

Appendix A: Technical Instructions

Guidelines for Calculating General Land Area Minimum

January 17, 2018

Introduction

This document provides step-by-step instructions for preparing a General Minimum Land Area submittal. This document is intended to accompany the *Guidelines for Calculating General Land Area Minimum*, which provides municipal boards of appeal with information on the regulations for General Land Area Minimum, key definitions, and an overview of the submittal requirements and steps entailed in the calculation. Appendix B includes an example calculation based on a fictionalized municipality. These instructions are designed to be implemented by a Technical Analyst trained in Geographic Information Systems (GIS).

Data Specifications and Detailed Submittal Requirements

DHCD requires all submittals to be delivered in specified electronic formats that will enable reviewers to validate the results. The Board must submit spatial data delineating the Total Land Area, Excluded Areas, and the SHI Eligible Area, and the individual components thereof. The Board must also prepare a spreadsheet with details on each parcel containing SHI Eligible Housing units (termed SHI Sites), including information about the number of eligible units and acreage of eligible area. This data, along with maps and calculations, must be provided to the Applicant and DHCD within fifteen (15) days of the Board opening a hearing regarding the Comprehensive Permit filed by the Applicant.

The technical instructions and specifications of these guidelines reference Esri ArcGIS mapping software and file formats. Spatial data shall be delivered as an Esri map package or other Esri compatible format.¹ Spatial data shall be stored within a file geodatabase with separate feature classes for each component of the calculation.

Each submittal must include the following elements:

Data Sources

General Land Area Minimum submittals must utilize parcel (land lot) and assessor data consistent with the MassGIS Level 3 Digital Parcel Standard.² This standard establishes how parcel boundaries are compiled, and stipulates that a very high percentage of parcels must be joined to an assessor tax record and vice versa. The standard also requires the data to be stored in a specific way: an Esri file geodatabase with three feature classes, a database table, and two look-up tables.

MassGIS completed the production of Level 3 Digital Parcel Standard-compliant Assessors' Parcel maps for every city and town in 2013 and encourages municipalities to maintain their data in compliance with the Level 3 Digital Parcel Standard. Maintaining Level 3 compliant data is no more expensive than maintaining other forms of parcel mapping. The Massachusetts Association of Assessing Officers, Inc. (MAAO) endorses MassGIS's standardized parcel mapping as a best practice, and following this standard is consistent with the Department of Revenue's current assessor recertification guidelines.³

If the municipality is maintaining parcel data consistent with the Level 3 Digital Parcel Standard, the current fiscal year's parcels and assessors' records can be used. If current Level 3 Digital Parcel Standard Assessors' Parcels are not available from the assessor (including the presence of a LOC_ID in the CAMA⁴ record) then the analysis

¹ To create a map package, choose File > Create Map Package from the ArcMap Standard toolbar.

<http://www.esri.com/news/arcuser/0911/share-and-document-maps-with-map-packages.html>

² <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/l3parcels.html>

³ <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/municipal-gis/assessors-and-gis/why-maintain-standardized-mapping.html>

⁴ Computer-Assisted Mass Appraisal, or CAMA, "is an automated system for maintaining property data, valuing property, notifying owners, and ensuring tax equity through uniform valuations." (<http://www.mass.gov/dor/docs/dls/it/pdfs/cama1.pdf>)

must rely on the most current Level 3-compliant parcels available locally or from MassGIS.⁵ If a municipality believes that digital parcel boundaries and/or resulting calculated area are incorrect, it may use surveyed⁶ boundaries to update the digital parcels, so long as it also provides the same for all adjacent parcels.⁷ Submittals that do not include documentation evidencing that the updated digital parcel data is compliant with the Level 3 standard as determined through MassGIS' quality assurance program and that the surveyed boundaries were surveyor stamped within the last year will be considered incomplete.⁸

The calculation will require use of the TaxPar Feature Class, L3_TaxPar_Poly. Additionally, the tabular assessor data extract (L3_Assess) will be needed to match subsidized housing developments to the corresponding parcel and to identify publicly-owned land based on the Property Type Classification Code or USE_CODE. The assessors' table should be joined to the parcel polygons. Note that for some parcels, the L3_Assess table may contain multiple records for the same parcel and LOC_ID. These include condominiums where multiple owners exist on the same parcel. ArcGIS will only join a single record will join to the parcel. If none of the municipality's SHI Sites, publicly-owned properties, or public rights-of-way have this issue, it will not affect the General Land Area Minimum calculation. Analysts should cross check the L3_Assess table with the LOC_IDs that successfully joined to resolve the many-to-one issue if necessary.

