainage outlet pipe that runs under Route 2.

During our site inspection on 08/03/2015, Nover-Armstrong noted two potential outlets from the B-Series Isolated Vegetated Wetlands (as shown on the existing conditions plans) that may be an annual hydraulic connection to Bordering Vegetated Wetlands.

**Findings and Recommendations**

Based on our review of the information submitted with the Application and inspection of the Site, Nover-Armstrong offers the following findings and recommendations for consideration by the Town of Arlington:

1. The Application does not comply with the Required Attachments Relating to Section 2.0 Existing Conditions Plan.
    a. The plans submitted with the Application are not signed and stamped by a registered engineer or surveyor as required by Section 2.1 of the eligibility Application. The vertical datum is not specified for the existing ground elevations and the 100-year flood elevation. The narrative provide in the Application states that all elevations are based on the National Geodetic Vertical Datum of 1929 (NGVD 29).
    b. The Existing Conditions Plan do not provide surveyed property boundaries as required.

2. The Application does not comply with the Required Attachments Relating to Section 3.0 Preliminary Site Layout Plan(s).
    a. Proposed site grading (2' contours) are not shown.
    b. Proposed utilities (stormwater Best Management Practices and conveyances) are not shown.

3. The plans submitted with the Application are difficult to read and are lacking sufficient detail to be able to assess whether the proposed project is generally appropriate for the site. The submitted preliminary *Overall Site Plan C-2.0* does not show the proposed site grading (2' contours) as required by Section 3.1 of the Application. Without the proposed grading shown, we are unable to provide an assessment of the Project's impact on the existing flooding conditions on the Site, adjoining properties and public infrastructure.

4. The Project site is proposed in an area of well documented significant flooding problems. The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) essentially shows the entire project site within areas of flooding by the 100-year flood (Zone AE) or within areas of flooding described as either the 500-year flood or the 100-year flood with average depths of less than one (1) foot (Zone X). Historical records indicate that flooding occurs beyond the extents shown on the FIRM.

5. The boundary of Bordering Land subject to Flooding (BLSF) is defined in the Wetland Regulations at 310 CMR 10.57(2)(a)3 as the estimated maximum lateral extent of the 100-year frequency storm. If available, the FEMA 100-year flood elevation shall be presumed accurate.

6. The *Existing Conditions Plan C-1.0* illustrates Bordering Land Subject to Flooding (BLSF) with a bold dashed line at an elevation of 7.81 as defined by the Applicant's topographic survey. Again, this elevation is assumed to be based on NGVD 29 and appears to be taken from the previous issue of the flood maps. The current effective regulatory flood elevation on the Site is 6.8 NAVD 88 (North America Vertical Datum of 1988) as found in the 2010 Middlesex County Flood Insurance Study. Elevation 6.8 NAVD 88 translate to an elevation of 7.61 NGVD 29 which is slightly lower than the BLSF shown on the *Existing Conditions Plan C-1.0.*

7. The Arlington's Conservation Commission's jurisdiction is not subsumed within the 40B Comprehensive Permit process. It is recommended that due to the historical evidence of the Alewife Brook (Little River) flooding impacting the Site and adjacent neighborhoods, the Commission request the Arlington ZBA deny all waivers requested by the applicant relating to the Arlington Wetlands Protection Bylaw. Waiver of the Wetlands Bylaw would prevent the Commission from taking into account evidence of flooding of residences located beyond the Zone AE limits shown on FEMA's maps.

8. It appears that significant clean fill will be required to be placed on the project site to elevate portions of the project above the 100-year floodplain or to provide suitable base material for the building foundations, access roadways, parking areas and to be able to provide free discharge of stormwater from the developed Site.

9. The Preliminary Site Plans do not show the construction-phase details that should be evaluated as part of this Application process to determine whether the conceptual project design is generally appropriate for the Site including identified construction laydown area, necessary fill stockpile areas, construction worker parking, and construction / delivery trucks and equipment traffic circulation plan.

