|  | Massachusetts Department of Environmental Protection Bureau of Resource Protection – Drinking Water ProgramWater Supply Facility Checklist for GAC Media Equivalency Request Review/Approval |
| --- | --- |
|  | Instructions to Applicant  |
| **Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key. |  The purpose of this Drinking Water Program (DWP) Facility Checklist is to assist the public water systems to prepare drinking water program applications that comply with current MassDEP regulations, policies, and guidelines. Completion of this checklist will ensure that the applicant has considered all minimum aspects identified by the MassDEP Drinking Water Program. MassDEP may require additional information as regulations, standards, or procedures are implemented or revised.  A Massachusetts Registered Professional Engineer must complete the appropriate section(s) of the checklist for the Equivalency requested (including any brief explanations), sign the certification statement, and submit this checklist, brief explanations (where noted), and certification with the application (BRP WS 21 permit application). The DWP staff will use these documents to expedite the review/approval of the application.  **If more than one media for equivalency request is proposed, a separate checklist will be required.** N/A means “not applicable.”  MassDEP Guidelines & Policies for Public Water Systems: <https://www.mass.gov/info-details/guidelines-for-public-water-systems>  MassDEP Drinking Water Regulations 310 CMR 22.00:  <https://www.mass.gov/regulations/310-CMR-22-the-massachusetts-drinking-water-regulations>   |
|  |
|  | A. Facility Information |
|  |       PWS Name |
|  |       City/Town |       PWS ID # |       Source(s) Code # |
|  |       Treatment Facility  |       Permit Application # |
|  |   |       MassDEP Transmittal # |
|  |  Check construction status: [ ]  New Construction [ ]  Replacement or Upgrade Construction  |
|  | B. Project Checklist |
|  | 1. **Project description:** |
|  | 1. What are the reasons for requesting the GAC Media Equivalency? Your reasoning should include the product that was previously approved for use by MassDEP at the water treatment plant as well as the product you are proposing to substitute.
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|  | 1. Why is a pilot study not feasible?

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|  |        |
|  | 1. Why do you believe the proposed media is equivalent to the approved media? Provide the conclusions of the self-assessment, including the rationale for why the proposed product is considered equivalent to the approved media.
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|  |       |
|  | **2. Product evaluation** |
|  | Answer the following questions regarding the proposed product. |
|  |  | **Yes** | **No** | **N/A** |
|  | 1. Has the product been reviewed and approved by a third party? If Yes, select which party approved the product below. | [ ]  | [ ]  | [ ]  |
|  | NSF | ETV | UL | AWWA |  |  |  |
|  | [ ]  | [ ]  | [ ]  | [ ]  | **Yes** | **No** | **N/A** |
|  | 2. Has the GAC media been approved Statewide in Massachusetts by MassDEP/DWP (listed on the [New Technology approval list](https://www.mass.gov/doc/list-of-massdep-approved-new-drinking-water-technologies/download))? | [ ]  | [ ]  | [ ]  |
|  | NOTE: If the media has not been approved by a third party or /and by MassDEP/DWP statewide, then the applicant must submit a New Technology Approval permit application. |
|  | **Media compatibility** | **Yes** | **No** | **N/A** |
|  | 3. Does the proposed media have equivalent chemical and physical properties to the previously approved media? If yes, for GAC use Table 1 below to provide technical details demonstrating that the medias are equivalent. Table 1 outlines the minimum parameters required to compare both medias. (Please attach supporting documentation from the manufacturer).  | [ ]  | [ ]  | [ ]  |
|  | **Table 1**

