PURCHASING DEPARTMENT

TOWN OF ARLINGTON
730 Massachusetts Avenue
Arlington, MA 02476

Telephone 781.316.3003
Fax 781.316.3019

April 12, 2024

Request for Qualifications (RFQ) #24-20

Networked Geothermal Feasibility Study

ADDENDUM NO. 2

The attention of individuals and firms submitting responses to the above-referenced RFQ is directed to the following Addendum. The purpose of this Addendum is to revise the scope and to answer questions from interested parties.

1. Change in Scope

a) The Town has amended the scope of work. Changes generally consist of clarifying the content of deliverables and available data in support of these deliverables, as well as the role of Town staff versus the vendor team with regard to community engagement. A version of the amended RFQ with redlined changes and a clean version of the RFQ are attached hereto.

2. Questions from Interested Parties

a) Question: Do you expect the contractor to engage your community, or do you just need the technical experts within the contractor group to appear at preplanned meetings?

   Answer: We have amended the RFQ to specify that the Town will lead community engagement, with input and participation from the respondent.

b) Question: Are virtual meetings acceptable?

   Answer: Virtual meetings are acceptable, particularly for internal team check-in meetings. There may be a community engagement activity which the respondent will be expected but not required to attend.

c) Question: Do you require the respondent to include the drilling of test boreholes and analysis or is geologic review and non-drilling alternative analysis sufficient?

   Answer: The respondent should include the drilling of at least one test borehole to confirm site geological information but not necessarily at the full depth of a production scale borehole.

d) Question: Will the Town of Arlington accept budget proposals that exceed $50,000? Does a proposed budget that exceeds the HEET grant amount result in a disqualification of the respondent? Will proposals exceeding the budget be considered if accompanied by a plan to finance the extra expenses?

Answer: The Town only has $50,000 in funding to contribute to this project at this time and therefore will not accept budget proposals that exceed this amount. The Town has amended the scope of the project to clarify the contributions that the Town expects the respondents to make to the final report and specific tasks outlined for Tier 2 recipients on page 5 of the HEET Kickstart Mass description attached to the RFQ. The Town has also clarified the existing data and other resources that will be available to the respondent.

e) Question: Will the Town of Arlington provide any of the following information upon award?
    a. Assessment of building heating/cooling needs:
        i. Building names, use type, and ownership
        ii. Number of buildings per parcel
        iii. Building use and daily operating hours
        iv. Area: square footage and floors
        v. Building age
        vi. Energy consumption and fuel type(s).
            1. Community choice electric rate (Y/N).
    b. Survey of Building heating/cooling and related systems including:
        i. HVAC System Age
        ii. Heating system(s)
        iii. Cooling system(s)
        iv. Domestic Hot Water System

Answer: The Town will provide all data points itemized in Section 2 of the “Additional Reporting Requirement for Tier 2 Grant Recipients” noted in the HEET Kickstart Mass description attached hereto.

f) Question: What is desired for thermal energy modeling in the context of "Survey and assessment of buildings…” on page 3 of the RFQ? For example, is this thermal energy modeling of the network or the buildings?

Answer: The thermal energy modeling should be of the network (ground loop route and approximate well sites) as well as the buildings. The Town will provide existing energy data and models for the Thompson Elementary School and one typical Menotomy Manor building, which the respondent will be expected to use to estimate the appropriate network size and layout. The respondent will be expected to use available geological information to estimate size and placement of the ground loop. Results of this modeling will be peak summer and winter thermal loads in Btu/hr and the corresponding total distance of heat exchange pipe needed to satisfy these loads using standard IGSHPA pipe sizes and flow rates.

g) Question: What is the minimum "Survey and assessment of buildings" required? Should this include a site visit or is a conditions assessment by other means acceptable?

Answer: Although the Town will be providing much of the data for Section 2 of the "Additional Reporting Requirement for Tier 2 Grant Recipients" noted in the HEET Kickstart Mass description attached to the RFQ, a site visit is preferred. The Town asks that respondents indicate whether they intend to complete an in-person site visit.

h) Question: Can you share your HEET slide deck and HEET Grant application?

Answer: The Town's HEET Grant Application as well as the Town's slides from the first kick-off meeting with all grant recipients (which describe high-level information about the project such as project team, motivations, and potential sites) are now attached hereto.

i) Question: How much information would you like—just the Statement of Qualifications for now?

Answer: The Town expects respondents to provide all requested information detailed in the RFQ document.

j) Question: Would a vendor's participation in the feasibility study preclude them from consideration for the execution of the project if/when it comes to fruition?

Answer: A vendor's participation in the feasibility study does not preclude them from consideration for the execution of the project.

k) Question: The estimated budget in the RFQ allocates $10,000 for "drilling and testing". Can you please clarify the intended scope of that line item? Are you expecting $10,000 to cover the full cost of test borehole drilling, loop installation, and thermal conductivity testing (TCT)?

Answer: The modified RFQ no longer recommends a specific dollar amount for drilling and testing. As noted above, the Town requires that the respondent include the drilling of at least one test borehole to confirm site geological information, and not necessarily at the full depth of a production scale borehole. The Town asks that respondents propose a budget necessary to accomplish this test borehole.

l) Question: Are the school and housing development already engaged as intended anchor tenant(s)? The RFQ implies that the Electrify Arlington campaign and HEET will be conducting community engagement activities; can you clarify the goal/intended outcome of additional vendor-led community engagement? E.g. Will the vendor be responsible for recruiting offtakers, residential or otherwise, to participate in the project?

Answer: The school and housing development are already engaged as potential anchor tenants. As the revised RFQ clarifies, the vendor will be expected to contribute content (e.g., slides, data) and potentially participate in, but not lead, the engagement activities. The vendor will not be responsible for recruiting additional offtakers.

All other terms and conditions of the RFQ remain unchanged.

ADDENDUM MUST BE ACKNOWLEDGED IN THE RESPONDER'S SUBMISSION. FAILURE TO ACKNOWLEDGE ANY OR ALL ADDENDA COULD RESULT IN REJECTION OF YOUR SUBMISSION AS NON-RESPONSIVE.

James Feeney
Town Manager

REQUEST FOR QUALIFICATIONS (RFQ)
NETWORKED GEOTHERMAL FEASIBILITY STUDY
RFQ #24-20

The Town of Arlington, through the Department of Planning and Community Development (DPCD), seeks statements of qualifications from qualified individuals or firms to conduct a feasibility analysis of a single closed loop networked geothermal system (also known as a networked ground source heat pump system) in the East Arlington neighborhood near the Thompson Elementary School and the Menotomy Manor housing development. The Town has received a grant from the HEET Kickstart Mass program, funded by the Massachusetts Clean Energy Center (CEC) and will award $50,000 to the selected vendor for:

- Contribute to Town-led ~~Robust~~ community engagement ~~in the community~~ on networked geothermal systems;
- Evaluation of potential site(s) and buildings in the geothermal system; and
- Preliminary design and cost estimates for installation ~~and operation~~.

Costs for the above activities will be carried by the chosen vendor. The $50,000 award is inclusive of all project costs assumed within the term of the contract.

For further information contact Talia Fox, Sustainability Manager, at tfox@town.arlington.ma.us.

Statements of qualifications will be received by the Sustainability Manager on or before 10:00 AM, April 25, 2024, at tfox@town.arlington.ma.us. Responses delivered after the appointed time and date will not be considered. Questions or requests for interpretation of this Request for Qualifications shall be emailed to tfox@town.arlington.ma.us and to be given consideration must be received at least 7 days prior to the Statement of Qualifications deadline. Any and all such interpretations and any supplemental instructions will be in the form of written addenda posted electronically to the Town's website at www.arlingtonma.gov/purchasing.

The Town reserves the right to cancel any request for qualification, and to reject in whole or in part any and all statements of qualification, when it is deemed in the best interests of the Town to do so.

REQUEST FOR QUALIFICATIONS
TOWN OF ARLINGTON

NETWORKED GEOTHERMAL FEASIBILITY STUDY

Responses Due:	April 25, at 10:00 AM Late Responses Will Be Rejected
Deliver Complete Responses to/ for Further Information Please Contact:	Talia Fox Sustainability Manager tfox@town.arlington.ma.us

I. OVERVIEW OF OPPORTUNITY

The Town of Arlington has received a grant from HEET as part of the Kickstart Mass program funded by the Massachusetts Clean Energy Center (MassCEC). The purpose of the Kickstart Mass program is to develop a pipeline of shovel-ready geothermal network sites whose readiness attracts funding for the next stage of implementation. The Town will work with a vendor to conduct a feasibility analysis of a single closed loop networked geothermal system in the East Arlington neighborhood near the Thompson Elementary School and Menotomy Manor housing development.

The study will assess the potential of networked geothermal at the selected anchor site(s), which include a playing field adjacent to the Thompson School and possibly lawn space at Menotomy Manor. The feasibility study will take 6-9 months to complete, with a Final Report due at the end of 2024. The study will consider the unique opportunities and challenges to the design and implementation of the chosen networked geothermal system.

The Town of Arlington will engage in this work through the Department of Planning and Community Development, which is responsible for climate mitigation and adaptation planning. Other stakeholders to be involved in the project include the Arlington Housing Authority, Arlington Public Schools, and the Arlington Recreation Department, as well as residents via the Town campaign Electrify Arlington, community groups, and other channels.

The grantor will maintain an active role in this process. HEET, through the Kickstart Mass program, will help foster community engagement and education around the benefits of networked geothermal and how these systems work in homes and businesses. HEET will monitor progress on the feasibility study and help support successful outcomes by connecting the project with system designers, installers, and other industry professionals.

This project is funded through the HEET Kickstart Mass program for up to $50,000.

II. Scope of Services

The Town of Arlington seeks proposals from qualified individuals or firms to provide expert guidance and technical assistance in the assessment of the feasibility of the prospective networked geothermal installation; and to ~~facilitate robust~~ contribute to Town-led community engagement around the assessment. The scope of work should generally include:

- Site evaluation and characterization, including geological review;
- Participation in Town-led, public engagement to educate and elicit feedback around networked geothermal opportunities and challenges;
- Survey and assessment of buildings potentially suited for the networked geothermal approach, ~~including discrete~~ leveraging existing Town-provided building and thermal energy models for potential anchor sites ~~modeling~~;
- High-level regulatory review, including constraints and any unique regulatory elements;
- Technical analysis, including preliminary loop layout ~~and design~~ and relationship to existing gas network; and
- Estimation for installation ~~and operational~~ costs.

Staff Role

Town of Arlington staff, primarily from DPCD, will manage the project and take primary responsibility for assembly of the Final Report, with significant input from the vendor on schedule, approach, and deliverable content. The vendor is expected to devote the time needed to conduct research, prepare all technical analyses and drafts of relevant Final Report sections. Staff will take primary responsibility for planning and executing approximately two (2) engagement activities. The vendor may be asked to provide some input on technical content for these activities. Town staff will also provide all publicly available data, including utility, building, and energy data, for buildings on the proposed networked geothermal loop, as feasible. This includes an existing energy model for a typical building at Menotomy Manor, as well as a decarbonization study for the Thompson Elementary School that is being prepared as part of the MassCEC BETA decarbonization pilot program.

III. Milestones and Estimated Timelines

Expected milestones and deliverables are listed in the table below. While the Town is open to adjustments, at a minimum, the vendor must address in its response sections 3 and 4 of "Base requirements for all grant recipients (Tiers 1 & 2)" and ~~the scope and~~ all sections of "Additional reporting requirement for Tier 2 grant recipients" ~~final report requirements (including the December 13, 2024, final report deadline)~~ provided by the grantor in the attachment entitled "Kickstart Grant Description." As noted above, the Town will provide all

publicly available data inputs and take primary responsibility for Final Report assembly, with input from the vendor. The vendor should also provide in its response an updated timeline addressing key milestones and deliverables along with a proposed project approach (see Section V, Submittal Requirements).