10. The Preliminary Site Plans conceptually depict Site access and egress from Route 2. Although the Application does not appear to include the Lake Street Off Ramp Driveway Access, it should be noted that if this access ramp were to be included in the future, it would be partially located through existing wetland resource areas and FEMA Floodway. Permitting feasibility should be evaluated if this design option is being considered or required as mitigation.

11. Based on accounts of flooding in the adjacent neighborhoods, it is recommended that the Project not be allowed to drain to the adjacent street drainage systems. Flooding of the adjacent neighborhood streets may be a result of limited inlet and trunk line-capacity as well as submerged trunk line outfalls during larger storm events. The FEMA flood profile data indicates that the outfall of the drainage system at the west end of Dorothy Road is below the 10-year flood elevation.

12. The impervious surface from the Project will increase the rate and volume of stormwater runoff. In our opinion, it does not appear to be realistic for the project design to provide a free discharge of the stormwater management systems to control the peak rate of runoff or to be able to provide sufficient recharge of the groundwater to effectively reduce the volume of runoff.

13. Any increase in the volume of stormwater runoff from the Project Site could exacerbate the flooding on the Site and adjacent streets. While the Project could provide some relief of existing neighborhood flooding during the smaller storm events as claimed in the Application, the development can be expected to exacerbate flooding during the 100-year and other large storm events. The only way the Project could completely ensure that there would be no increase in existing neighborhood flooding is to provide compensatory flood storage for all fill placed on the Site regardless of whether the existing ground elevation is above the FEMA 100-year flood elevation or not.

14. As previously stated, Required Attachments Relating to Section 3 of the Application requires that proposed utilities be shown. The conceptual Preliminary Site Plans submitted with the Application do not show the proposed utilities including the stormwater management Best Management Practices (BMPs) required to comply with the Massachusetts Stormwater Regulations.[1] Without a conceptual level of stormwater BMP detail, it cannot be definitely determined whether the conceptual project design is generally appropriate for the Site.

15. Eight boring locations are shown on the *Existing Conditions Plan C-1* with surface elevations and depths to groundwater noted. Dated and detailed boring logs are not provided on the plans or in the Application making it difficult to evaluate whether the depth of the groundwater observed represents the seasonal high groundwater elevation. The depth to groundwater is presumed to have been measured the day the borings were advanced and may not represent the actual high ground water elevation.

16. Excavated test holes witnessed by a Massachusetts Soil Evaluator are necessary to definitively identify the Site's soil types and whether the conceptual project design is generally appropriate for the Site. Boring logs document encountered type soils on the Project Site which help evaluate what types of BMPs would be feasible for the stormwater mangement system.

17. The available soil information from the USDA describes the soil in the area of the development to be Udorthents, Wet Substratum, Map Unit 655. The Application notes that loose sandy and gravelly glaciofluvial deposits exist on the Site. The USDA notes that Udorthents, Wet Substratum could also be a loamy till that would have much lower infiltration capacity. Udorthents are described as areas from which soil has been excavated and areas where soil material has been deposited for development projects.

18. It is recommended that any plans submitted with a Notice of Intent to the Arlington ZBA and Conservation Commission be of sufficient quality and level of detail to allow for review of the final layout and grading of the project including the stormwater management system BMPs, mitigation measures including floodplain compensation, limit of fill / work with respect to the resource area boundaries, landscaping, and erosion and sedimentation control.

In order for the Town of Arlington to fully evaluate whether the project design is generally appropriate for the Site, the Applicant should at a minimum, meet the submittal requirements with respect to the Existing Conditions and Preliminary Site Plans including providing the conceptual stormwater management design BMPs. Without depicting the realistic conceptual impact on the Site from full development, we feel the Town of Arlington does not have sufficient information for this Application process.

[1] Massachusetts Wetland Regulations, 310 CMR 10.05(6)(k)

Based on the conceptual information and current understanding of the Site and environs, Nover-Armstrong questions the ability of this Site to accommodate the proposed project.

Sincerely,
**Nover-Armstrong Associates, Inc.**

Henry T. Nover, P.E.

Marta J. Nover
Principal