The calculation will also use other datalayers available through MassGIS, such as:

- Community Boundaries (Towns) from Survey Points, TOWNSURVEY_POLY layer
- MassDEP Hydrography (1:25,000) datalayer and the HYDRO25K_POLY feature class

If the Board wishes to include or exclude areas where residential, commercial, or industrial use is prohibited in accordance with 760 CMR 56.03(3)(b) or that are Previously Registered Inland Wetlands because such areas are not available as spatial data provided by MassGIS, this information must be provided as spatial data in an Esri-compatible format and supported with thorough documentation.

Spatial Data Submission Requirements

The submission must include the following spatial data files. All spatial data will be saved as feature classes in a file geodatabase. The map package, which includes the file geodatabase, shall all be saved in a single folder and then exported as a "Zip" folder.

Each submittal must include the following feature classes:

- GLAM_[MunicipalityName]_SHI_Sites
- GLAM_[MunicipalityName]_Parcels
- GLAM_[MunicipalityName]_Water
- GLAM_[MunicipalityName]_Public_Land
- GLAM_[MunicipalityName]_ROW
- GLAM_[MunicipalityName]_Exclusions
- GLAM_[MunicipalityName]_Total_Land_Area

Some submittals will also include these feature classes:

- GLAM_[MunicipalityName]_RegWetlands
- GLAM_[MunicipalityName]_Zoning

Tabular Data Submittal Requirements

Supporting data must be provided in tabular format, with a separate record corresponding to each parcel or polygon in the spatial data, with a common ID field. Data can be submitted as Microsoft Excel (*.xls or *.xlsx)

⁵ <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/download-level3-parcels.html>

⁶ Survey meeting the minimum standard detail requirements for ALTA/ACSM land survey titles (see <http://www.malsce.org/malsce/file/20110223ALTAACSMLandTitleSurveyStandard2011.pdf>).

⁷ Municipalities are strongly encouraged to submit updated Level 3 parcel data to MassGIS at the earliest opportunity.

⁸ Surveys must have been created or updated within the last year as evidenced by a surveyor stamp with date and signature.

files or in another widely available table format (.csv, etc.) The instructions below specify the required columns that should be included in each table; any additional columns must be clearly defined. At a minimum, the following tables are required:

- GLAM_[MunicipalityName]_SHI_Sites.xlsx
- GLAM_[MunicipalityName]_Public_Land.xlsx
- GLAM_[MunicipalityName]_ROW.xlsx
- GLAM_[MunicipalityName]_Zoning.xlsx

Submittals from municipalities with Previously Registered Inland Wetlands may also include

- GLAM_[MunicipalityName]_RegWetlands.xlsx

Map images

The Board should provide maps depicting each of the spatial components described above as letter-size (8.5" x 11") Adobe Acrobat PDF files. If Adobe Acrobat software is unavailable, maps may be exported as image files (*.png or *.jpg). Regardless of the format, maps must be produced with a resolution of at least 400 dpi when printed on letter-size paper.

There must be a map showing the results of each step of the Total Land Area calculation, a map of the final results, and maps with aerial imagery showing each SHI Site and a delineation of the Eligible Area. In cases where SHI developments are adjacent to each other it is okay to depict them in a single map, provided that individual parcels and edited SHI Site boundaries are clearly visible. For very large developments it may be necessary to make multiple maps.

Each map should include a title, labels to help orient the viewer and highlight important details, a north arrow, a scale bar set to a usable scale, and a legend.

Acreage calculations

The Board must document each step of the acreage calculation, in a format specified in the methodology below. The Board must be able to demonstrate with map images, spatial data, and tabular data, that: 1) any land area included in the numerator (SHI-Eligible Area) is also included in the denominator (Total Land Area), and any land area that is excluded from the denominator is excluded from the numerator; 2) no Excluded Area is counted more than once; 3) land area is properly prorated for SHI Sites where all units on the site are not SHI Eligible Housing units (but not the maps since this cannot be depicted geographically); 4) only the land area Directly Associated with the development is included in the numerator; and 5) the Group Homes acreage is included in the numerator calculation, if applicable.

The SHI-Eligible Area must be completely contained within the Total Land Area and must exclude ineligible portions of parcels with subsidized housing. The area of each component (as calculated in GIS) must match the acreage calculations used in the submittal. The union of the Total Land Area and all the exclusions must be exhaustive of the municipal land area based on digital parcels. The SHI-Eligible Area must be represented as separate polygons contained within digital parcel boundaries, and each record must have a LOC_ID linking it to the underlying parcel and corresponding SHI Site table.