Date	Milestone	Description
5/1/24	Project kickoff	Work is expected to begin in early May, promptly following the Town's selection of a vendor. The project kick-off meeting should include, at minimum, review of the final project scope and timelines, roles, and expectations for communication.
6/1/24	Deliver characterization of proposed site	The vendor will assess the physical parameters (e.g., surficial and bedrock geology/hydrology, competing utility uses, potential site contamination), leveraging data and map applications from the MA Department of Environmental Protection, and additional data as needed; and identify, at a high level, state and local codes and regulations that influence the design, construction, and overall cost-effectiveness~~; and develop project evaluation criteria~~.
~~6/1/24~~	~~Develop and launch engagement plan~~	~~The engagement plan will include elements that can be accomplished within the vendor's budget and timeline, including, for example, public education events, door-to-door canvassing, neighborhood meeting(s), presentation(s) to the Menotomy Manor tenants' association and Thompson Elementary School students and families, on-site signage, and notice via Town channels.~~

9/1/24	Technical feasibility analysis deliverable	The vendor will assess capacity, constraints, and potential for expansion of the geothermal system~~. The specifics of the technical feasibility will be scoped in partnership with the community~~, with the goal of incorporating as much capacity as is desired and potential for growing the network to adjacent blocks in the neighborhood~~s~~. This stage includes drilling of the test borehole(s) to a depth sufficient to confirm site geological information, and not necessarily the full depth of a production scale borehole. The respondent is expected to cap and finish the borehole in a clean manner that will allow the Town to use it for public engagement regarding the planned heat network. The technical feasibility will include preliminary loop layout ~~and design (including potential for renewable energy, load diversity, etc., evaluation of piping network alternatives and building-side integration).~~ It will also include "conversion sequences" for the three most common building types in the project area. These conversion sequences will describe the existing gas-supplied equipment, how it meets occupants' needs, and identify the equipment (including electrical service) that would replace it when service lines convert from gas to geothermal.
11/1/24	Cost estimate	The vendor will provide an estimate for installation ~~and operational costs~~ for the project. The estimate will include key costs for full design and installation~~, as well as commissioning and operational costs. An important dimension of this analysis will be anticipating the ownership and governance structure for the utility.~~ These differences will shape who pays for the system and its maintenance.
~~11/15/24~~	~~Draft of final report due to the Town~~	~~The vendor will share a draft of the final report that allows for sufficient time for review and revision prior to final submission to the grantor. The final report must include, at minimum, the information detailed in the attached document "Kickstart Grant Description."~~
12/13/24	Final report due to grantor	The Town will receive and report on the final deliverables to the grantor.

IV. Budget

The Town of Arlington was awarded funding in the amount of $50,000. Funds will be disbursed to the Town in two increments of $25,000, one upon execution of the grant contract, and one following submission of the final report in December 2024. Payment to the vendor cannot be made before funds have been disbursed to the Town. Payment will be remitted by the Town to the vendor in accordance with a schedule to be agreed upon.

~~Below is an estimated budget for the completion of the feasibility study. The table provides a sample, high-level breakdown of this grant funding across the primary vendor, outreach and engagement, as well as the estimated cost of drilling the test borehole(s). The Town welcomes adjustment to the budget breakdown below, to the extent that the full scope is still accomplished.~~ The vendor should submit a budget breakdown along with a proposed project approach (see Section V, Submittal Requirements) that reflects a detailed scope, including a proposed number of ~~key~~ internal~~/community~~ meetings and time required for key deliverables. The fee is Not-to-Exceed $50,000 with the final amount to be negotiated with the highest ranked responder.

~~Expense~~	~~Amount~~
~~Consultant fee~~	~~$33,000~~
~~Outreach and engagement (including potential community partner stipends up to $4,000)~~	~~$7,000~~
~~Drilling and testing~~	~~$10,000~~
~~**Total Expenses**~~	~~$50,000~~

V. Submittal Requirements

Statements of qualifications must be submitted to the Sustainability Manager in electronic mail by the submittal deadline at tfox@town.arlington.ma.us. They should be submitted in one single, searchable PDF document, clearly labeled, as an electronic mail attachment or secure link in the body text of the electronic mail. Please include “RFQ #24-20 Networked Geothermal Feasibility Study – Statement of Qualifications” in the subject line of all correspondence.

~~*Price Proposal*~~
~~The Price Proposal should state the cost to provide the services in the proposed project approach, not to exceed $50,000 and should include a cost breakdown.~~

Statement of Qualifications

Interested qualified firms must submit a response addressing the objectives, scope and schedule described in this RFQ. Proposals shall include the following and shall be organized using each of the elements listed below as section headings:

A. Vendor and/or sub-Vendor Description: Provide a brief description of the firm/organization including size and area of specialization, location of headquarters, and location of office proposed to handle this project.
B. Project Team: Provide names, contact information, resumes, and office locations of key staff who will be assigned to the project. Each team member's education and qualifications shall be listed. The project manager shall be clearly identified. If different consultants will be teaming together, indicate who will be the day-to-day contact person/team.
C. Qualifications: Provide a description of how the vendor team meets the required experience and skill sets described in this RF~~P~~Q.
D. Additional Experience: Provide a description of the following:
    a. Experience with facilitation of participatory planning processes. Describe the vendor team's experience facilitating engagement processes that center community members in the development or design of a project. Provide details on one or more projects or initiatives where members of the vendor team were responsible for playing a facilitation role.
    b. Experience working in multi-racial, multicultural, or socially vulnerable groups. Describe the vendor team's experience with working on projects that involved integrating marginalized racial, cultural, or socially vulnerable groups in decision-making processes. Provide details on one or more projects or initiatives where members of the vendor team implemented meaningful inclusionary practices, fostered social connections, and managed power dynamics that centered social equity or building resilience.
    c. Experience managing projects. Describe the vendor team's experience with managing projects, including coordinating a project team and tracking a budget and deliverables. Provide details on one or more projects or initiatives where members of the vendor team were responsible for project management.
    d. Local expertise. Describe the vendor team's familiarity with the municipality or the region, including experience living and/or working in the municipality or region, and experience collaborating with local partners.
E. Scope of Services: Summarize the vendor team's understanding of the project and describe the vendor team's approach and plan for accomplishing the work listed herein. The vendor shall not delete any requested scope tasks.
F. Project Schedule, Budget, and Commitment: The vendor shall submit acknowledgment and commitment for the responsibilities, timeline of milestones

(including key internal/community meetings and deliverables), and budget for the proposed work described above. Any proposed changes to the breakdown of the budget above should be provided with an explanation.

G. References: The vendor team should provide three references. For each reference, list the contact name, their title and/or affiliation, a brief description of the project or initiative they'd be able to speak to, and their contact information (phone number and email address).
H. Required Forms: All required forms must be submitted with the proposal.
    a. Certificate of Non-Collusion
    b. Certificate of Tax Compliance
    c. Price Proposal Form

VI. Selection Criteria

All applicants must meet the following minimum requirements:

1. Experience successfully developing networked geothermal feasibility studies.
2. Desirable approach to the project, including a demonstrated understanding of all project components and public outreach needs.
3. Sufficient staffing plan and methodology, including professional qualifications of all project personnel.
4. Strength and credibility of client references. The Consultant shall demonstrate prior client satisfaction with working relationship, project and budget management capabilities, and technical expertise in developing similar projects.
5. Signing of the Certificate of Non-Collusion, Tax Compliance Certification, and Price Proposal Form to be submitted with the response to this RFQ.

When considering proposals, the Town will favor those respondents who have extensive experience providing similar services, submit a desirable approach, and describe adequate capacity (including staffing levels and scheduling). Each proposal will be evaluated based on how well it addresses these criteria. Responses to each section will be determined to be highly advantageous, advantageous, or not advantageous, based upon the following comparative evaluation criteria.

Category	Highly Advantageous	Advantageous	Not Advantageous
Organizational Experience	Applicant has at least five (5) years' experience consulting with municipalities on projects of similar size and scope to this project with successful completion of five (5) similar projects in the last five (5) years	Applicant has at least four (4) years' experience consulting with municipalities on projects of similar size and scope to this project with successful completion of three (3) similar projects in the last five (5) years	Applicant has at least three (3) years' experience consulting with municipalities on projects of similar size and scope to this project with successful completion of two (2) similar projects in the last five (5) years
Desirability of Approach	Applicant's response contains a clear, creative, and comprehensive plan that addresses the entire scope of work as presented in this RFQ	Applicant's response contains a clear plan that addresses most of the scope of work as presented in this RFQ	Applicant's response does not contain a clear plan to address the scope of work as presented in this RFQ
Organizational Capacity - Staffing	The project team has at least five (5) years' experience as consultants on relevant projects with successful completion of five (5) relevant projects in the last five (5) years	The project team has at least four (4) years' experience as consultants on relevant projects with successful completion of three (3) relevant projects in the last five (5) years	The project team has at least three (3) years' experience as consultants on relevant projects with successful completion of two (2) relevant projects in the last five (5) years
Organizational Capacity - Quality of References	All three (3) of the applicant's references indicate that services were satisfactory or better.	One (1) of the applicant's references indicates that the services were not satisfactory or better.	Two (2) or more of the applicant's references indicates that the project that services were not satisfactory or better.

VII. Awarding of Contract

The Town may schedule interviews with the three highest scoring applicants. The Town will rank the finalists based on consideration of the minimum criteria/qualifications, the comparative evaluation criteria, and the interview (if applicable).

The Town will begin discussion of final scope of services and fee negotiations with the top ranked applicant. If unsuccessful in the negotiations, the Town may attempt to negotiate with the next highest scoring applicant (and repeat that process) until successful. If negotiations with one or more of the finalists prove unsuccessful, the Town may reject all responses and may choose to re-advertise if deemed in the Town's best interest.

A Selection Committee will be convened to review proposals. Committee members will include staff from the Department of Planning and Community Development and may also include members of the community with expertise in networked geothermal systems or other clean energy systems.

The Town reserves the right to cancel any request for qualifications, and to reject in whole or in part any and all proposals, when it is deemed in the best interests of the Town to do so. The Town also reserves the right to seek additional information and revised proposals prior to selection of a vendor through written notice to all of the respondents.

CERTIFICATE OF NON-COLLUSION FORM

TOWN OF ARLINGTON

NETWORKED GEOTHERMAL FEASIBILITY STUDY

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification the word “person” shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

_____

Signature of Individual Submitting Bid or Proposal

_____

Name of Individual Submitting Bid or Proposal

_____

Name of Business

_____

Date

BY STATE LAW THIS NON-COLLUSION FORM MUST BE SIGNED AND SUBMITTED WITH THE BID OR PROPOSAL.

CERTIFICATE OF TAX
COMPLIANCE FORM

TOWN OF ARLINGTON

NETWORKED GEOTHERMAL FEASIBILITY STUDY

Pursuant to MGL Chapter 62C, Section 49A, I certify under the penalties of perjury that I have complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

_____

Social Security Number or Federal Identification Number

_____

Signature and Title of Individual or Responsible Corporate Officer

REQUEST FOR QUALIFICATIONS (RFQ)
NETWORKED GEOTHERMAL FEASIBILITY STUDY
RFQ #24-20

The Town of Arlington, through the Department of Planning and Community Development (DPCD), seeks statements of qualifications from qualified individuals or firms to conduct a feasibility analysis of a single closed loop networked geothermal system (also known as a networked ground source heat pump system) in the East Arlington neighborhood near the Thompson Elementary School and the Menotomy Manor housing development. The Town has received a grant from the HEET Kickstart Mass program, funded by the Massachusetts Clean Energy Center (CEC) and will award $50,000 to the selected vendor for:

- Contribute to Town-led community engagement on networked geothermal systems;
- Evaluation of potential site(s) and buildings in the geothermal system; and
- Preliminary design and cost estimates for installation.

Costs for the above activities will be carried by the chosen vendor. The $50,000 award is inclusive of all project costs assumed within the term of the contract.

For further information contact Talia Fox, Sustainability Manager, at tfox@town.arlington.ma.us.

Statements of qualifications will be received by the Sustainability Manager on or before 10:00 AM, April 25, 2024, at tfox@town.arlington.ma.us. Responses delivered after the appointed time and date will not be considered. Questions or requests for interpretation of this Request for Qualifications shall be emailed to tfox@town.arlington.ma.us and to be given consideration must be received at least 7 days prior to the Statement of Qualifications deadline. Any and all such interpretations and any supplemental instructions will be in the form of written addenda posted electronically to the Town's website at www.arlingtonma.gov/purchasing.

The Town reserves the right to cancel any request for qualification, and to reject in whole or in part any and all statements of qualification, when it is deemed in the best interests of the Town to do so.

REQUEST FOR QUALIFICATIONS
TOWN OF ARLINGTON

NETWORKED GEOTHERMAL FEASIBILITY STUDY

Responses Due:	April 25, at 10:00 AM Late Responses Will Be Rejected
Deliver Complete Responses to/ for Further Information Please Contact:	Talia Fox Sustainability Manager tfox@town.arlington.ma.us

I. OVERVIEW OF OPPORTUNITY

The Town of Arlington has received a grant from HEET as part of the Kickstart Mass program funded by the Massachusetts Clean Energy Center (MassCEC). The purpose of the Kickstart Mass program is to develop a pipeline of shovel-ready geothermal network sites whose readiness attracts funding for the next stage of implementation. The Town will work with a vendor to conduct a feasibility analysis of a single closed loop networked geothermal system in the East Arlington neighborhood near the Thompson Elementary School and Menotomy Manor housing development.

The study will assess the potential of networked geothermal at the selected anchor site(s), which include a playing field adjacent to the Thompson School and possibly lawn space at Menotomy Manor. The feasibility study will take 6-9 months to complete, with a Final Report due at the end of 2024. The study will consider the unique opportunities and challenges to the design and implementation of the chosen networked geothermal system.

