Corrective Action Plan 2
Corrective Action Areas I and II – Operable Unit B
North Bennington and Bennington

Prepared for
Saint-Gobain Performance Plastics

March 2020

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North Bennington and Bennington

March 2020

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Acronyms

Acronym	Description
ANR	Agency of Natural Resources
CAAI	Corrective Action Area I
CAAII	Corrective Action Area II
CAAs	Corrective Action Areas I and II
CAP	Corrective Action Plan (2018)
CAP2	Corrective Action Plan 2 (2019)
CAP2 OUB	Corrective Action Plan for Operable Unit B
CSM	Conceptual Site Model
GAC	Granular Activated Carbon
IROCPR	Investigation and Remediation of Contaminated Properties Rule
LTM	long-term monitoring
MNA	monitor natural attenuation
OM&M	operation, maintenance and monitoring
OUA	Operable Unit A
OUB	Operable Unit B
OUC	Operable Unit C
PFAS	per- and poly-fluoroalkyl substances
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexane sulfonate
PFNA	perfluorononanoic acid
PFOA	perfluorooctanic acid
PFOS	perfluorooctanesulfonic acid
POET	point-of-entry treatment
ppt	parts per trillion
QA/QC	quality assurance and quality control
VTDEC	Vermont Department of Environmental Conservation

1.0 Introduction/Executive Summary

1.1 Purpose

This corrective action plan, prepared by Barr Engineering Co. (Barr) on behalf of Saint-Gobain Performance Plastics (Saint-Gobain), is developed pursuant to the Consent Order and Final Judgment, dated May 28, 2019 (Consent Order). This Consent Order supersedes the Consent Order and Final Judgment, dated October 2, 2017.

The Consent Order defines two corrective action areas: Corrective Action Area I (CAAI) and Corrective Action Area II (CAAII) and, for the purpose of this plan, are collectively referred to as Corrective Action Areas (CAAs). As identified in Appendix B to the Consent Order and shown on Figure 1, CAAI generally consists of a bounded area west of Route 7 and CAAII generally consists of a bounded area east of Route 7. CAAI is divided into two operable units and CAAII is divided into three operable units. Operable Unit A (OUA) in CAAI and CAAII and Operable Unit C (OUC) in CAAII are the subject of separate corrective action plans prepared by the Vermont Agency of Natural Resources (ANR). Operable Unit B (OUB) in CAAI and CAAII are the subject of this corrective action plan (CAP2).

The *Corrective Action Plan, Corrective Action Area I – Operable Unit B, North Bennington and Bennington,* dated May 2018 (CAP), is currently being implemented. CAP2 addresses CAAI and CAAII and prepared based on the requirements in Appendix A of the Consent Order, Section II Corrective Action Area I, paragraph 5 and Section IV Corrective Action Area II – Operable Unit B, paragraph 8, and in accordance with the Consent Order and "Investigation and Remediation of Contaminated Properties Rule (IROCPR)," effective July 6, 2019. CAP2 supersedes the CAP prepared for OUB in CAAI.

1.2 Summary of Site Investigation Work

Investigative work within the Corrective Action Areas has been conducted by multiple parties, including consultants on behalf of Saint-Gobain, the ANR, the U.S. Environmental Protection Agency, colleges, and universities. Investigative work included surficial and bedrock mapping; borehole geophysics; measurements of groundwater elevation; and the collection of drinking water samples from private wells and municipal supplies, groundwater samples from monitoring wells and springs, surface water samples, sediment samples, fish tissue samples, sludge samples, and soil samples.

This investigative work informed development of a Conceptual Site Model (CSM), which, among other things, identified certain potential sources and pathways for per- and poly-fluoroalkyl substances (PFAS), specifically perfluorooctanoic acid (PFOA), found in groundwater. The CSM is described in detail in the *Draft Conceptual Modeling of PFOA Fate and Transport: North Bennington, Vermont*, dated June 2017 (Draft CSM Report). The CSM incorporated the data collected from the site investigative work to evaluate the complete transport pathway from source to sensitive receptor, that is, primarily people drinking the water, which required multiple numerical models to assess fate and transport through air, the unsaturated soil, and groundwater.