Supporting documentation

The Board must supply digital copies of the relevant sections of local regulations, such as zoning bylaws and zoning maps. Previously Registered Wetlands restrictive orders, as recorded at the County Registry of Deeds, and Publicly Restricted Open Space recorded use restrictions and zoning approvals (for purposes of inclusion of Open Space Residential Development as Directly Associated Area) must also be included. If the analysis used locally-derived or third-party (non-MassGIS) data for determining the boundaries of zoning and Previously Registered Inland Wetlands, the source data must be provided in an Esri-compatible format along with metadata and, where necessary, documentation. Photographs of development sites may be needed to document land that is Directly Associated, in cases where the aerial photograph may not be sufficient to demonstrate inclusion of these areas in the SHI Site acreage.

Step 1: Identify SHI Sites

A complete and standardized list of parcels containing SHI Eligible Housing units is the essential first step in the General Land Area Minimum calculation. Each development on the SHI Detail List (and any other recently approved development) must be matched to a specific parcel or parcels, and the units allocated across parcels.

1.1. Create a list of SHI Sites.

DHCD will provide the most current SHI Detail List for the municipality within 15 days of receiving notification that the Board intends to prepare a General Land Area Minimum submittal. The municipality may also begin with its own list of SHI Eligible Housing. The Board should review the SHI Detail List to confirm that it is a complete list of all developments or units that meet SHI Eligible Housing criteria which are occupied, available for occupancy, or under permit as of the date of the Applicant's initial submission to the Board. The Board shall provide documentation for any known SHI Eligible Housing units not already listed on the SHI Detail List, to evidence that such units satisfy SHI Eligible Housing criteria in accordance with DHCD regulations and guidelines.

The SHI Detail List is provided as both a PDF and a Microsoft Excel spreadsheet. The PDF lists each municipality in alphabetical order and details regarding each city or town's Subsidized Housing Inventory is organized by DHCD ID number. The column headings in the PDF are: DHCD ID#, Project Name, Address, Type, Total SHI Units, Affordability Expires, Built w/ Comp. Permit?, and Subsidizing Agency. At the end of the listing for each municipality, the total SHI Units, the Census 2010 Year Round Housing units, and the percent subsidized is listed. The Excel spreadsheet includes the same information, except that projects with more than one funding/subsidizing agency are listed with a unique row for each agency. Additionally, the total units and percent subsidized for each municipality is not included.

To prepare a list of SHI Sites for General Land Area Minimum, the Board should begin with the Excel Spreadsheet, though the PDF is a useful reference to ensure that units funded by more than one agency are not counted more than once.

- To begin, ensure that the SHI Detail List contains only developments located in the municipality, and save this spreadsheet as "**GLAM_[MunicipalityName]_SHI_sites.xlsx**".
- Review the list. Each row will have a DHCD ID. Not all developments will have a project name. The addresses may be specific street addresses, intersections, or, in the case of group homes, will be listed as confidential.
- Clean up the rows in the spreadsheet. If group homes are listed, the list of SHI Sites will need to be submitted to DHCD in order to obtain the total acreage for group homes via the Group Homes Acreage Calculation process as described below. Delete the rows containing information about DMH and DDS Group Homes since their locations are confidential. Additionally, some developments may be listed more than once because there is more than one subsidizing agency. Information regarding the subsidizing agencies is not required for the General Land Area Minimum calculation, so duplicate entries must be consolidated into a single row.
- Clean up the columns in the spreadsheet. Delete the funding agency, comprehensive permit, and year end columns as they are not relevant to the calculation. If there are additional known SHI Eligible Housing units not listed in the SHI Detail List, they should be added to the SHI Sites Submission List. For the remaining columns, rename exactly as follows:
 - City/Town → MuniName
 - ID → DHCD_ID
 - Project Name → ProjName
 - Address → Address
 - SHI Units → SHI_Units

- Own or rent? → Tenure
- Add the following columns:
 - NumParcels
 - TotUnits
 - LotUnits
 - LOC_ID
- Additional columns will be added from within ArcGIS after joining this spreadsheet to the parcel data.

1.2. Join the list of SHI Sites to digital parcels to create the SHI Sites Submission List.

Set up an ArcGIS workspace in order to load digital parcel data, create a file geodatabase, find locations of SHI Sites and identify their LOC_IDs, and join the list of SHI Sites to the parcels to create the SHI Sites Submission List.