The Town of Arlington will engage in this work through the Department of Planning and Community Development, which is responsible for climate mitigation and adaptation planning. Other stakeholders to be involved in the project include the Arlington Housing Authority, Arlington Public Schools, and the Arlington Recreation Department, as well as residents via the Town campaign Electrify Arlington, community groups, and other channels.

The grantor will maintain an active role in this process. HEET, through the Kickstart Mass program, will help foster community engagement and education around the benefits of networked geothermal and how these systems work in homes and businesses. HEET will monitor progress on the feasibility study and help support successful outcomes by connecting the project with system designers, installers, and other industry professionals.

This project is funded through the HEET Kickstart Mass program for up to $50,000.

II. Scope of Services

The Town of Arlington seeks proposals from qualified individuals or firms to provide expert guidance and technical assistance in the assessment of the feasibility of the prospective networked geothermal installation; and to contribute to Town-led community engagement around the assessment. The scope of work should generally include:

- Site evaluation and characterization, including geological review;
- Participation in Town-led, public engagement to educate and elicit feedback around networked geothermal opportunities and challenges;
- Survey and assessment of buildings potentially suited for the networked geothermal approach, leveraging existing Town-provided building and thermal energy models for potential anchor sites;
- High-level regulatory review, including constraints and any unique regulatory elements;
- Technical analysis, including preliminary loop layout and relationship to existing gas network; and
- Estimation for installation costs.

Staff Role

Town of Arlington staff, primarily from DPCD, will manage the project and take primary responsibility for assembly of the Final Report, with significant input from the vendor on schedule, approach, and deliverable content. The vendor is expected to devote the time needed to conduct research, prepare all technical analyses and drafts of relevant Final Report sections. Staff will take primary responsibility for planning and executing approximately two (2) engagement activities. The vendor may be asked to provide some input on technical content for these activities. Town staff will also provide all publicly available data, including utility, building, and energy data, for buildings on the proposed networked geothermal loop, as feasible. This includes an existing energy model for a typical building at Menotomy Manor, as well as a decarbonization study for the Thompson Elementary School that is being prepared as part of the MassCEC BETA decarbonization pilot program.

III. Milestones and Estimated Timelines

Expected milestones and deliverables are listed in the table below. While the Town is open to adjustments, at a minimum, the vendor must address in its response sections 3 and 4 of “Base requirements for all grant recipients (Tiers 1 & 2)” and all sections of “Additional reporting requirement for Tier 2 grant recipients” provided by the grantor in the attachment entitled “Kickstart Grant Description.” As noted above, the Town will provide all publicly available data inputs and take primary responsibility for Final Report assembly, with input

from the vendor. The vendor should also provide in its response an updated timeline addressing key milestones and deliverables along with a proposed project approach (see Section V, Submittal Requirements).

Date	Milestone	Description
5/1/24	Project kickoff	Work is expected to begin in early May, promptly following the Town's selection of a vendor. The project kick-off meeting should include, at minimum, review of the final project scope and timelines, roles, and expectations for communication.
6/1/24	Deliver characterization of proposed site	The vendor will assess the physical parameters (e.g., surficial and bedrock geology/hydrology, competing utility uses, potential site contamination), leveraging data and map applications from the MA Department of Environmental Protection, and additional data as needed; and identify, at a high level, state and local codes and regulations that influence the design, construction, and overall cost-effectiveness.
9/1/24	Technical feasibility analysis deliverable	The vendor will assess capacity, constraints, and potential for expansion of the geothermal system, with the goal of incorporating as much capacity as is desired and potential for growing the network to adjacent blocks in the neighborhood. This stage includes drilling of the test borehole(s) to a depth sufficient to confirm site geological information, and not necessarily the full depth of a production scale borehole. The respondent is expected to cap and finish the borehole in a clean manner that will allow the Town to use it for public engagement regarding the planned heat network. The technical feasibility will include preliminary loop layout. It will also include "conversion sequences" for the three most common building types in the project area. These conversion sequences will describe the existing gas-supplied equipment, how it meets occupants' needs, and identify the equipment (including electrical service) that would replace it when service lines convert from gas to geothermal.

11/1/24	Cost estimate	The vendor will provide an estimate for installation for the project. The estimate will include key costs for full design and installation. These differences will shape who pays for the system and its maintenance.
12/13/24	Final report due to grantor	The Town will receive and report on the final deliverables to the grantor.

IV. Budget

The Town of Arlington was awarded funding in the amount of $50,000. Funds will be disbursed to the Town in two increments of $25,000, one upon execution of the grant contract, and one following submission of the final report in December 2024. Payment to the vendor cannot be made before funds have been disbursed to the Town. Payment will be remitted by the Town to the vendor in accordance with a schedule to be agreed upon.

The vendor should submit a budget breakdown along with a proposed project approach (see Section V, Submittal Requirements) that reflects a detailed scope, including a proposed number of internal meetings and time required for key deliverables. The fee is Not-to-Exceed $50,000 with the final amount to be negotiated with the highest ranked responder.

V. Submittal Requirements

Statements of qualifications must be submitted to the Sustainability Manager in electronic mail by the submittal deadline at tfox@town.arlington.ma.us. They should be submitted in one single, searchable PDF document, clearly labeled, as an electronic mail attachment or secure link in the body text of the electronic mail. Please include “RFQ #24-20 Networked Geothermal Feasibility Study – Statement of Qualifications” in the subject line of all correspondence.

Statement of Qualifications
Interested qualified firms must submit a response addressing the objectives, scope and schedule described in this RFQ. Proposals shall include the following and shall be organized using each of the elements listed below as section headings:

A. Vendor and/or sub-Vendor Description: Provide a brief description of the firm/organization including size and area of specialization, location of headquarters, and location of office proposed to handle this project.
B. Project Team: Provide names, contact information, resumes, and office locations of key staff who will be assigned to the project. Each team member’s education and qualifications shall be listed. The project manager shall be clearly identified. If

different consultants will be teaming together, indicate who will be the day-to-day contact person/team.

C. Qualifications: Provide a description of how the vendor team meets the required experience and skill sets described in this RFQ.
D. Additional Experience: Provide a description of the following:
    a. Experience with facilitation of participatory planning processes. Describe the vendor team's experience facilitating engagement processes that center community members in the development or design of a project. Provide details on one or more projects or initiatives where members of the vendor team were responsible for playing a facilitation role.
    b. Experience working in multi-racial, multicultural, or socially vulnerable groups. Describe the vendor team's experience with working on projects that involved integrating marginalized racial, cultural, or socially vulnerable groups in decision-making processes. Provide details on one or more projects or initiatives where members of the vendor team implemented meaningful inclusionary practices, fostered social connections, and managed power dynamics that centered social equity or building resilience.
    c. Experience managing projects. Describe the vendor team's experience with managing projects, including coordinating a project team and tracking a budget and deliverables. Provide details on one or more projects or initiatives where members of the vendor team were responsible for project management.
    d. Local expertise. Describe the vendor team's familiarity with the municipality or the region, including experience living and/or working in the municipality or region, and experience collaborating with local partners.
E. Scope of Services: Summarize the vendor team's understanding of the project and describe the vendor team's approach and plan for accomplishing the work listed herein. The vendor shall not delete any requested scope tasks.
F. Project Schedule, Budget, and Commitment: The vendor shall submit acknowledgment and commitment for the responsibilities, timeline of milestones (including key internal/community meetings and deliverables), and budget for the proposed work described above. Any proposed changes to the breakdown of the budget above should be provided with an explanation.
G. References: The vendor team should provide three references. For each reference, list the contact name, their title and/or affiliation, a brief description of the project or initiative they'd be able to speak to, and their contact information (phone number and email address).
H. Required Forms: All required forms must be submitted with the proposal.
    a. Certificate of Non-Collusion
    b. Certificate of Tax Compliance
    c. Price Proposal Form

VI. Selection Criteria

All applicants must meet the following minimum requirements:

1. Experience successfully developing networked geothermal feasibility studies.
2. Desirable approach to the project, including a demonstrated understanding of all project components and public outreach needs.
3. Sufficient staffing plan and methodology, including professional qualifications of all project personnel.
4. Strength and credibility of client references. The Consultant shall demonstrate prior client satisfaction with working relationship, project and budget management capabilities, and technical expertise in developing similar projects.
5. Signing of the Certificate of Non-Collusion, Tax Compliance Certification, and Price Proposal Form to be submitted with the response to this RFQ.

When considering proposals, the Town will favor those respondents who have extensive experience providing similar services, submit a desirable approach, and describe adequate capacity (including staffing levels and scheduling). Each proposal will be evaluated based on how well it addresses these criteria. Responses to each section will be determined to be highly advantageous, advantageous, or not advantageous, based upon the following comparative evaluation criteria.

Category	**Highly Advantageous**	**Advantageous**	**Not Advantageous**
Organizational Experience	Applicant has at least five (5) years' experience consulting with municipalities on projects of similar size and scope to this project with successful completion of five (5) similar projects in the last five (5) years	Applicant has at least four (4) years' experience consulting with municipalities on projects of similar size and scope to this project with successful completion of three (3) similar projects in the last five (5) years	Applicant has at least three (3) years' experience consulting with municipalities on projects of similar size and scope to this project with successful completion of two (2) similar projects in the last five (5) years
Desirability of Approach	Applicant's response contains a clear, creative, and comprehensive plan that addresses the entire scope of work as presented in this RFQ	Applicant's response contains a clear plan that addresses most of the scope of work as presented in this RFQ	Applicant's response does not contain a clear plan to address the scope of work as presented in this RFQ

Category	Highly Advantageous	Advantageous	Not Advantageous
Organizational Capacity - Staffing	The project team has at least five (5) years' experience as consultants on relevant projects with successful completion of five (5) relevant projects in the last five (5) years	The project team has at least four (4) years' experience as consultants on relevant projects with successful completion of three (3) relevant projects in the last five (5) years	The project team has at least three (3) years' experience as consultants on relevant projects with successful completion of two (2) relevant projects in the last five (5) years
Organizational Capacity - Quality of References	All three (3) of the applicant's references indicate that services were satisfactory or better.	One (1) of the applicant's references indicates that the services were not satisfactory or better.	Two (2) or more of the applicant's references indicates that the project that services were not satisfactory or better.

VII. Awarding of Contract

The Town may schedule interviews with the three highest scoring applicants. The Town will rank the finalists based on consideration of the minimum criteria/qualifications, the comparative evaluation criteria, and the interview (if applicable).

The Town will begin discussion of final scope of services and fee negotiations with the top ranked applicant. If unsuccessful in the negotiations, the Town may attempt to negotiate with the next highest scoring applicant (and repeat that process) until successful. If negotiations with one or more of the finalists prove unsuccessful, the Town may reject all responses and may choose to re-advertise if deemed in the Town's best interest.

A Selection Committee will be convened to review proposals. Committee members will include staff from the Department of Planning and Community Development and may also include members of the community with expertise in networked geothermal systems or other clean energy systems.

The Town reserves the right to cancel any request for qualifications, and to reject in whole or in part any and all proposals, when it is deemed in the best interests of the Town to do so. The Town also reserves the right to seek additional information and revised proposals prior to selection of a vendor through written notice to all of the respondents.

CERTIFICATE OF NON-COLLUSION FORM

TOWN OF ARLINGTON

NETWORKED GEOTHERMAL FEASIBILITY STUDY

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification the word “person” shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

_____

Signature of Individual Submitting Bid or Proposal

_____

Name of Individual Submitting Bid or Proposal

_____

Name of Business

_____

Date

BY STATE LAW THIS NON-COLLUSION FORM MUST BE SIGNED AND SUBMITTED WITH THE BID OR PROPOSAL.

CERTIFICATE OF TAX
COMPLIANCE FORM

TOWN OF ARLINGTON

NETWORKED GEOTHERMAL FEASIBILITY STUDY

Pursuant to MGL Chapter 62C, Section 49A, I certify under the penalties of perjury that I have complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

_____

Social Security Number or Federal Identification Number

_____

Signature and Title of Individual or Responsible Corporate Officer

Kickstart Mass Program 2023-2024

Program Overview & Goals

With $450,000 from the Massachusetts Clean Energy Center, HEET established the Kickstart Mass program to fund feasibility studies for Massachusetts communities that have displayed interest in implementing geothermal networks. The program's objective is to develop a pipeline of shovel-ready geothermal network sites whose readiness attracts funding for the next stage of implementation.

Capital investment for deployment can come from a variety of sources, which could include:

- Investor-owned gas utilities transitioning to clean energy
- Federal programs that incentivize renewable energy deployment
- Energy service companies (ESCOs)

The Big Picture

Kickstart Mass is part of HEET's larger goal of accelerating national progress on the transition beyond gas to clean energy at the speed and scale that this moment in history demands. HEET's work is being done in parallel with state legislative and regulatory efforts and gas utility initiatives to decarbonize building heating and cooling. Working together towards a shared vision of net zero carbon emissions by 2050—as established by the Massachusetts Clean Energy and Climate Plan for 2050—offers our greatest chance of success.