|  |  |  |
| --- | --- | --- |
| Physical and chemical parameters | Currently Approved product parameters | Proposed product parameters |
| Media Name |  |  |
| Name of production company |  |  |
| Production Process Type |  |  |
| Product Source  |  |  |
| Starting Material (Wood/Coconut/Bituminous Coal/Lignite-Low Density Coals) |  |  |
| Adsorption Capacity (Iodine Number) |  |  |
| U.S. Standard Mesh Size |  |  |
| Particle size distribution |  |  |
| Effective size |  |  |
| Apparent Density  |  |  |
| Abrasion Number |  |  |
| Uniformity coefficient |  |  |
| Moisture content |  |  |
| Media Pre- Treatment  |  |  |

 |
|  | **Media Performance** | **Yes** | **No** | **N/A** |
|  | 1. Has the proponent conducted Rapid Small-Scale Column Tests (RSSCT) of the original media and the proposed product(s).
 | [ ]  | [ ]  | [ ]  |
|  | 1. If Yes to question 4 above, use Tables 2, 3 and 4, to provide the operational conditions and results for the RSSCT test. These tables outline the minimum required parameters. Please note: All additional relevant documentation must also be included in the RSSCT report.
 |
|  | 1. **Table 2** summary of operational conditions for RSSCT test and the Full-Scale System

|  |  |  |
| --- | --- | --- |
| **Parameter** | **RSSCT** | **Full Scale System** |
| GAC, Mesh Size |  |  |
| Adsorber Diameter |  |  |
| Water Flow Rate |  |  |
| Hydraulic Loading |  |  |
| EBCT |  |  |

 |
|  | 1. **Table 3:** Summary of RSSCT Results and media Usage Rate Predictions

**RSSCT Test Results-** **Contaminant Control to Initial Breakthrough**

|  |  |  |
| --- | --- | --- |
| Contaminant | Currently approved - In use - Media | Proposed Media |
| Column Diameter, cm |   |   |
| Column Length, cm |   |   |
| GAC Type |   |   |
| Carbon Particle Size, mesh |   |   |
| GAC Density, g/cc |   |   |
| Water Temperature, oC (+/- 1 oC) |   |   |
| Water Pump Rate, cc/min |   |   |
| Breakthrough Time, hours |   |   |
| GAC Volume, cc |   |   |
| EBCT, minutes (Actual for Column) |   |   |
| Treated Bed Volumes |   |   |
| Gallons Water Fed toBreakthrough |   |   |
| Carbon Mass, lbs |   |   |
| Specific Throughput, gal/lb Carbon |   |   |
| Carbon Usage Rate, lbs/1000 gal |   |   |
| Inlet Concentration, µg/L |   |   |
| Simulated EBCT, Minutes |   |   |
| Water Treatment Rate, gpm |   |   |
| Daily GAC Usage Rate, lbs/day |   |   |

 |
|  | 1. **Table 4:** Water quality parameters before and after the RSSCT test.

|  |  |  |
| --- | --- | --- |
|  | Currently Approved- In use Media | Proposed Media |
| *Before the test*  | *After the test* | *Before the test*  | *After the test* |
| Water Temperature, oC (+/- 1 oC) |  |  |  |  |
| pH (field measurement)  |  |  |  |  |
| Turbidity (NTU)  |  |  |   |   |
| Color (color units) |  |  |  |  |
| Total Hardness (mg/L as CaCO3 ) |  |  |   |   |
| Alkalinity (mg/L as CaCO3 ) |  |  |   |   |
| Total Suspended Solids (mg/L) |  |  |   |   |
| Total Organic Carbon (TOC)mg/L |  |  |   |   |
| Dissolved Organic Carbon (DOC, mg/L) |  |  |   |   |
| Nitrate (milligram per liter; mg/L) |  |  |   |   |
| Nitrite (mg/L) |  |  |   |   |
| Phosphate (mg/L) |  |  |  |  |
| Sulfate (mg/L) |  |  |  |  |
| Bicarbonate (mg/L) |  |  |   |   |
| Iron (mg/L)  |  |  |  |  |
| Manganese (mg/L) |  |  |  |  |
| Inlet PFAS6 Concentration, µg/L |  |  |  |  |
| Arsenic (mg/l) |  |  |  |  |