- In ArcGIS, create a new project file called **GLAM_[MunicipalityName].mxd**. Add the municipal boundary to the GIS workspace. Use the Community Boundaries (Towns) from Survey Points layer.⁹ Select the TOWNSURVEY_POLY polygon layer and create a definition query to select the city or town for mapping purposes. Right click on the municipal boundary layer and select “Export Data”. In the dialog box, select “the feature dataset you export the data into” and then click on the “Browse” icon. Click on the “New File Geodatabase” icon and save the file geodatabase as **GLAM_[MunicipalityName]** and export the municipal boundary as **GLAM_[MunicipalityName]_Boundary**.
- Load the MassGIS Level 3 Digital Parcels L3Par layer file for the municipality. . After loading, right click on the Tax Parcels layer and select “Join” from “Joins and Relates”. Choose LOC_ID as the field to base the join on. Load the L3_Assess table by clicking on the open folder icon and selecting it from the Parcels_SDE geodatabase. Click OK to join the data. Right click on the Tax Parcels layer and select “Export Data.” Export the parcel data into the file geodatabase as **GLAM_[MunicipalityName]_Parcels**.
- Match each SHI Site to a parcel using parcel address, Google Maps, assessors’ data, and local knowledge as needed. Sometimes development project names and the streets where these projects are located may be renamed, or the project may have a generalized street address which requires reviewing the assessors’ data for each parcel in that area to identify the correct parcel(s). Update the list with development names and proper street address where possible. When the parcel corresponding to each development has been identified, copy and paste the LOC_ID (unique parcel identifier) from the parcel attribute data in ArcGIS into the spreadsheet under the LOC_ID column.
- Scattered site developments and developments on multiple adjacent parcels must be disaggregated so that the constituent parts of each development are matched to a single parcel and represented by a single row in the **GLAM_[MunicipalityName]_SHI_Sites.xlsx** spreadsheet. For each development, count the number of parcels and enter that number in the appropriate cell under the column “NumParcels” in the spreadsheet. Also enter the total number of units in the SHI development in the “TotUnits” column. Determining the total number of units in the development may require review of assessors’ records and other documentation. Create multiple rows for multi-parcel developments in the list of SHI Sites to correspond with the number of parcels in each development.
- In the “LotUnits” column, enter the number of units for each parcel. If the exact distribution of units (total or affordable) across multiple parcels is unknown, units can be allocated *pro-rata* based on the

⁹ <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/townsurvey.html>

share of the SHI-Eligible Area. If this information is not available, wait to add the “LotUnits” column at a later time when the eligible area has been determined to avoid errors in GIS.

- For homeownership subdivisions, only include the parcels with SHI Eligible Housing units.
- In ArcGIS, join GLAM_[MunicipalityName]_SHI_Sites.xlsx to the digital parcels based on the LOC_ID field. Validate the join and compare the number of records that were successfully joined with the number of parcels listed in the spreadsheet. If not all records successfully joined, investigate the spreadsheet for potential errors, make the necessary corrections, and try to join the files again. Some records may have more than one listing due to the “many-to-one” issue associated with condominiums or other parcels that have multiple owners. Keep only those parcel records that were successfully joined. Select the SHI Sites in the **GLAM_MunicipalityName_Parcels** attribute table and then right click on the layer to export data. Export the selected features and save in the file geodatabase as **GLAM_[MunicipalityName]_SHI_Sites**.

1.3. Provide the SHI Sites Submission List to DHCD for the Group Homes Acreage Calculation.

To ensure compliance with privacy laws while also ensuring that municipalities have accurate data necessary to determine the General Land Area Minimum, DHCD has developed a proposed method for calculating the acreage that Group Homes occupy in a given municipality with the Department of Mental Health (DMH), the Department of Developmental Disabilities (DDS), and the Office of Geographic Information within the Massachusetts Executive Office of Technology Services and Security (hereinafter referred to as MassGIS), as further described under the Definitions section and section 1.3 of these guidelines.

To ensure adequate time for the Group Home Area Acreage Calculation to be performed prior to the Board’s invocation of the General Land Area Minimum Safe Harbor, the Board must prepare an SHI Sites Submission List (with a LOC_ID for each record) and submit the GLAM_[MunicipalityName]_SHI_Sites.xlsx file in accordance with section 1.3 of these guidelines within 21 days of learning of an application for a Project Eligibility Letter (PEL) concerning a project for which the Board anticipates invoking the Safe Harbor. A complete calculation of eligible and prorated area is not required before the list is submitted, though no additional sites can be added once the list is submitted within 7 days of the Comprehensive Permit application.

Step 2: Calculate Total Land Area

The following section outlines, step by step, how to calculate Total Land Area. 760 CMR 56.03(3)(b)(7) requires that “no excluded land area shall be counted more than once,” and as this is an iterative subtraction exercise, it is important to complete and provide the necessary documentation for each step, even if individual steps do not ultimately affect the final result.