As HEET works with state and local governments, utility companies, and customers to identify potential locations for geothermal networks in Massachusetts, the Kickstart Mass communities will be at the forefront of this statewide progress and will also serve as a national model for other states looking to support the proliferation of geothermal networks.

The Kickstart Mass projects, along with the Eversource and National Grid pilots underway in the Commonwealth, will provide essential information on the costs of installing and operating geothermal networks as well as system performance metrics. This information will amplify best practices and foster industry development and growth.

Program Background & History

The Commonwealth's policies provide a framework for advancing electrification as part of its overall strategy to combat climate change and achieve a sustainable energy future. The

Next-Generation Roadmap Act, signed into law in 2021, was developed as part of the Clean Energy and Climate Plan for 2050.

On-site greenhouse gas emissions from buildings can be eliminated by electrifying heating, domestic hot water, clothes dryers, and cooking. Off-site emissions can be reduced as electricity is increasingly produced from renewable sources. An approach that focuses on efficiency and reducing energy consumption will minimize the cost of investments necessary to transition at the scale and speed needed to reach the targets set by the Commonwealth.

In 2019, HEET commissioned a study to assess the feasibility of replacing aging gas infrastructure in Massachusetts with networked ground-source heat pumps—also known as geothermal networks or thermal energy networks— shared by buildings along a single street segment. The study found that geothermal networks:

- Increase the resilience of the electric grid by reducing peak electric demand, limiting strain on the grid and the potential for outages
- Reduce the need for utilities to add generation capacity as buildings are electrified. The costs utilities will avoid from reduced capital investments translate to savings that will protect consumers from rising electric bills
- Are technically capable of meeting a significant portion of the heating and cooling needs of buildings in low- to medium-density residential and mixed-use commercial districts as well as a smaller portion of high-density mixed-use settings in Massachusetts
- Can provide a viable alternative to natural gas, propane, fuel oil, or baseboard resistance-electric heating and help mitigate the environmental, health, and safety issues associated with the distribution and combustion of fossil fuels
- Use similar materials, installation methods, and permits used to install and repair gas pipes, meaning the gas utility workforce can transition with minimal retraining
- Enable a larger-scale, more rapid transition to clean thermal energy than the current building-by-building approach
- Provide equal access to customers of all income levels

Geothermal Network System Requirements

Kickstart Mass projects must adhere to the design parameters specified in this definition of geothermal networks and system components. Additional information and resources can be found in the Gas to Geo Wiki.

Best Practices for Communities Pursuing Geothermal Networks

At HEET, we like to take the old adage “knowledge is power” and think of it instead as “knowledge is empowering.” When people understand change, feel involved in it, and have opportunities to share their concerns and questions, an initiative is more likely to be adopted,

succeed and be replicated, which is the ultimate goal with geothermal networks—we want the initial installation to connect to additional networks and expand over time.

The best practices below are general guidelines for building a ladder of understanding and engagement. The more a community can build on this, the better—bringing more stakeholders into the process and listening to diverse voices and perspectives.

Members of the community

- Conduct community outreach to ensure a significant percentage of community members have at least heard of the geothermal network project and have a basic understanding that it provides renewable heating and cooling.
- Conduct outreach through multiple channels, taking into account language and cultural factors.
- Consider using HEET's Want Geo map—a great way to capture public interest in geothermal networks.

Community organizations

- Ensure sustainability advocacy groups, town sustainability committees, and other community-based organizations have a more detailed understanding of the benefits of geothermal networks and their important role in advancing building decarbonization (e.g., emissions reductions, increased safety, and better indoor air quality, resilience, lower utility costs, and being part of a larger strategy to transition our cities and towns off the gas system in line with state mandates).
- Enlist community members as leaders in community engagement and building grassroots support for the project.

Decision-makers

- Identify whether a geothermal network project could be synergistic with other sustainability efforts or planned infrastructure projects.
- Make stakeholders and decision-makers aware of the impacts and timeline of construction.

Potential customers of the geothermal network

- Once identified, contact customers in person and educate them thoroughly about the project, including any needed weatherization work and/or building retrofits.
- Collect signed letters of interest from interested parties before enrolling them in the project.
- Encourage participants to share their knowledge and experience with neighbors and others to further advance networked geothermal in the community.

Kickstart Mass Funding Levels

Tier 1 - Grants of up to $10,000
Tier 2 - Grants of up to $50,000

Community Forum & Networking

To facilitate the sharing of information and leveraging of knowledge among grant recipients, HEET will be hosting three webinars. These meetings will also serve as checkpoints for reporting progress, identifying obstacles, and sharing solutions and resources. Each community will be asked to share a 5-10 minute presentation on their progress at each meeting. (Additional meetings may be scheduled based on project needs and requests from grant recipients.)
Please note: Tier 2 funding recipients are required to attend all three meetings.

- Kickoff, March 27, 2024
    - MDEP preliminary assessment of each site and Q&A
- Progress Check, June ##, 2024
- Progress Check, September ##, 2024

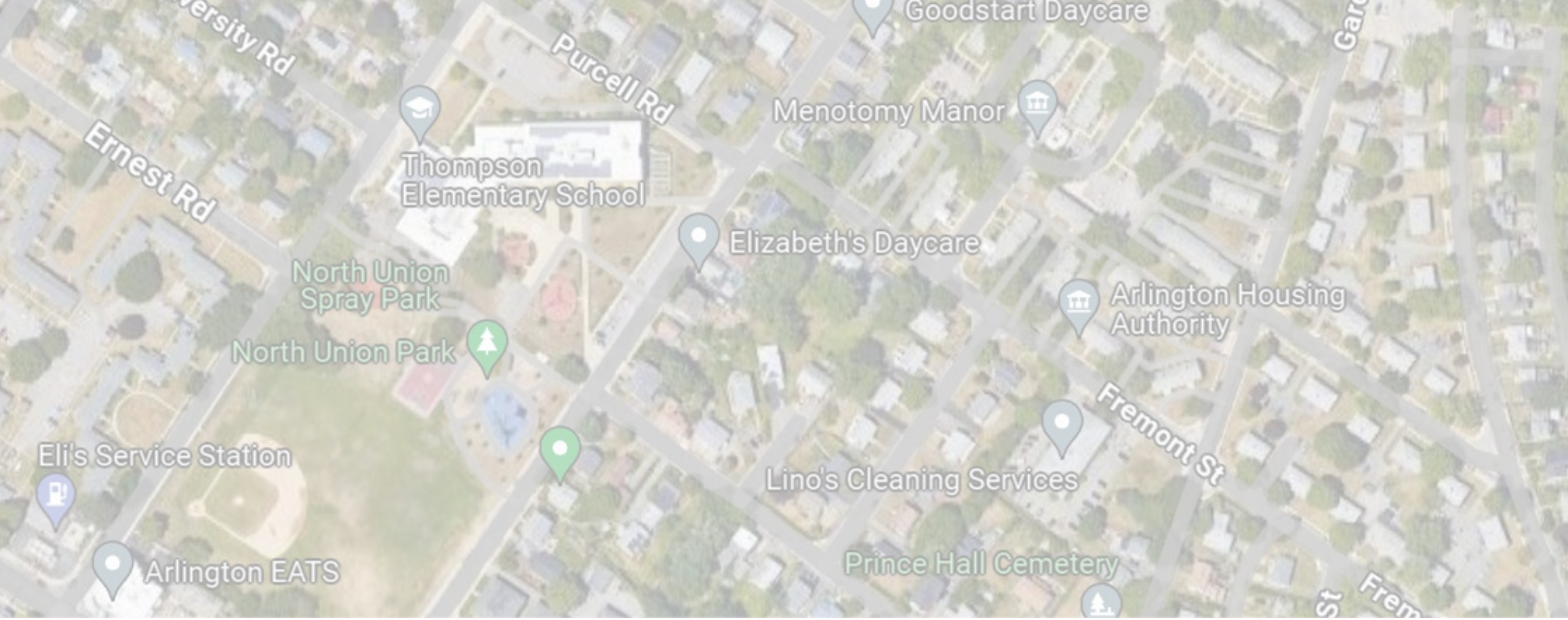
<u>Base requirements for all grant recipients (Tiers 1 & 2):</u>

1. Conduct robust community engagement to both educate and elicit feedback about the opportunities and concerns around networked geothermal for residents, and commercial and community nonprofits such as houses of worship.
2. Discuss the location of at least one site that provides an opportunity to deploy a geothermal network. Motivations could include, but are not limited to:
    a. Social impact / the story
    b. Developing a resilience hub
    c. There are willing participants
    d. Unique thermal resources- sources or sinks
3. Discuss why the cluster of buildings is well suited for a networked geothermal approach. Reasons could include, but are not limited to:
    a. Differing occupancies, and do not all experience their individual heating and cooling loads/peaks simultaneously. This permits load-sharing to improve energy efficiency, and the combined geothermal well field can be economically sized.
    b. Buildings rejecting a significant amount of thermal energy providing heat rejection from ice rinks, freezers/groceries, and waste cooling from data centers)
    c. Close proximity, so a heating/cooling loop can be economically installed
    d. Ownership and maintenance of the systems
    e. Barriers to installation (such as required permissions and variances) will be minimal.
4. Conduct a geological review

a. Description of geological formations to determine if drilling vertical wells is appropriate and/or cost-effective. Starting with the new DEP geological Maps for MA.

<u>Additional reporting requirement for Tier 2 grant recipients:</u>
A final report due on December 13, 2024 that includes the following information at minimum:

1. Analysis of identified site(s):
    a. Need for the community, which could include any of the following topics:
        i. Gas or electric grid constraints
        ii. Distal “end” of energy distribution systems
        iii. High energy prices
        iv. Gas leaks or pipeline replacement
    b. Deepen geological review
        i. Assessment of thermal prosumers for heat recovery and regulatory feasibility
        ii. Assessment of surface water heat exchange and regulatory feasibility
2. Survey and assessment of buildings
    a. Assessment of building heating/cooling needs:
        i. Building names, use type, and ownership
        ii. Number of buildings per parcel
        iii. Building use and daily operating hours
        iv. Area: square footage and floors
        v. Building age
        vi. Energy consumption and fuel type(s)
            1. Community choice electric rate (Y/N)
    b. Survey of Building heating/cooling and related systems including:
        i. HVAC System Age
        ii. Heating system(s)
        iii. Cooling system(s)
        iv. Domestic Hot Water System
    c. Barriers to electrifying local building stock
    d. Discussion of parallel studies or renovation projects being conducted for the participating buildings, if any.
3. Discrete building and thermal energy modeling
4. High-level regulatory review:
    a. Discussion of the regulatory process for conducting the study, if any.
    b. Discussion of any unique regulatory elements for implementation.