 |
|  |  | **Yes** | **No** | **N/A** |
|  | 1. Upon reviewing the treatment breakthrough graphs for current and proposed media, do the results show a similar breakthrough point?
 | [ ]  | [ ]  | [ ]  |
|  | 1. Provide a detailed conclusion of the RSSCT test, demonstrating that the proposed media exhibit comparable performance to the current media in removing the contaminant(s). Be sure to include supporting data and analysis to substantiate this claim.
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|  | **Historical uses of the Proposed Media (If known)** | **Yes** | **No** | **N/A** |
|  | 6. Has the media been used at **any other** water treatment plants with similar environmental conditions in accordance with 310 CMR 22.04(8) (c) for removal of the same contaminant(s)? | [ ]  | [ ]  | [ ]  |
|  | 1. If yes, provide information in table 5
 |
|  | **Table 5**

|  |  |  |
| --- | --- | --- |
|  | For the WTP using the proposed product | For the WTP where the PWS wants to use the product  |
| WTP Name, ID and address |   |   |
| Source water type (surface/ground) |   |   |
| Number of sources |  |  |
| Description of the Pretreatment processes and contaminant remove |  |   |
| GAC Vessel Arrangement |  |  |
| Water Treatment Plant Flow Rate (gpm) |   |   |
| GAC Volume (ft3) |   |   |
| GAC filter Surface loading rate (gpm/ft2) |  |  |
| EBCT (Actual for Column) (min) |  |  |
| Gallons Water Fed to Breakthrough (gal) |  |  |
| Breakthrough Time (hours) |  |  |
| Treated Bed Volumes |  |  |
| *Water quality parameters just before going to the GAC filter* |
| Water Temperature, ºC (+/- 1 ºC) |  |  |
| pH  |  |  |
| Iron (mg/L)  |   |   |
| Manganese (mg/L) |   |   |
| Turbidity (NTU)  |   |   |
| Color (color units) |  |  |
| Total Hardness (mg/L as CaCO3) |   |   |
| Alkalinity (mg/L as CaCO3) |   |   |
| Total Suspended Solids (mg/L) |   |   |
| Total Organic Carbon (TOC) (mg/L) |   |   |
| Dissolved Organic Carbon (DOC) (mg/L) |   |   |
| Nitrate (mg/L) |   |   |
| Nitrite (mg/L) |   |   |
| Phosphate (mg/L) |  |  |
| Sulfate (mg/L) |  |  |
| Bicarbonate (mg/L) |   |   |
| Inlet PFAS6 Concentration (µg/L) |  |  |
| Arsenic (mg/L) |  |  |

 |
|  | 1. Provide detailed information that can help justify why the media will remove contaminants with the same level of efficacy as it has in the treatment plants where it has been previously used. (Be sure to attach supporting materials.)
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|  |       |
|  | 1. Explain why any differences in water quality between the water treatment plants in Table 2 will not decrease the effectiveness of the product in removing drinking water contaminants
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| --- | --- |
|  | A. Applicant’s Engineer |
|  |  I hereby certify, as a Professional Engineer registered in Massachusetts, that the Drinking Water Facilities Checklist is a true and accurate representation on the information contained in the Equivalency Request submitted within this Checklist application. |
|  |       Signature of Professional Engineer  |       Date |
|  |       Printed Name  |       Title |
|  |       Professional Engineer License number |
|  |       Employer |
|  |       Phone Number      Email Address |
|  | **B. Applicant** |
|  | This checklist and attached permit application are submitted on behalf of water representative:  |
|  |       Date |
|  |       Printed Name |
|  |       Title |
|  |       Employer |
|  |       Phone Number |
|  |       Email Address |
|  |       City/Town |
|  |       Address |
|  |       PWS Name |       PWS ID # |
|  |       Applicant Signature |       Date |