2.1. Dissolve parcels to create municipal boundary and calculate total land parcel acreage.

Calculate the total acreage contained within the municipal boundary and create the municipal boundary “Clip Feature” by using the “Dissolve” geoprocessing tool. Use GLAM_[MunicipalityName]_Parcels as the “Input Feature” and name the Output Feature Class GLAM_[MunicipalityName] Dissolve. In the attribute table, there should now be a single feature/row. Add a new field/column in the attribute table and choose “Float” for the field type. Name the column “Acres” and run the “Calculate Geometry” function to calculate the total land parcel acreage. GLAM_[MunicipalityName]_Dissolve will be used in subsequent steps that require clipping features to the municipal boundary.

2.2. Identify water bodies.

These guidelines call for the use of MassGIS data on the location and extent of water bodies.

To identify water bodies, use MassGIS’ MassDEP Hydrography (1:25,000)¹⁰ datalayer and the HYDRO25K_POLY feature class.

Use the following definition query: POLY_CODE IN (1,6,8)

To select these codes from the POLY_CODE attribute:

- 1 – RESERVOIR (with PWSID)
- 6 – LAKE, POND, WIDE RIVER, IMPOUNDMENT
- 8 – BAY, OCEAN

Next, clip (Using the “Clip” tool in the Geoprocessing menu) the water bodies (Input Features) by the municipal boundary (Clip Features) to create a new Output Feature Class. Use the following naming convention for the new feature class: **GLAM_[MunicipalityName]_Water**. In the attribute table, add a new field/column and choose “Float” for the field type. Name the column “Acres” and run the “Calculate Geometry” function to calculate the acres for each row. Then use the “Statistics” tool to calculate the total acreage of water bodies.

Export a map called GLAM_[MunicipalityName]_Water.pdf (or if PDF is not available, as an image file per the submittal requirements) depicting the clipped water bodies along with the municipal boundary and Level 3 Digital Parcel Standard Assessors’ Parcels.

2.3. Provide locations of Previously Registered Inland Wetlands, if applicable.

Cities and towns with Restrictive Orders pursuant to the Inland Wetlands Restriction Act, M.G.L. c. 131, § 40A, shall exclude those wetlands from the Total Land Area. In order to do so, the boundaries of the restrictive order would need to be made available to DHCD for review as spatial data.

If a Previously Registered Inland Wetland is included in the General Land Area Minimum calculation, a copy of the recorded deed and any additional documentation of the location and boundaries of the wetland must be included. Additionally, the boundaries of the wetland must be digitized as a polygon feature class and must be submitted with the name **GLAM_[MunicipalityName]_RegWetlands**. Provide a map of the regulated area using the same naming convention.

¹⁰ The MassDEP Hydrography (1:25,000) datalayer is available at <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/hd.html>.

2.4. Identify areas where residential, commercial, or industrial use is prohibited.

Total Land Area may exclude all areas (both zoning districts and unzoned areas) in which any residential, commercial, or industrial use is prohibited by the municipality's zoning bylaw or ordinance.

The Board should review the local zoning bylaw use table to identify areas where all residential, commercial, and industrial use is completely prohibited. Additionally, it should identify any un-zoned areas and determine whether such uses are also prohibited in those areas. Excluded areas may be flood plains, conservation zones, or open space zones, but they can only be excluded if the prohibition of all residential, commercial, and industrial uses is explicitly stated in the zoning bylaw. Non-zoning restrictions such as conservation restrictions, easements, Chapter 61 land, or deed restrictions do not qualify as an eligible rationale for exclusion.

If any such zoning districts exist that prohibit all development, their legal boundaries shall be digitized and the file must be saved as a new feature class with the name **GLAM_[MunicipalityName]_Zoning**.

Provide a map (using the same naming convention as above, and formatted as per the submittal requirements) depicting the zoning districts where residential, commercial, or industrial use is prohibited. Submit a table listing each district and providing a reference to the applicable portion of the municipal zoning code. PDF or text files of the relevant portions of the zoning code (including maps and text specifying the legal boundaries of said district) must be provided as supplementary materials.

2.5. Combine all non-parcel-based Excluded Areas.

Use the "Union" geoprocessing tool to combine all non-parcel based exclusions into a new feature class. Include the MassDEP water bodies, Previously-Registered Inland Wetlands, and any areas where residential, commercial, or industrial use is prohibited as Input Features and save the Output Feature Class in the file geodatabase as **GLAM_[MunicipalityName]_Exclusions**. If there are more than two areas to include as input features, this step may need to be done more than once depending on the ArcGIS license available. If that is the case, first create an exclusions layer feature class with two input features, and then create a new exclusions layer based on the first exclusion layer plus an additional input feature, and repeat until all the non-parcel-based Excluded areas are combined using union.