Powering East Arlington with Geothermal

Kickstart Mass Community Forum 1: March 27, 2024

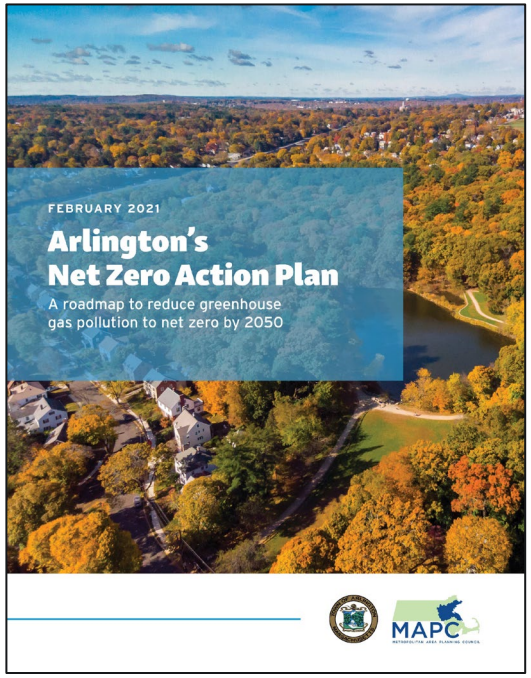
Talia Fox | Sustainability Manager, Town of Arlington | tfox@town.arlington.ma.us

Project Team & Partners

- Town of Arlington:
  - Talia Fox, Sustainability Manager
  - David Morgan, Conservation Agent/Environmental Planner
  - Damon Bosetti, Electrify Arlington volunteer coach
- Arlington Housing Authority
- Arlington Public Schools
- Arlington Recreation Department

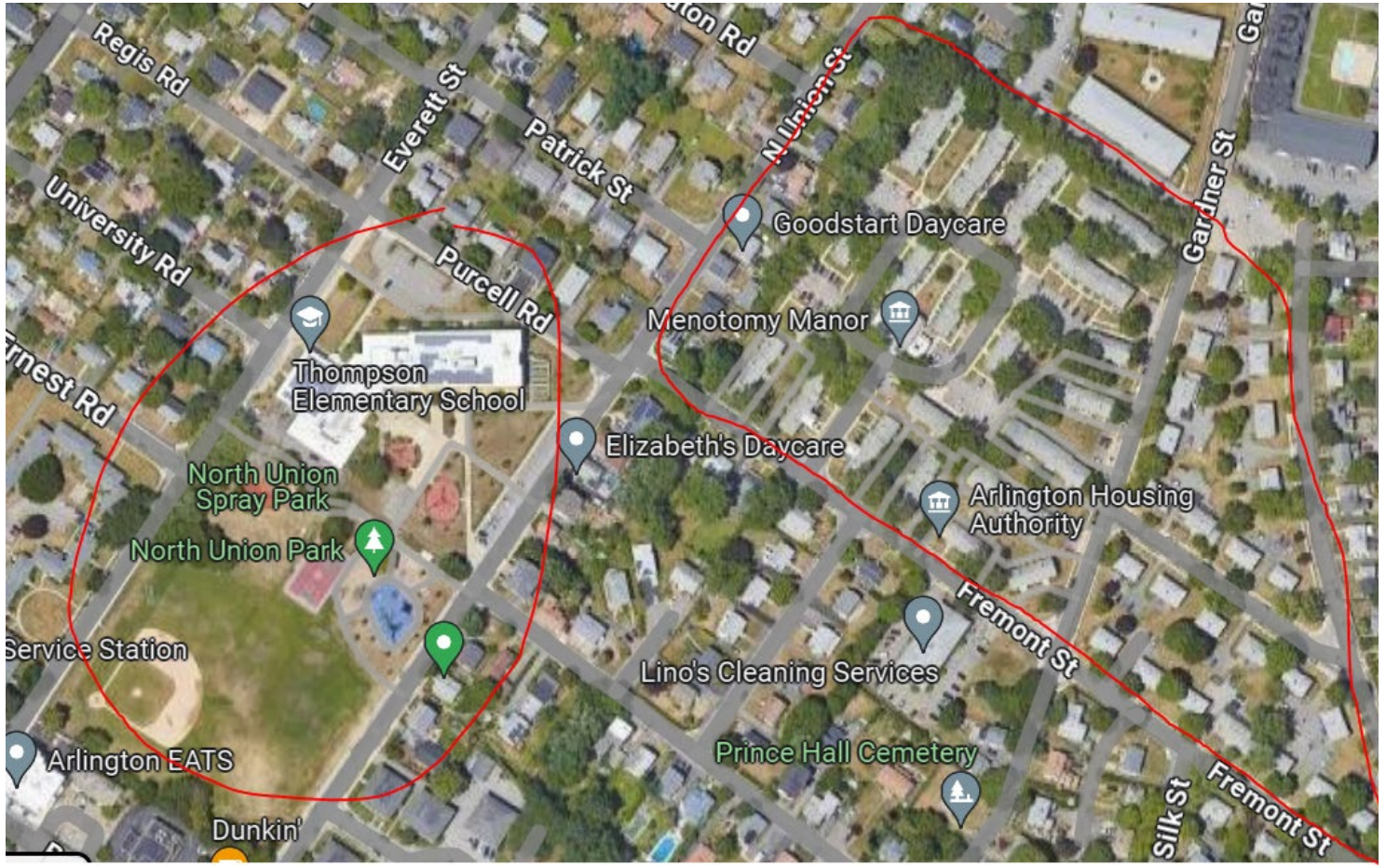
Motivations

- Town's net zero by 2050 goal
- Gas leaks / alternatives to natural gas
- Ongoing retrofit at Menotomy Manor affordable housing development
  - Decarbonize heating and provide cooling while minimizing costs for low-income tenants
  - Challenges with upfront and operational costs of air-source heat pumps
- Ideal potential anchor site (playing field next to school / development, splash pad)



Potential sites

- Thompson Elementary School / North Union Park
- Menotomy Manor (Arlington Housing Authority property)
- Surrounding residences and small businesses



POWERING EAST ARLINGTON WITH GEOTHERMAL ENERGY

A NETWORKED GEOTHERMAL FEASIBILITY STUDY PROPOSAL

ORGANIZATION INFORMATION

Organization legal name: Town of Arlington Department of Planning and Community Development
Mailing address: 730 Massachusetts Avenue
Organization phone: 781-316-3012
Organization web address: arlingtonma.gov

CONTACT INFORMATION

First name: David
Last name: Morgan
Title: Environmental Planner
Phone: 781-316-3012
Email: dmorgan@town.arlington.ma.us

First name: Talia
Last name: Fox
Title: Sustainability Manager
Phone: 781-316-3428
Email: tfox@town.arlington.ma.us

KEY STAKEHOLDERS

Arlington Housing Authority
Jack Nagle, Executive Director, jnagle@arlingtonhousing.org
Jack oversees the AHA portfolio and has conducted major infrastructure improvements, including an ongoing deep energy retrofit at Menotomy Manor, one of the target sites for this application. Jack represents the principal landholder and the residents of Menotomy Manor.

Electrify Arlington
Damon Bosetti, Electrify Arlington Volunteer Coach, bosetti@gmail.com
Electrify Arlington is a campaign led by the Town staff, the Clean Energy Future Committee, and volunteers to support an equitable and efficient transition to clean electricity in homes and vehicles, all in pursuit of the Town's goal of net zero greenhouse gas emissions by 2050. Damon is one of the Electrify Arlington Volunteer Coaches and has 13 years of professional experience working on networked utility hardware, including geothermal and heat pump technologies.

Arlington Public Schools
Rachel Oliveri, APS Sustainability Coordinator, roliveri@arlington.k12.ma.us
The Thompson Elementary school is a potential anchor site for the proposed networked geothermal system. Rachel manages the Arlington Public Schools' Green Teams and will support educational opportunities for students and parents interested in learning more about networked geothermal and its connection to climate change mitigation. She is an experienced project manager and educator of over 15 years with expertise in school waste reduction and diversion best practices and youth environmental education.

Arlington Recreation
Joseph Connelly, Director, jconnelly@town.arlington.ma.us
Joe directs the Town's self-sustaining Recreation Department, which manages the field next to the Thompson Elementary School, a potential anchor site for the networked geothermal proposed in this application. Joe has overseen many major capital improvement projects, most notably the recent renovation of Arlington Reservoir.

ORGANIZATIONAL TAX STATUS

Municipal agency, see attached proof of affiliation. See Planning Department staff here: https://www.arlingtonma.gov/departments/planning-community-development/contact-staff-list

PROJECT BUDGET

Please see Appendix A for a detailed budget.

The budget reflects costs for a consultant to provide expert guidance and technical assistance, municipal staff support, and community liaisons who have a strong connection with environmental justice and other priority populations. Fixed costs for engagement and a line item for a test borehole contractor are also included.

We have matched support for community liaisons to the in-kind rate for municipal staff, such that the participants are on equal footing with the project managers. It is important to the Town to center equity in the project facilitation as well as its focus. Paying participants for their time will enable a community-driven process without burdening residents.

TIMELINE & MILESTONES

Date	Milestone	Detailed Description (2-5 sentences)
1/30/24	Grant awarded	Town is notified of receipt of grant
3/1/24	Hire consultant	DPCD will release an RFP to solicit the support of an engineering consultant for the study of networked geothermal in the proposed site(s). Depending on responses, the Town anticipates the consultant team may include, without limitation, a geothermal designer, loop field subcontractor (driller), and public engagement coordinator.
4/1/24	Deliver Characterization of Proposed Site	The consultant will assess the physical parameters (e.g., surficial and bedrock geology/hydrology, competing utility uses, potential site contamination); identify state and local codes and regulations that influence the design, construction, and overall cost-effectiveness; and develop project evaluation criteria.
4/1/24	Develop and launch engagement plan	The engagement plan will include elements that can be accomplished within the consultant's budget and timeline, including, for example, public education events, door-to-door canvassing, neighborhood meeting(s), presentation(s) to the Menotomy Manor tenant's association and Thompson Elementary School students, on-site signage, and notice via Town channels. Coordination with MVP 2.0 stakeholders (i.e., environmental justice community liaisons) will be a key component of this plan.
5/1/24	Impact assessment deliverable	The consultant will set criteria for minimal environmental impact during and after construction, and anticipate environmental protection permitting requirements. Impact assessment will include

		social benefits such as considering the mutual benefits of fossil fuel free utility (e.g., health improvement, carbon and methane reduction). Economic benefits will be assessed in a later stage.
8/1/24	Technical feasibility analysis deliverable	The consultant will assess capacity, constraints, and potential for expansion. The specifics of the technical feasibility will be scoped in partnership with the community, with the goal of incorporating as much capacity as is desired and potential for growing the network to adjacent neighborhoods. This stage includes drilling of a test borehole. The technical feasibility will include preliminary loop layout and design (including potential for renewable energy, load diversity, etc., evaluation of piping network alternatives and building-side integration). It will also include "conversion sequences" for the three most common building types in the project area. These conversion sequences will describe the existing gas-supplied equipment, how it meets occupants' needs, and identify the equipment (including electrical service) that would replace it when service lines convert from gas to geothermal.
10/1/24	Energy and economic feasibility analysis	The consultant will anticipate installation and operational costs for the project. The analysis will include key costs for full design and installation (at minimum, perhaps also to include commissioning and operational costs), modeling energy performance, and quantifying benefits for inclusion in the social impact analysis. An important dimension of this analysis will be anticipating the ownership and governance structure for the utility. These differences will shape who pays for the system and its maintenance.
12/31/24	Complete feasibility study	The Town will receive and report on the final deliverables.

SECTION 1: COMMUNITY DEMOGRAPHICS

Please see the attached Census Bureau QuickFacts about Arlington for additional details.

Arlington is an urban/suburban community located eight miles west of Boston with a population of approximately 46,000.[1] The population density is approximately 9,000 people per square mile and the household size is 2.37 persons per household. Approximately 16% of the population is over 65 years of age.[2] Approximately 73% of the population is white, 14% Asian, 6% two or more races, and 5% Hispanic/Latino. Roughly 22% of the community speaks a language other than English at home (10% Other Indo-European languages, 8% Asian and Pacific Island languages, 3% Spanish, 1% Other languages).[3] The unemployment rate is 4% and 3% of families live below the poverty level. Median

[1] U.S. Census Bureau (2023). Housing Tenure, 2017-2021 American Community Survey 5-year estimates. Retrieved from https://data.census.gov/table/ACSSE2022.K202502?q=arlington+ma&t=Owner/Renter+(Tenure).

[2] U.S. Census Bureau (2023). ACS Demographic and Housing Estimates, 2017-2021 American Community Survey 5-year estimates. Retrieved from https://data.census.gov/table/ACSDP5Y2021.DP05?q=arlington+ma

[3] U.S. Census Bureau (2023). Language Spoken at Home, 2017-2021 American Community Survey 5-year estimates. Retrieved

household income is $125,701[4] and 25% of the population is low and moderate income (under 80% AMI).[5] Approximately 39% of homes are renter occupied.[6] The household energy burden is approximately 2%.[7]

Two trends are worth noting. First, Arlington is generally considered an aging community. While the population of persons over 65 is growing, the most rapid growth in age distribution[8] is in those aged 40-44. Second, Arlington has become less white since the 2010 Census, especially owing to a growing Asian (primarily Chinese) population.

1.1 Environmental Justice Communities

Please see the attached map. Approximately 42% of Arlington's population lives in an Environmental Justice (EJ) block group.[9] All of Arlington's EJ communities are considered minority; race is the most salient criterion for understanding environmental justice in Arlington.

SECTION 2: BUILDING TYPOLOGY AND ZONING MAP

Town of Arlington data index 15,604 parcels. Arlington's population dramatically expanded between 1900-1950, when 57% of the building stock was constructed (8,600 buildings). The second half of the 20th century saw the construction of 30% (4,546) of Arlington's current buildings. Thus far in the 21st century, 797 buildings have been constructed.