A *Conceptual Site Model Site Investigation Report: Bennington, Vermont*, dated March 2018, was prepared for CAAI and the surrounding area to evaluate the distribution of PFAS, in particular PFOA, in soil and groundwater and its consistency with the CSM. Soil and groundwater samples were collected across the area to provide additional information about the depositional environment, groundwater flow, and potential sources and distribution of PFAS impacts.

1.3 Remedial Objectives

The major remedial objective of CAP2 is to provide a long-term remedy in areas where public water is not or will not be provided and private wells may exhibit now or in the future, concentrations of PFAS at or above the regulatory standard established by the Groundwater Protection Rule and Strategy and pursuant to the Consent Order. The current regulatory standard established by the Groundwater Protection Rule and Strategy is 20 parts per trillion (ppt) for the combined concentrations (sum of): PFOA, perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), and perfluorononanoic acid (PFNA).

The Consent Order defines OUB as the area without municipal water line connections and where existing municipal water line connections were present; the OUB areas are shown in Appendix B of the Consent Order. In general, for CAP2, the parcels where existing water lines are present are not covered by this corrective action plan.

1.4 Analysis of Remedial Alternatives

Barr, on behalf of Saint-Gobain, prepared a comparative analysis of corrective actions for CAAI and an evaluation of corrective action alternatives for CAAII. Both reports evaluated potential corrective actions for eliminating drinking water pathways and addressing PFAS concentrations in groundwater. These reports are Appendix C and C1 of the Consent Order.

The remedial options evaluated to eliminate the drinking water pathway included:

- Long-term operation of point-of-entry treatment (POET) systems using granular activated carbon (GAC);
- Extension of the existing municipal water lines;
- Replacement of drinking water wells;
- Monitored natural attenuation;
- Physical barriers, cut-off walls, and reactive barriers;
- In-situ treatment;
- Low permeability capping;
- Excavation of surface soil; and
- POET systems using other treatment technologies.

The comparative analysis of these options was performed using the criteria specified in 40 C.F.R. § 300.430(e)(9)(iii) and the Evaluation of Corrective Action Alternatives was performed consistent with the requirements within Subsection 35-604 in the IROCPR. The criteria included:

- Overall protectiveness to human health and the environment;
- Compliance with applicable, relevant, and appropriate requirements or legal requirements;
- Short-term effectiveness;
- Long-term effectiveness and permanence;
- Reduction of contaminant mass, mobility, and toxicity through treatment;
- Implementability;
- Cost; and
- Community acceptance.

In addition, the evaluation of corrective action alternatives for CAAII also considered environmental impact and sustainability.

1.5 Description of Selected Corrective Actions

As specified in the ANR decision document (Appendix D of the Consent Order), the selected corrective action in CAAI OUA, CAAII OUA, and CAAII OUC requires connecting locations with water supply wells with PFAS concentrations at or above the regulatory standard and other locations with the potential for PFAS concentrations to be at or above the regulatory standard, to municipal water lines where technically feasible and cost-effective. A separate *Interim Measures Corrective Action Plan for Public Water System (PWS) Extensions, Corrective Action Area I, Operable Unit A*, developed by ANR, dated August 11, 2017, addresses the area where water lines were extended within CAAI. A separate *Interim Measures Corrective Action Plan for Public Water System (PWS) Extensions, Corrective Action Area II, Operable Unit A*, developed by ANR, dated June 7, 2019, addresses the area where water lines will be extended within CAAII. It is anticipated that a similar Corrective Action Plan will be developed by ANR for OUC.

This corrective action plan for OUB (CAP2 OUB) addresses the remedial alternative selected for areas where it was determined not to be technically feasible or cost-effective to extend municipal water lines. The remedial alternatives selected for CAAs OUB include, in part, long-term operation of POETs or replacement of drinking water wells in select locations.

This CAP2 OUB is a series of individual Plans that address those properties for which connection to the municipal water lines is not technically feasible or cost-effective. These Plans include:

- **Well Replacement Plan (Attachment A)** – addresses potential private water well replacement and associated activities at properties at which PFAS concentrations are at or above the regulatory standard.