2.6. Create the Total Land Area file to begin removing excluded areas step-by-step.

Creating a layer that accurately represents Total Land Area requires testing of definition queries, as well as a manual (visual inspection) review of attributes to ensure nothing that is supposed to be included in Total Land Area is excluded, and that nothing that is supposed to be excluded is included. As such, the process is described in a series of steps, but the result will only be a single new feature class called **GLAM_[MunicipalityName]_Total_Land_Area**.¹¹

In the GIS workspace, copy and paste a second copy of the **GLAM_Landborough_Parcels** layer. Use the "Union" geoprocessing tool to combine the exclusions layer with the parcels and name the Output Feature Class **GLAM_[MunicipalityName]_Total_Land_Area**. Join the **GLAM_[MunicipalityName]_SHI_Sites.xlsx** table to this feature class and retain all features.

2.7. Remove non-parcel-based Excluded Areas from Total Land Area.

Open the Query Builder and input the following definition query (actual query may vary depending on how files are stored and named):

```
GLAM_Landborough_Total_Land_Area.FID_GLAM_Landborough_exclusions = -1
```

This step removes any parcels or portions thereof that were unioned with the exclusion layer. What remains are parcels or portions thereof that do not intersect the exclusions.

¹¹ It should be noted that some of these operations can be implemented more efficiently by using the "Erase" geoprocessing tool in ArcMap, but since that requires an additional license, we have written the guidance so that it can be implemented using only standard ArcMap tools.

2.8. Remove publicly-owned rights-of-way owned by the United States, the Commonwealth of Massachusetts, or any Political Subdivision thereof.

Level 3 Digital Parcel Standard Assessors' Parcels include a field called POLY_TYPE, which primarily identifies fee parcels and rights-of-way. Public rights-of-way, including roads and rail rights-of-way, can be identified with a definition query for the attributes ROW and RAIL_ROW.

Add to the previous definition query in the Query Builder. Select POLY_TYPE and "Get Unique Values". Add AND NOT GLAM_Landborough_Total_Land_Area.POLY_TYPE = 'ROW' to the definition query, resulting in the following updated query:

GLAM_Landborough_Total_Land_Area.FID_GLAM_Landborough_exclusions = -1 AND NOT
GLAM_Landborough_Total_Land_Area.POLY_TYPE = 'ROW'

Since some roadway or rail rights of way may be privately owned by landowners or independent railroad companies, excluded polygons should be reviewed to ensure that all rights-of-way selected for exclusion are publicly-owned.

2.9. Remove fee parcels and other land owned by the United States, the Commonwealth of Massachusetts, or any Political Subdivision thereof.

Next, publicly-owned fee parcels will be added to the definition query. These records can be identified by their Land Use Code (USE_CODE), which is supposed to be consistent with the Massachusetts Department of Revenue Division of Local Service's Property Type Classification Codes.¹² This attribute is stored as a "String" field with up to 4 characters. The first digit indicates basic classification. Much of the land owned by the US Government, Commonwealth of Massachusetts, or any Political Subdivision thereof will be found under Code 9: Exempt Property. Subsequent digits provide additional levels of detail regarding the use classification. The following codes indicate publicly-owned properties.

Code ¹³	Classification
90x	Public Service Properties
91x	Commonwealth of Massachusetts – Reimbursable Land
92x	Commonwealth of Massachusetts – Non Reimbursable
93x	Municipal or County Codes
97x ¹⁴	Authorities
98x	Land Held by other Towns, Cities or Districts
991	Vacant, County or Regional
992	Improved, County or Regional, Deeds or Administration
993	Improved County or Regional Correctional
994	Improved County or Regional Association Commission

Publicly-owned land should be identified principally by its assessors land use code. It will also be necessary to ensure that no housing authority-owned properties containing SHI Eligible Housing are

¹² <http://www.mass.gov/dor/docs/dls/bla/classificationcodebook.pdf>

¹³ "x" is a placeholder for additional digits

¹⁴ 97x is housing authority-owned property. Exception: housing authority-owned property that contains SHI Eligible Housing units must NOT be excluded from the Total Land Area.