---

from https://data.census.gov/table?q=arlington+ma&t=Language+Spoken+at+Home

[4] U.S. Census Bureau (2023). Selected Economic Characteristics, 2017-2021 American Community Survey 5-year estimates. Retrieved from https://data.census.gov/table?q=arlington+ma&t=Employment

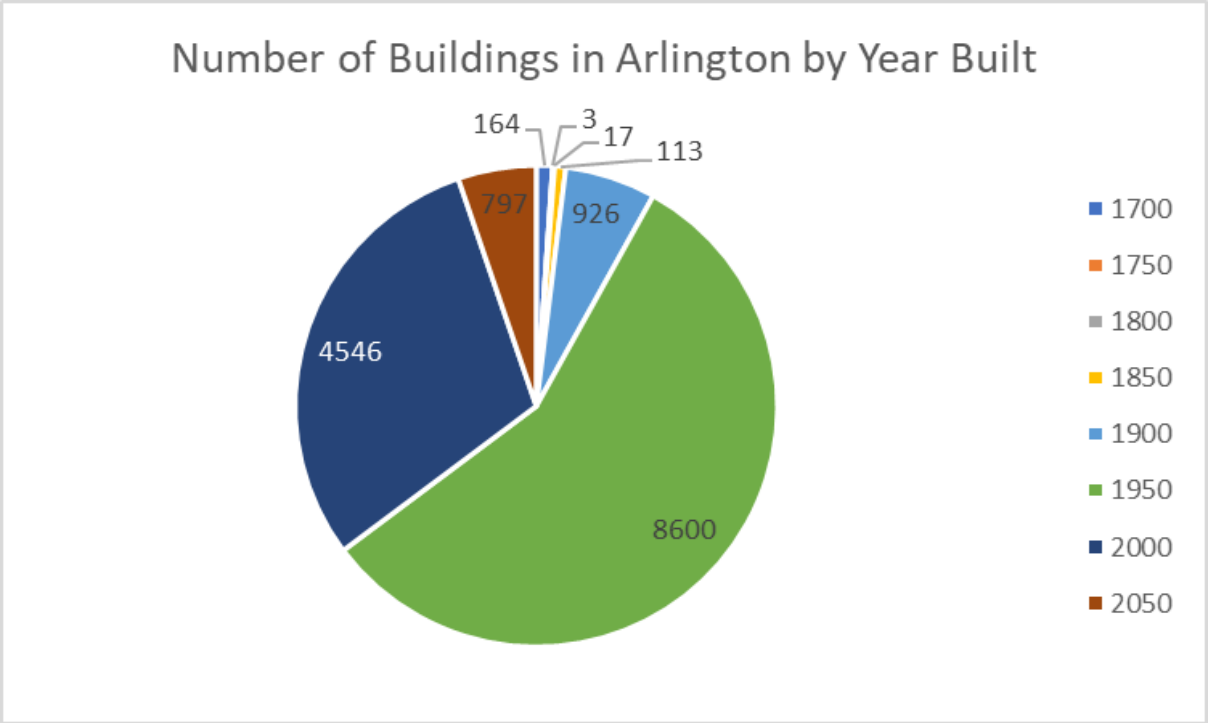
[5] U.S. Department of Housing and Urban Development (2023). American Community 5-Year Survey 2011-2015 Low and Moderate Income Summary Data.

[6] U.S. Census Bureau (2023). ACS Demographic and Housing Estimates, 2017-2021 American Community Survey 5-year estimates. Retrieved from https://data.census.gov/table/ACSDP5Y2021.DP05?q=arlington+ma

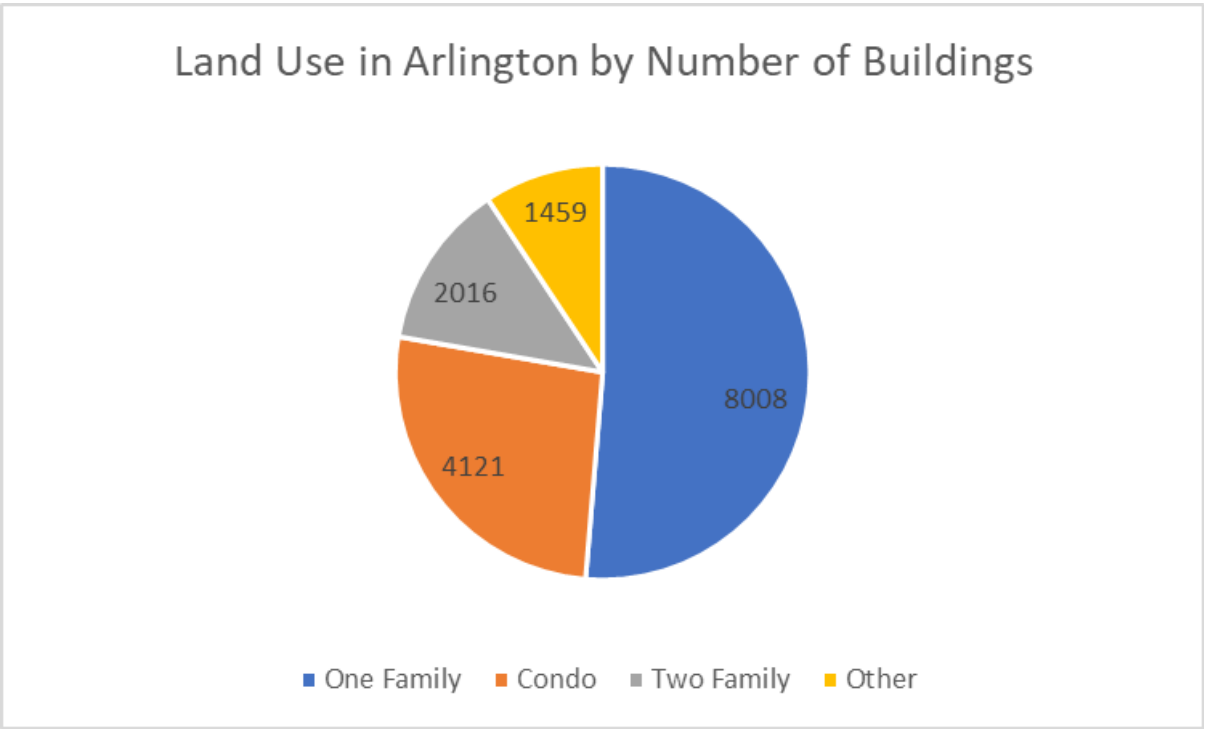
[7] U.S. Department of Energy (2023). LEAD Tool. Retrieved from: https://www.energy.gov/scep/slsc/lead-tool

[8] UMass Donahue Institute (2018). UMDI-DOT Vintage 2022 Population Projections. Retrieved from https://donahue.umass.edu/business-groups/economic-public-policy-research/massachusetts-population-estimates-program/population-projections

[9] MassGIS. MA EJ 2020 Municipal Statistics. Retrieved from https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations



Land use in Arlington is dominated by single-family housing.[10] These private residences make up the majority of land use in town, with condos and two-family buildings in second and third place, respectively. All other uses amount to less than 10% of buildings. Among other uses, notable categories include three-family buildings (174), 9+ unit apartment buildings (68), 4-8 unit apartment buildings (66), and affordable housing properties (36) for residential uses. Offices (44), multi-use (24), auto repair (22), storage (21), banks (15), and service stations (12) are among commercial uses.



[10] Town of Arlington GIS (2023). Assessor Database. Retrieved from https://gis-arlingtonma.opendata.arcgis.com/datasets/6978e3d7c38a41709b3087caf2d49702_0/explore

Arlington's Zoning Bylaws can be found at the link below.
https://www.arlingtonma.gov/town-governance/laws-and-regulations/zoning-bylaws

The Town's official zoning map is at the following link.
https://www.mapsonline.net/arlingtonma/zoning.html

SECTION 3: UTILITY INFORMATION

Electric: Eversource
Covers all of Arlington
The Town's community aggregation plan, Arlington Community Electricity (ACE), offers a carefully designed alternative for the supply portion of the Eversource bill. The Town established ACE, previously known as Arlington Community Choice, in August of 2017, to provide more clean electricity supply options and price stability to Arlington residents and businesses.

Gas: National Grid (Boston Gas)
Covers all of Arlington
Arlington's Select Board, at the suggestion of the Town Manager's volunteer Gas Leaks Task Force, issued a resolution calling for repair of Significant Environmental Impact methane gas leaks in 2023. The resolution requested that National Grid repair 14 large volume gas leaks. National Grid responded that two of the leaks were repaired, six were scheduled for repair by 2024, and the remaining six did not yet have repair dates. The leaks scheduled for repair are unfortunately not in the proposed study area, nor in areas near potential anchor sites for geothermal.

Oil: Arlington Fuel Oil Company, Arlmont Fuel, and others
Servicing Arlington and surrounding communities

Water and sewer: MWRA

3.1 Energy Efficiency

Please see the below and attached Energy Efficiency Database report.

2021 Geographic Report, Arlington, Massachusetts Energy Efficiency Database						
Sector	Annual Electric Usage (MWh)	Annual Electric Savings (MWh)	Electric Incentives	Annual Gas Usage (Therms)	Annual Gas Savings (Therms)	Gas Incentives
Residential & Low-Income	114,951	4,229	$1,155,966	10,685,396	240,602	$1,742,644
Commercial & Industrial	51,633	1,625	$746,858	3,003,693	22,447	$86,685

Total	**166,584**	**5,854**	**$1,902,824**	**13,689,089**	**263,049**	**$1,829,329**
Source: Mass Save (2023). Massachusetts Energy Efficiency Database.						

SECTION 4: STAKEHOLDER ENGAGEMENT AND KNOWLEDGE

4.1 Municipal Stakeholder Engagement

The Department of Planning & Community Development engages a wide range of stakeholders through a variety of approaches across its portfolio of environmental programs and policies.

- Elderly residents, through the Council on Aging and other partners serving Arlington's aging population
- Volunteers at and recipients of resources via food rescue and distribution organizations (FoodLink and Arlington EATS)
- Youth and parents (via schools / Arlington Public Schools Green Teams)
- Residents of affordable housing developments (Arlington Housing Authority, Housing Corporation of Arlington, and others)
- Recreation and after-school organizations (Boys & Girls Club)
- Asian community members (through organizations such as Enhance Asian Community on Health Inc.)
- Veterans (via VFW and the Town's Veterans' Services Division)
- Artists and arts organizations (via the Arlington Commission for Arts and Culture)

The Town gathers community input in a variety of ways. Opportunities for feedback are often designed in the context of a project or initiative, to ensure that partners have a say in their design. They have included:

- Facilitating feedback sessions at partner groups' meetings and events
- Tabling at community-wide events (Farmers' Market, Town Day, Heights Festival)
- Organizing project-specific charrettes/open houses (virtual and in-person)
- Project-specific surveys
- Focus groups
- Community advisory councils and technical advisory groups

Information is shared through the following means:

- Town website (800,000 visitors) and Town Notices (email list of over 6,000 subscribers)
- Town's Facebook and Twitter accounts: facebook.com/arlingtonma and twitter.com/arlingtonmagov. The Facebook account has over 3,600 followers and the Twitter account has over 4,200 followers.
- Arlington Community Media (ACMi, public broadcasting network) channels
- Library (flyering and educational table)
- Organization-specific channels (onsite and via newsletters)
- School principal and superintendent newsletters
- Board & Committee meetings and lists

The following are examples of opportunities that the Town provides to educate stakeholders:

- Forums and educational sessions organized with partners
- Classes through Arlington Community Education
- FAQ documents and reports on specific policies and projects
- Visits to student and other community group meetings
- ACMi interviews and updates (short videos provided by Department heads)

4.2 Networked Geothermal Stakeholder Engagement and Education

The Town has done some engagement around networked geothermal, in the context of education around the path to net zero greenhouse gas (GHG) emissions and gas leaks. For example, in fall 2022, the Electrify Arlington campaign (electrification campaign led by DPCD and the Town's Clean Energy Future Committee, or CEFC) co-sponsored an event with the Arlington Public Library and the Massachusetts Clean Energy Center called Reaching Net Zero with a Clean and Resilient Electric Grid, which discussed networked geothermal in the context of microgrids. The Town's Gas Leaks Task Force, established to address gas leaks from the natural gas grid in light of their contributions to emissions, regularly discusses networked geothermal as an option for phasing out gas piping. The Task Force recently led a "Gas Leaks Safari" in which local and state officials and residents toured gas leak sites to learn about the challenges and potential solutions to the problem, such as networked geothermal, which the Task Force has discussed with interested residents. Residents who have been exposed to methane gas leaks, sometimes over a period of decades, express keen interest in moving their neighborhood off of gas. DPCD staff and Electrify Arlington volunteers have also had conversations with leadership in the Arlington Housing Authority, Housing Corporation of Arlington, Arlington Public Schools, the Arlington Recreation Department, and the Arlington Boys & Girls Club about the possibility of using these entities' properties as anchor sites for networked geothermal.

Going forward, DPCD, along with the partners mentioned above, will engage in a broader campaign to educate stakeholders about networked geothermal and the opportunities it presents to ensure the simultaneous phase-out of leaking gas lines, pursuit of our net zero GHG goals, and efficient and cost-effective heating/cooling. This would include:

- Educational events on networked geothermal for the wider community (via an Arlington Community Education class or Library event);
- Door-to-door canvassing followed by a neighborhood meeting in the locations where the project might affect residents;
- A presentation/facilitated discussion session at a tenants' organization meeting in Menotomy Manor, and a meeting with the students' Green Team at the Thompson Elementary School, two of the potential anchor sites for the network;
- Informational signage at the site of the potential borehole to inform youth recreational leagues and other users of the field about the potential plans for the site and their temporary impact to use of the field and play areas; and
- Educational information on broader Town channels, such as ACMi, the Town website, and social media accounts, to get the word out about events and provide resources on the approaches, technologies, and partners involved in the geothermal study.