- **New Well Testing Plan (Attachment B)** – addresses sampling requirements at properties with newly proposed and installed private water wells.
- **Bottled Water Plan (Attachment C)** – addresses interim actions (i.e., supplying bottled water) upon identification of PFAS concentrations at or above the regulatory standard in replacement wells or any wells in the long-term monitoring plan.
- **POET OM&M Manual (Attachment D)** – addresses POET Operation, Maintenance, and Monitoring (OM&M) requirements at properties with POET systems.
- **Long-Term Monitoring Plan (Attachment E)** – addresses the Long-Term Monitoring (LTM) sampling requirements for drinking-water wells without POET systems.
- **Long-Term MNA Plan (Attachment F)** – presents a long-term plan to monitor natural attenuation (MNA) of soil and groundwater until the associated soil and groundwater performance standards are met; and
- **Institutional Control Plan (Attachment G)** – presents a plan for institutional controls associated with CAAs OUB.

The relationship between these Plans is shown on Figure 2.

If as part of CAP2, a private water well is being replaced with a new well or eliminated if the location is being connected to municipal water, the well will be properly closed in accordance with ANR, Chapter 21, Water Supply Rule or converted into a long-term monitoring well.

2.0 Performance Standards

The performance standards for CAP2 OUB are specified in Appendix A of the Consent Order and address the requirements associated with the POET OM&M Plan, the LTM Plan, and the Long-Term MNA Plan and are incorporated into these Plans (Attachment D, Attachment E, and Attachment F, respectively). These performance standards also address the overall completion of the corrective actions for the CAAs.

Compliance with the performance standards shall be documented by submitting monitoring results and operation/maintenance records to Vermont Department of Environmental Conservation (VTDEC) as specified in the individual Plans.

The performance standards for the CAAs OUB include:

- Groundwater – PFAS concentrations are below the regulatory standards at groundwater compliance points established by the Secretary for the CAAs and Saint-Gobain has established there is a stable or decreasing trend, meaning PFAS concentrations were below the regulatory standard for eight consecutive rounds of quarterly sampling and the statistical trend analysis for eight quarters of sampling shows an overall downward trend in PFAS concentration in the water supply or a flat trend if the concentrations are below the regulatory standard. The regulatory

standard for groundwater is established by the Groundwater Protection Rule and Strategy, as defined by the Consent Order, Appendix A.

- Soil – the combined concentrations of PFOA, PFOS, PFHxS, PFHpA, and PFNA concentrations at soil compliance points established by the Secretary are below the residential and nonresidential soil standards or appropriate institutional controls are in place. The regulatory standard for soil is the direct contact soil screening level, as defined by the Consent Order, Appendix A.
- Drinking water supply wells – PFAS is not present in any drinking water supply wells at or above the regulatory standard and Saint-Gobain establishes a stable or decreasing trend, meaning PFAS concentrations below the regulatory standard for eight consecutive rounds of quarterly sampling and the statistical trend analysis for eight quarters of sampling shows an overall downward trend in PFAS concentration in the water supply or a flat trend if the concentrations are below the regulatory standard. The regulatory standard for drinking water is established by the Groundwater Protection Rule and Strategy, as defined by the Consent Order, Appendix A.
- Surface water – Vermont water quality standards are achieved at any surface water compliance point established for the CAAs. The regulatory standard for surface water is established by the Vermont Water Quality Standards, as defined by the Consent Order, Appendix A.
- All required institutional controls, engineered controls, and inspection plans are in place.
- All groundwater monitoring wells are properly closed unless such wells are required for any required institutional controls, engineered controls, or inspection plans, or otherwise approved by the State of Vermont (State) to remain open.
- All site remedial infrastructure or monitoring points are properly closed, unless part of ongoing institutional controls, engineered controls, or inspection plans, or otherwise approved by the State to remain open.
- Any outstanding or overdue balances owed to the State have been paid.

3.0 Remedial Construction Plan

Construction plans and specifications are provided in the individual Plans, where applicable, and will include the signature of a Vermont-licensed professional engineer, where applicable.

4.0 Waste Management Plan

Excess soil and/or groundwater generated during implementation of the individual Plans will be managed in accordance with the individual Plans, where applicable, and as approved by VTDEC.

5.0 Implementation Schedule

Implementation schedules that include milestones, where applicable, are specified in the individual Plans.

6.0 Corrective Action Maintenance Plan

Maintenance plans, if applicable, are included in the individual Plans.

7.0 Institutional Controls

As specified in the Consent Order, the groundwater within the CAAs will be reclassified by the State in accordance with the IROCPR and state groundwater protection rules. The applicable institutional controls are specified in the Institutional Control Plan (Attachment G). To the extent allowed by law, the State may use its reclassification authority to develop well construction standards to the extent that such standards may avoid the consumption or use of water containing PFAS-regulated compounds.