excluded. Parcels meeting these criteria can be excluded from the Total Land Area calculation by adding the following script to the definition query:¹⁵

```
AND NOT (  
  
(GLAM_[MunicipalityName]_Total_Land_Area.USE_CODE LIKE '90%' OR  
GLAM_[MunicipalityName]_Total_Land_Area.USE_CODE LIKE '91%' OR  
GLAM_[MunicipalityName]_Total_Land_Area.USE_CODE LIKE '92%' OR  
GLAM_[MunicipalityName]_Total_Land_Area.USE_CODE LIKE '93%' OR  
GLAM_[MunicipalityName]_Total_Land_Area.USE_CODE LIKE '97%' OR  
GLAM_[MunicipalityName]_Total_Land_Area.USE_CODE LIKE '98%' OR  
GLAM_[MunicipalityName]_Total_Land_Area.USE_CODE LIKE '991%' OR  
GLAM_[MunicipalityName]_Total_Land_Area.USE_CODE LIKE '992%' OR  
GLAM_[MunicipalityName]_Total_Land_Area.USE_CODE LIKE '993%' OR  
GLAM_[MunicipalityName]_Total_Land_Area.USE_CODE LIKE '994%')  
  
AND GLAM_[MunicipalityName]_SHI_Sites.MuniName IS NULL)
```

Additional publicly-owned parcels not captured by the queries above (due to nonstandard, null, or outdated land use code) can be excluded individually by specifying their LOC_ID in the definition query as follows:

```
[...] AND NOT GLAM_[MunicipalityName]_Total_Land_Area.LOC_ID = '[Unique_LOC_ID]'
```

For each additional LOC_ID, another “AND NOT” query may be added, always inside the final parenthesis. Each individual exclusion requires documentation of ownership by a Political Subdivision. Property leased, rented, or occupied by a political subdivision but not owned by another entity shall not be excluded.

Provide a map showing Total Land Area.

Submit the selected and matched assessor records as an Excel spreadsheet, which should verify public ownership of each parcel.

2.10. Calculate Total Land Area.

Create a new feature class by exporting **GLAM_[MunicipalityName]_Total_Land_Area** and naming the Output Feature Class **GLAM_[MunicipalityName]_Total_Land_Merge**. Turn on the Editor tool and start an editing session. Turn off all other layers and select all features shown in the map display at its full extent. Select “Merge” from the Editor menu and select any feature to merge the other features to. There should now only be a single attribute for this layer. Find the field called “Acres” (or add that field if it does not already exist) and use the “Calculate Geometry” to determine the Total Land Area, in acres.

¹⁵ Double parentheses are required as part of the definition query to ensure the correct order of operations. In this example query line breaks have been added for clarification purposes; these are not necessary for the actual query. It may help to add one use code at a time, ensuring closed parentheses with each addition, to ensure that the query has been defined properly. Additional exclusions should always be placed inside the final parenthesis of the query.

Step 3: Calculate SHI Eligible Area

The numerator of the General Land Area Minimum calculation may only include the portion of each SHI Site that is “occupied by SHI Eligible Housing units (including impervious and landscaped areas directly associated with such units).” “Impervious and landscaped areas directly associated with such units” are further described under the definition of “Directly Associated Area” in these guidelines

This section describes how the parcel data for each SHI Site should be edited to remove non-associated areas. The resulting area must then be prorated based on the share of SHI Eligible Housing Units on the parcel.

3.1. Remove any areas that are not Directly Associated Areas from SHI Site area

Export **GLAM_[MunicipalityName]_SHI_Sites** to a new feature class called **GLAM_[MunicipalityName]_SHI_Sites_DA**. The Board and the Analyst should review each site to determine the boundaries of Directly Associated areas. Overlay current aerial imagery¹⁶ and edit SHI Sites polygons (using the Editor tool) to exclude areas that do not qualify as Directly Associated as defined above. If the Board would like to include an area that appears heavily vegetated in the aerial imagery, it must provide photographs and other documentation about the development to demonstrate that the vegetated area is directly associated with the development. Similarly, if the Board would like to include other areas as Directly Associated, such as impervious surfaces or landscaping at the ground level that cannot be seen from aerial imagery,, it must provide photographs and other documentation about the development to demonstrate that the area is Directly Associated with the development. For sites where the aerial imagery does not depict current conditions, or where permitted SHI Eligible Housing units have not yet been constructed, the SHI Sites should be edited accordingly in an Esri-compatible format, reflecting current conditions or development plans for SHI Eligible Housing units. The Board must provide site plans, photographs, and any other supplemental materials that document site conditions for any edited SHI Sites.

As wetlands are not considered Directly Associated Areas, clip the MassDEP Wetlands (1:12,000) WETLANDSDEP_POLY datalayer¹⁷ to the extent of the municipality and export the resulting records to the file geodatabase as a feature class called **GLAM_[MunicipalityName]_Wetlands**. If more detailed regulatory wetland boundaries have been surveyed and accepted by the local Conservation Commission, these boundaries may be used. If so, boundaries must be provided as a feature class clipped to the municipal boundary called **GLAM_[MunicipalityName]_Local_Wetlands**. The supplementary documentation must include a PDF of the corresponding Order of Resource Area Delineation¹⁸ or Order of Conditions, including maps of the surveyed wetland boundary, in Esri-compatible formats.