When the project is completed, every child (and their family) in East Arlington will have a concrete proof point from their daily life that heating electrification **works**. Much like the early efforts to "seed" rooftop solar led to a sector large enough to justify shuttering the Mystic Generating Station, this project will build further momentum and a constituency for accelerating the thermal networks.

4.3 Environmental Justice Community Engagement

Arlington is the recipient of a Municipal Vulnerability Preparedness 2.0 pilot grant. The purpose of the funding and project is to build connections with environmental justice (EJ) populations, and to let those relationships inform climate planning. The process will inform Town staff about stakeholders in EJ communities, the specific needs of those communities, and ways to address those needs. Specifically, MVP 2.0 will identify and convene a community team to lead equitable climate resilience work, train that team, and set priorities for such work in the future, including by piloting a replicable process. This work is underway now and will bear on the feasibility study at hand.

MVP 2.0 builds on longstanding efforts by the Town to incorporate EJ concerns into climate planning and other efforts. Through its Diversity, Equity, and Inclusion Division, the Town employs a Community Outreach Specialist who can assist with enhanced outreach to EJ populations as part of this project. She has worked over the past several years to build relationships with stakeholders around town.

Specific to this geothermal study, and informed by the MVP 2.0 process, the project team would ensure that outreach opportunities were communicated and accessible to EJ populations within the study area. This would mean creating opportunities for education and feedback in locations and via channels already frequented by members of these priority populations. This could include events at Menotomy Manor or other rental and affordable housing locations implicated by the study, organized in partnership with tenants.

4.4 Stakeholders

The Arlington Housing Authority (AHA) is the principal stakeholder in this effort. Our proposal focuses on their Menotomy Manor property, which is already undergoing a deep energy retrofit. The study that prompted the retrofit specifically references ground source heat pumps as an efficient and viable, if initially capital intensive, option for the site's heating and cooling. The site and partner selection was purposeful; the timing of the retrofit and the focus on a priority population—as well as the size, ownership structure and willingness, and building typology—make working with AHA a perfect fit.

The Housing Corporation of Arlington (HCA) is another affordable housing provider in town, and leadership there is engaged in energy efficiency retrofits and improvements, as well as other climate resilience efforts. Given the overlap in their work, the Town approached both entities simultaneously and found both to be supportive. While not yet directly proposed to be part of the networked geothermal, HCA has properties in the same neighborhood as Menotomy Manor, and can benefit from scaling up the network. It was also important to

bring HCA into the conversation early for the sake of potentially replicating the model we develop through the feasibility study at their larger properties down the line.

The Arlington Recreation Department and recreational users (including students) of the field adjacent to the Thompson Elementary School are important stakeholders, as use of the field and adjacent playground may be temporarily affected. Additional important stakeholders include the Arlington Public Schools leadership, parents, residents of nearby homes, business owners (there are several daycares and a contracting company in the neighborhood), and Town departments such as Facilities and the Department of Public Works.

SECTION 5: IDENTIFY GEOTHERMAL SITE(S)

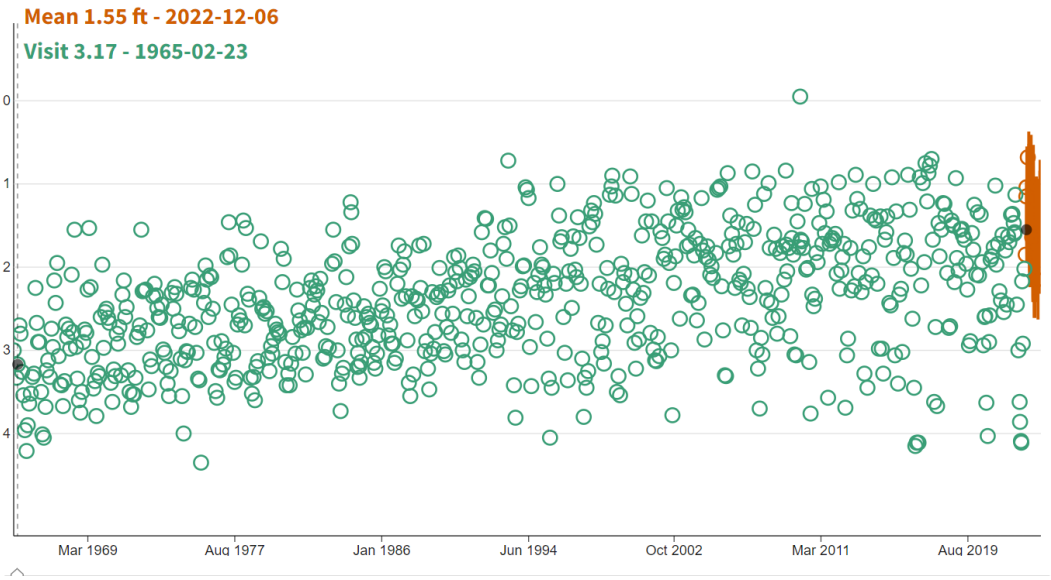
We propose to anchor the pilot network between Thompson Elementary School and Menotomy Manor in East Arlington.

5.1 Site geology and hydrology

This area is generally described as unconfined surface outwash filling older, ancient drainage valleys. Bedrock ranges from surface-exposure near the intersection of Mass Ave and the Alewife Brook, sloping to maximum depth under the Mystic River. Because this is unconfined, annual precipitation leads to a high water table with saturated soil to bedrock. The site is near the Alewife Brook and Mystic River, but is > 200 feet from either, minimizing permitting and wetland protection concerns.

The field at Thompson Elementary, owned and managed by Arlington Recreation, will be the main bore field for this network due to its available space and closeness to both the school and Menotomy Manor. The USDA's soil map shows this field as being a loamy glacial/marine deposit with > 80 inches depth to bedrock. Surrounding developed parcels that will carry the network are fine sandy loam to 2', then stratified gravel to gravelly sand to 5'. From there, the baseline loamy glacial/marine deposit resumes until bedrock is reached. These wet, low-clay soils have excellent thermal conductivity and specific heat capacity, ensuring that lateral runs will not thermally interact with the surface.

The nearest USGS monitoring well is in Lexington. It shows groundwater at a depth of 1-3 feet below the surface:

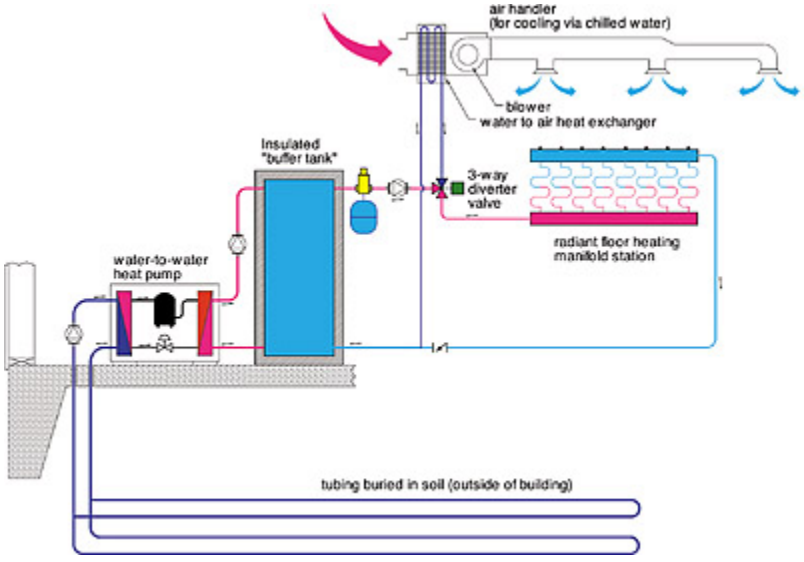


The state's database of well drilling results in Arlington shows that bedrock depth ranges from 5-44 feet, with water levels from 5-18 feet in depth. The bedrock beneath this area is largely shale.

In conclusion, this area has wet and well-structured soil that encourages heat transfer atop a shallow and easily-accessible bedrock layer.

5.2 Building types and existing systems

Thompson Elementary has two primary heating systems, and no air conditioning. The heating systems are 2 x 1.44 MBtu/hr gas-fired boilers, which feed hydronic distribution to local air handlers and baseboard radiators. The school's heating load is 240 tons. As the climate warms, the school has had to cancel classes increasingly frequently in September due to its lack of cooling.



Illustrative example of Thompson Elementary's thermal system after networked geothermal retrofit

Menotomy Manor has 179 units, whose heating system sizes vary. Using a 2 ton per unit heating load for estimation produces a system heating load of 358 tons. Air conditioning is provided by resident-purchased window units.

Together, this creates a network load of **598 tons** for heating. The school's occupancy pattern will complement the standard residential morning-evening heating peak, leading to a flatter load profile for the combined properties than either would achieve on their own. While the school's summer activities will make use of air conditioning, it is at a much lower utilization than during the school year, leaving ample heat-absorbing capacity in the network for the residences.

A significant opportunity for heat recovery exists at the school's splash pad. Active during the summer, water drains into a sewer main in a once-through pattern for sanitary reasons. This could represent a major heat sink for absorbing cooling load. Additionally, the buried sewer main leaving the school that this joins is likely a consistent source of thermal energy in the heating season that could augment the geothermal field.

This area is well suited for future network growth, with several other single owner multi-unit complexes nearby. The gridded street and gas main layout will allow for block-by-block expansion into the single-family properties as the networked geothermal model accelerates. The even distribution of Town buildings, parks, and fields can seed new anchors that grow toward each other. Spy Pond's central location offers tremendous benefit for a closed-loop water source segment of the network, especially considering the energy-intensive and oil-burning Boys and Girls Club on its banks.

5.3 Test borehole

To prove the assumptions and collect data, we propose to dig a single test borehole on the grounds of the school and park. This will validate modeling assumptions and allow full-scale designs to be refined.

This is also an opportunity to engage the community. Once the test is complete, the borehole would need to be capped while waiting for the project to begin. The Town could add protective barriers like circular picnic tables, while placing signage explaining the project. With hundreds of residents passing through the school grounds each day, the message and potential of networked geothermal will quickly turn into a focus of anticipation for the neighborhood.

Appendix: Budget

Town of Arlington		
PROJECTED INCOME		
Funding Sources	**Amount**	**Funds Requested or Committed?**
Kickstart Grant	$50,000	Requested
In-kind match	$8,500	Committed
	$	
	$	
	$	
	$	
Total Income	$50,000	
PROJECTED EXPENSES		
Expense	**Amount**	**Billed to Kickstart Grant? (Y/N)**
Consultant fee	$23,000	
Partner stipend	$4,000	
Outreach and events	$3,000	
Drilling and testing	$10,000	
Municipal staffing (project and grant management)	$8,500	No, in kind match
	$58,500	
Total Expenses	$58,500	

Arlington HOUSING AUTHORITY MASSACHUSETTS
AHA
www.arlingtonhousing.org
4 Winslow Street, Arlington, MA 02474 p: 781-646-3400 f: 781-646-0496

HCA
Housing Corporation of Arlington

October 30, 2023

To Whom It May Concern:

The Arlington Housing Authority (AHA) and Housing Corporation of Arlington (HCA), the town's two largest affordable housing providers, strongly support the Town of Arlington's application to the HEET Kickstart Massachusetts Grant for a networked geothermal feasibility study.

AHA and HCA are working to preserve and maintain affordable housing stock that is resilient, efficient, healthy, and safe. To that end, both AHA and HCA are working to incorporate climate mitigation and resiliency initiatives into capital improvements, including by implementing deep energy retrofits and shifting to all-electric buildings. However, electrification can yield expensive bills for tenants, particularly where cooling is added. The prospect of a networked geothermal system that is even more efficient than other electric heating/cooling systems is very exciting. Without external funding, however, a feasibility study for geothermal would not otherwise be possible financially for both organizations.

AHA's Menotomy Manor could be a prime anchor site for networked geothermal, as well as help to balance energy needs with the nearby Thompson Elementary School. The property consists of a total of 179 family housing units on two adjacent sites—the largest site in AHA's portfolio—with ample lawn space. The study informing an ongoing energy retrofit of Menotomy Manor determined that ground source heat pumps would be an efficient source of cooling and heating that would simultaneously ensure greenhouse gas reduction and keep energy costs low if capital could be secured. Importantly, Menotomy Manor provides housing to one of the most racially and socio-economically diverse populations in Arlington. About half of the units are home to at least one person of color, and the average household income is $33,123.