8.0 Quality Assurance and Quality Control

The Quality Assurance and Quality Control (QA/QC) requirements are included in the individual Plans, where applicable. All QA/QC activities will be performed in accordance with the following supporting documents:

- Quality Assurance Project Plan (QAPP), dated July 2019, which provides project-specific organization details, objectives, data acquisition, data assessment, oversight, data review procedures, and analytical parameters. Protocols for sample collection, handling, storage, chain-of-custody, laboratory and/or field analyses, data evaluation and validation, and reporting are also addressed.
- QAPP Addendum, dated January 2020, which provides updated analytical methods and project-specific organization details.

9.0 Public Notice

Attachment H contains the public notice that will be sent to impacted property owners on a form provided by the Secretary. This will include approximately 180 property owners where ongoing monitoring will be completed in accordance with CAP2. A copy of CAP2 will be posted electronically for 30 days for public comment.

Figures

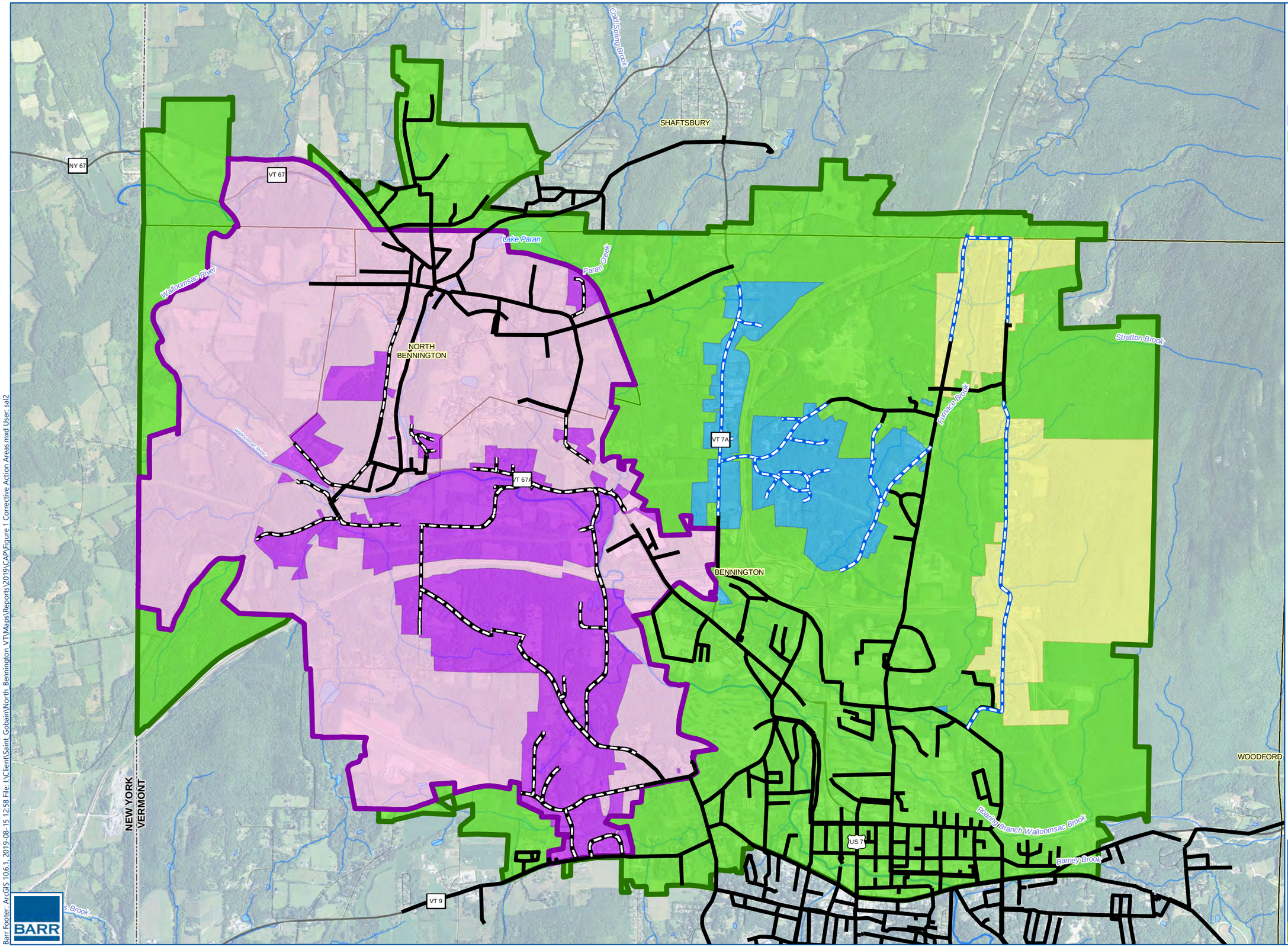
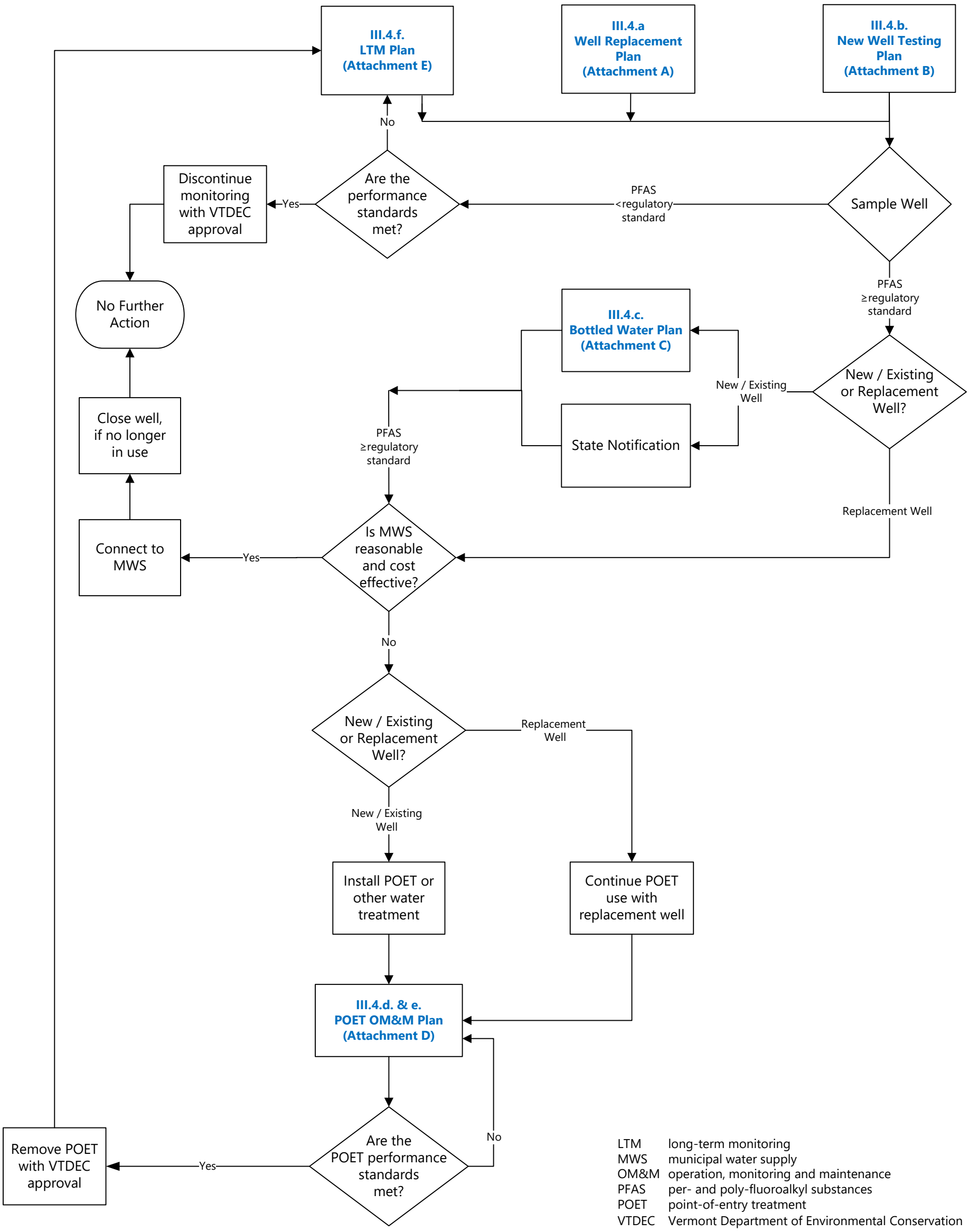