3.2. Review SHI Sites for any overlap with exclusions

Next overlay the **GLAM_[MunicipalityName]_Exclusions** layer and ensure there is no overlap between the **GLAM_[MunicipalityName]_SHI_Sites_DA** polygons and any areas excluded from the Total Land Area. Remove any overlapping areas from SHI_SITES_DA by manually editing or using the Erase tool if available.

¹⁶ MassGIS has purchased a subscription for direct access to the latest high-quality Google ortho imagery. It provides all agencies and political subdivisions of the Commonwealth with Google's most current 6-inch resolution, natural color aerial imagery for all of Massachusetts. <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/googleimagery.html>

¹⁷ <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/depwetlands112000.html>

¹⁸ <http://www.mass.gov/eea/agencies/massdep/service/approvals/wpa-form-4b.html>

3.3. Calculate the SHI-Eligible Area (not yet prorated).

Using the **GLAM_[MunicipalityName]_SHI_Sites_DA** feature class, calculate the land area (in acres) of the edited polygon in a new field named “eligible_area.” Copy the values into the corresponding record in the SHI Sites Submission List table.¹⁹

Provide a map (using the same naming convention as above, and formatted as per the submittal requirements) depicting the eligible portion of each SHI Site. Create a separate map image of each development with the edited boundaries of the eligible area overlaid on the most recent aerial imagery. Label each site so that DHCD can match the appropriate records in the SHI Sites List.

3.4. Calculate prorated SHI-Eligible Area.

The Comprehensive Permit and Subsidized Housing Inventory Guidelines differentiate how rental and ownership units are counted on the SHI. For rental and assisted living projects, “if at least 25% of units are to be occupied by Income Eligible Households earning 80% or less than the area median income, or alternatively, if at least 20% of units are to be occupied by households earning 50% or less of area median income,”²⁰ and meet all other applicable SHI eligibility criteria, then all of the units in the development project are eligible for inclusion in the SHI. As such, in General Land Area Minimum calculations, the whole “eligible_area” may be counted towards the numerator. For rental and Assisted Living Facility developments in which less than 25% or 20% of the units are to be occupied by Income Eligible Households earning at or below 80% or 50% of the area median income, respectively, the SHI-Eligible Area must be prorated accordingly.

For homeownership and Continuum of Care Retirement Communities (CCRs), only the deed-restricted low-income housing units count towards the SHI, and so the SHI Eligible Area for mixed-income homeownership parcels and CCRs must also be prorated accordingly. Add a field to the SHI_Sites.xlsx file called “pct_eligible” and set all values to 100%. For SHI Eligible developments with both deed-restricted and market rate units on the same parcel, set the value to the percent of deed-restricted units. This will not be necessary for deed-restricted units on their own parcel, only for CCRs or condominium developments with a mix of market and deed-restricted units. Then create a new field titled “prorated_area” and calculate this field as a product of “eligible_area” X “pct_eligible.”

Finally, check to ensure the prorated area is not larger than the lot area that would be required by local zoning for an equivalent number of units.²¹ Add a field for “ac_p_unit” and specify the minimum lot area (in acres) required *per unit* from the underlying zoning district, or any as-of-right overlay district, whichever is lower (higher density). Multiply this field by the number of SHI Eligible Housing units in a new field titled “reqlotarea.” If the prorated area exceeds this required lot area, the excess acreage will not be considered Directly Associated with the development and will not count toward the SHI-Eligible Area. Create a new field entitled “SHI_area” and populate it with either “prorated area” or “required lot area,” whichever is less.

Step 4: Calculate Results

4.1. Calculate results and preliminary determination of 1.5% General Land Area Minimum.

In a separate worksheet, calculate the General Land Area Minimum. Enter the sum of “SHI_area” from the **GLAM_[MunicipalityName]_SHI_Sites.xlsx** file in a field titled “SHI_area” Enter the Group Homes Acreage Calculation provided by DHCD in a field titled “GroupHomes.” Enter the value for “TotArea” from the **GLAM_[MunicipalityName]_Total_Land_Area** feature class. Add “SHI_area” to “GroupHomes” and divide by “TotArea” to determine the municipality’s General Land Area percenta

¹⁹ Sort the records by LOC_ID before copying the values, and sort the SHI Sites Submission List table the same way.

²⁰ <http://www.mass.gov/hed/docs/dhcd/legal/comprehensivepermitguidelines.pdf>, II-4

²¹ For lots where the underlying zoning district is commercial or industrial, lot area in excess of what would be required under the highest density as-of-right residential zoning district or overlay district for the proposed number of SHI-Eligible Housing units generally will not be considered Directly Associated.