HCA owns small multifamily properties near the proposed study site. These residences would also benefit from efficient, all electric heating and cooling systems. HCA is planning for building electrification in an upcoming capital needs assessment. HCA's portfolio consists of many properties across Arlington; networked geothermal is the most desirable way of connecting them. This feasibility study would be useful for HCA's planning purposes and could set an important precedent for other affordable housing providers around the state, as they consider options for building electrification.

For these reasons, the East Arlington networked geothermal feasibility study is an exciting opportunity to support the preservation—and decarbonization—of affordable housing in Arlington and around the Commonwealth. Thank you for your consideration of this project.

Sincerely,

Jack Nagle
Executive Director
Arlington Housing Authority

Erica Schwarz
Executive Director
Housing Corporation of Arlington

2021 Geographic Report

County	Town	Zip Code	Sector	Annual Electric Usage (MWh)	Annual Electric Savings (MWh)	Electric Incentives	Annual Gas Usage (Therms)	Annual Gas Savings (Therms)	Gas Incentives
Middlesex	Arlington	All Zips	Residential & Low-Income	114,951	4,229	$ 1,155,966	10,685,396	240,602	$ 1,742,644
Middlesex	Arlington	All Zips	Commercial & Industrial	51,633	1,625	$ 746,858	3,003,693	22,447	$ 86,685
Middlesex	Arlington	All Zips	Total	166,584	5,854	$ 1,902,824	13,689,089	263,049	$ 1,829,329

Notes:

1. These data represent a limited time period and are not representative of total historic program distribution, or total program effort in any geographic area, and therefore are not to be used to project future program needs in any geographic area.

2. This data is sourced from residential and C&I customer profile studies (available here), which use gross savings and incentives data collected from a combination of PA customer tracking and other vendor data (such as upstream lighting sales by store location) to geographically represent savings and spending across the Commonwealth. The study data does not always tie directly to the PA customer tracking systems and DPU reported savings, which take into account other factors, such as evaluation impact factors and attribution.

3. Since actual purchasers of bulbs through the residential upstream lighting core initiative are not known a model was used to allocate savings and incentives to the census block group level. Behavioral savings were modeled at the block group level by assuming average monthly savings were attributed to participating households in each block group. The C&I data includes all upstream lighting installs and savings that could be geocoded.

4. C&I data only available at the ZIP Code level for Boston.

5. Municipalities may access municipal energy use and cost data for municipal buildings through MassEnergyInsight, a no cost tool provided to Massachusetts communities by the Massachusetts Department of Energy Resources (DOER) as part of the Massachusetts Green Communities Program.

6. Revised September 2020.

No gas = No gas service available.
Municipal = This town is served by a municipal [electric/gas] utility.
Protected = In order to protect customer privacy, some data has been aggregated. Residential & Low-Income data is displayed only when there is a minimum of 100 premises; Commercial & Industrial data is displayed only when there is a minimum of 15 accounts.

TOWN OF ARLINGTON
MASSACHUSETTS

DEPARTMENT OF PLANNING AND
COMMUNITY DEVELOPMENT

HEET
50 Milk St. 16th Floor
Boston, MA 02109

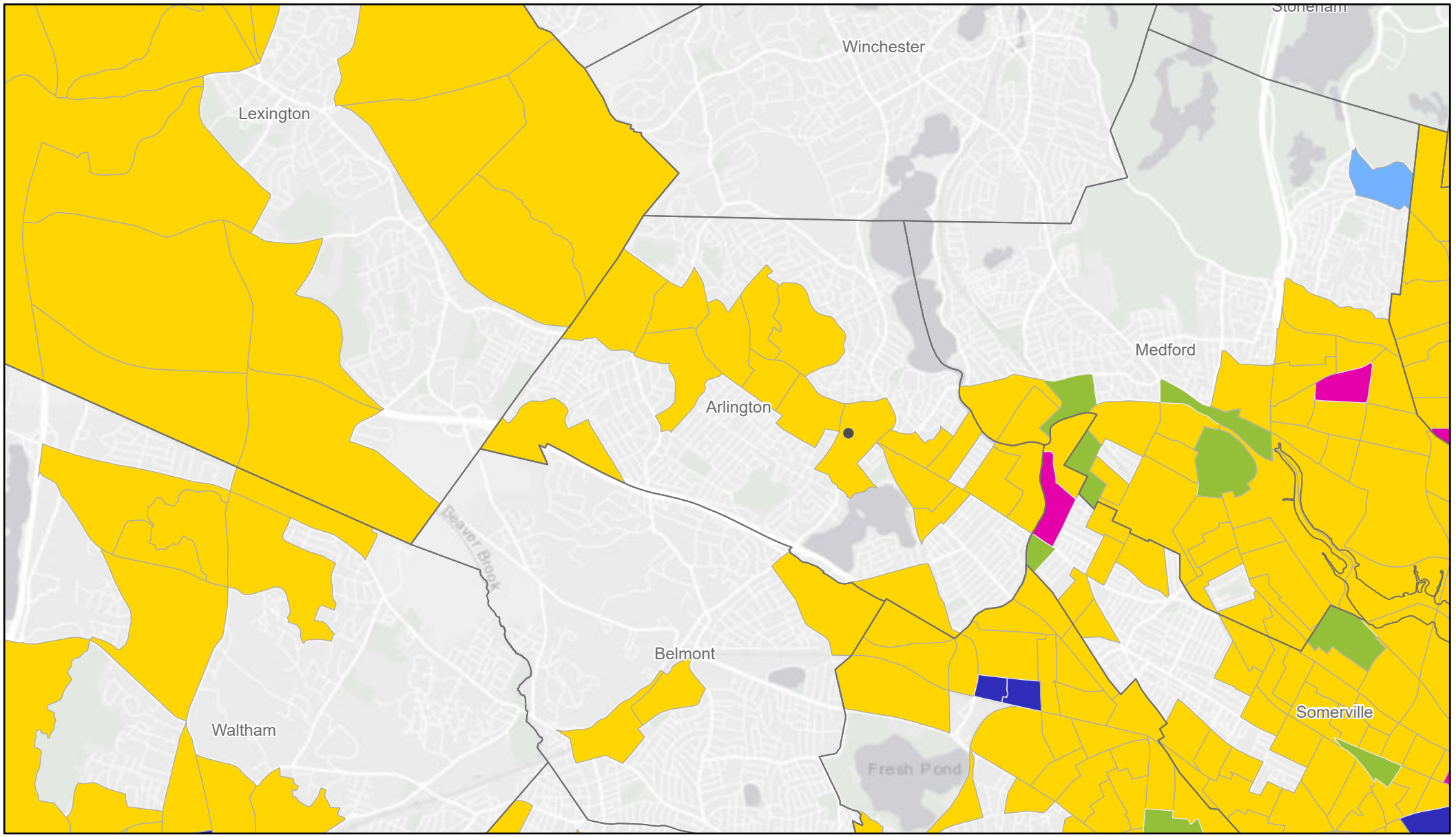
Re: Kickstart Mass RFA Staff Verification

Talia Fox and David Morgan are full-time staff with the Town of Arlington's Department of Planning and Community Development. Both are credentialed experts with the titles of Sustainability Manager and Environmental Planner, respectively. Please accept this memo as proof of their affiliation.

Sincerely,

Claire Ricker
Director
Department of Planning and Community Development

2020 Environmental Justice Neighborhoods



10/16/2023, 12:03:24 PM

1:72,224

0 0.45 0.9 1.8 mi

0 0.75 1.5 3 km

MassGIS, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA

MassGIS, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA | EEA GIS |

Please note that new Connecticut county and township level geographies are not available within the map.

An official website of the United States government

United States Census Bureau

QuickFacts

Arlington town, Middlesex County, Massachusetts

QuickFacts provides statistics for all states and counties, and for cities and towns with a ***population of 5,000 or more***.

Table

All Topics	Arlington town, Middlesex County, Massachusetts
Population Estimates, July 1, 2022, (V2022)	**45,522**
PEOPLE	
Population	
Population Estimates, July 1, 2022, (V2022)	**45,522**
Population estimates base, April 1, 2020, (V2022)	46,315
Population, percent change - April 1, 2020 (estimates base) to July 1, 2022, (V2022)	-1.7%
Population, Census, April 1, 2020	46,308
Population, Census, April 1, 2010	42,844
Age and Sex	
Persons under 5 years, percent	6.5%
Persons under 18 years, percent	21.4%
Persons 65 years and over, percent	16.0%
Female persons, percent	53.3%
Race and Hispanic Origin	
White alone, percent	75.6%
Black or African American alone, percent (a)	3.3%
American Indian and Alaska Native alone, percent (a)	0.1%
Asian alone, percent (a)	13.7%
Native Hawaiian and Other Pacific Islander alone, percent (a)	0.0%
Two or More Races, percent	6.1%
Hispanic or Latino, percent (b)	5.0%
White alone, not Hispanic or Latino, percent	72.9%
Population Characteristics	
Veterans, 2017-2021	1,001
Foreign born persons, percent, 2017-2021	19.2%
Housing	
Housing units, July 1, 2022, (V2022)	X
Owner-occupied housing unit rate, 2017-2021	59.6%
Median value of owner-occupied housing units, 2017-2021	$733,700
Median selected monthly owner costs -with a mortgage, 2017-2021	$3,143
Median selected monthly owner costs -without a mortgage, 2017-2021	$1,083
Median gross rent, 2017-2021	$1,797
Building permits, 2022	X
Families & Living Arrangements	
Households, 2017-2021	19,308
Persons per household, 2017-2021	2.37
Living in same house 1 year ago, percent of persons age 1 year+, 2017-2021	86.7%
Language other than English spoken at home, percent of persons age 5 years+, 2017-2021	21.6%
Computer and Internet Use	
Households with a computer, percent, 2017-2021	96.4%
Households with a broadband Internet subscription, percent, 2017-2021	94.6%
Education	
High school graduate or higher, percent of persons age 25 years+, 2017-2021	97.3%
Bachelor's degree or higher, percent of persons age 25 years+, 2017-2021	74.2%
Health	
With a disability, under age 65 years, percent, 2017-2021	4.5%
Persons without health insurance, under age 65 years, percent	1.4%

Economy	
In civilian labor force, total, percent of population age 16 years+, 2017-2021	73.2%
In civilian labor force, female, percent of population age 16 years+, 2017-2021	71.2%
Total accommodation and food services sales, 2017 ($1,000) (c)	80,552
Total health care and social assistance receipts/revenue, 2017 ($1,000) (c)	146,119
Total transportation and warehousing receipts/revenue, 2017 ($1,000) (c)	D
Total retail sales, 2017 ($1,000) (c)	275,253
Total retail sales per capita, 2017 (c)	$6,059
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2017-2021	33.4
Income & Poverty	
Median household income (in 2021 dollars), 2017-2021	$125,701
Per capita income in past 12 months (in 2021 dollars), 2017-2021	$69,007
Persons in poverty, percent	⚠ 4.6%

BUSINESSES

Businesses	
Total employer establishments, 2021	X
Total employment, 2021	X
Total annual payroll, 2021 ($1,000)	X
Total employment, percent change, 2020-2021	X
Total nonemployer establishments, 2020	X
All employer firms, Reference year 2017	812
Men-owned employer firms, Reference year 2017	443
Women-owned employer firms, Reference year 2017	191
Minority-owned employer firms, Reference year 2017	109
Nonminority-owned employer firms, Reference year 2017	572
Veteran-owned employer firms, Reference year 2017	S
Nonveteran-owned employer firms, Reference year 2017	684

GEOGRAPHY

Geography	
Population per square mile, 2020	9,004.1
Population per square mile, 2010	8,325.7
Land area in square miles, 2020	5.14
Land area in square miles, 2010	5.15
FIPS Code	2501701605

About datasets used in this table

Value Notes

⚠ Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable.] Click the Quick Info ⓘ icon to the left of each row in T. learn about sampling error.

In Vintage 2022, as a result of the formal request from the state, Connecticut transitioned from eight counties to nine planning regions. For more details, please see the Vintage 2022 release notes available here: Release Notes.

The vintage year (e.g., V2022) refers to the final year of the series (2020 thru 2022). Different vintage years of estimates are not comparable.

Users should exercise caution when comparing 2017-2021 ACS 5-year estimates to other ACS estimates. For more information, please visit the 2021 5-year ACS Comparison Guidance page.

Fact Notes

(a)	Includes persons reporting only one race
(b)	Hispanics may be of any race, so also are included in applicable race categories
(c)	Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

D	Suppressed to avoid disclosure of confidential information
F	Fewer than 25 firms
FN	Footnote on this item in place of data
NA	Not available
S	Suppressed; does not meet publication standards
X	Not applicable
Z	Value greater than zero but less than half unit of measure shown
-	Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest or upper interval of an open ende
N	Data for this geographic area cannot be displayed because the number of sample cases is too small.

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, Sta Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.