Cold Spring Brook
SHAFTSBURY
NY 67
VT 67
Lake Paran
Paran Creek
Walloomsac River
NORTH BENNINGTON
VT 67A
Stratton Brook
Furnace Brook
BENNINGTON
WOODFORD
NEW YORK
VERMONT
US 7
Roaring Branch Walloomsac Brook
Barney Brook
VT 9
Potential Municipal Waterline MSK 03192019
Waterline Installed 2017-2018
Existing Waterline
Corrective Action Area I
Corrective Action Area II
CAAI, OUA - Waterlines Connected Per Corrective Action
CAAI, OUB - Includes Existing Connections AND Parcels Without Connections
CAAII, OUA - Proposed Waterline Connections
CAAII, OUB - Includes Existing Connections AND Parcels Without Connections
CAAII, OUC - Proposed Waterline Connections
Township/Village Boundary
State Boundary
Features shown are consistent with Appendix B of the Consent Order, dated May 28, 2019.
N
0
2,500
Feet
CORRECTIVE ACTION AREAS
Bennington, VT
FIGURE 1
BARR
Barr Footer: ArcGIS 10.6.1, 2019-08-15 12:58 File: i:\Client\Saint_Gobain\North_Bennington_VT\Maps\Reports\2019\CAP\Figure 1 Corrective Action Areas.mxd User: sal2

Figure 2
Corrective Action Plan Framework
Corrective Action Area I – Operable Unit B

Saint-Gobain Performance Plastics
Bennington, VT



LTM	long-term monitoring
MWS	municipal water supply
OM&M	operation, monitoring and maintenance
PFAS	per- and poly-fluoroalkyl substances
POET	point-of-entry treatment
VTDEC	Vermont Department of Environmental Conservation

Referenced Plans are included as Attachments to the Corrective Action Plan. The Long-Term Monitored Natural Attenuation (MNA) Plan (Attachment F) and an Institutional Control Plan (Attachment G) are also part of the Corrective Action Plan and included as attachments; however, because they are independent of this framework they are not referenced in the above framework.

Attachments

Attachment A

Plan for Private Well Replacement at Locations with POETs

Plan for Private Well Replacement at Locations with POETs

Corrective Action Areas I and II – Operable Unit B
Attachment A

Prepared for
Saint-Gobain Performance Plastics

March 2020

A1.0 Introduction

This Plan for Private Water Well Replacement at locations with point-of-entry treatment (POET) systems (Well Replacement Plan), prepared by Barr Engineering Co. (Barr) on behalf of Saint-Gobain Performance Plastics (Saint-Gobain), complies with the Consent Order and Final Judgment, dated May 28, 2019 (Consent Order). This Consent Order supersedes the Consent Order and Final Judgment, dated October 2, 2017. Specifically, this Well Replacement Plan addresses Appendix A, Section IV Corrective Action Area II – Operable Unit B, paragraph 8a, of the Consent Order, which requires a plan for siting, drilling, and testing new private wells at locations within Correction Action Areas Operable Unit B (CAAs OUB) that have POET systems as of the date of the Consent Order.

The objective of the Well Replacement Plan is to provide an alternate to the POET systems if well replacements are shown to be a more feasible and effective means for providing drinking water that meets the regulatory standard for per- and poly-fluoroalkyl substances (PFAS) pursuant to the Consent Order. This Well Replacement Plan applies to private wells within the CAAs OUB that have been previously evaluated for municipal water connections, but where POET systems remain. Where appropriate, properties with private wells and POET systems may be re-evaluated for municipal water connections prior to evaluating the private well for well replacement. This Well Replacement Plan excludes locations with POET systems that are currently proposed to be connected or are already connected to the municipal water supply.

A2.0 Summary of Previous Well Replacement Activities

Barr is currently completing the work described in the *Revised Work Plan Domestic Water Well Replacement: Bennington, Vermont, dated September 2017* (Well Replacement Work Plan), approved by the Vermont Department of Environmental Conservation (VTDEC) on September 12, 2017. The purpose of the tasks described in the Well Replacement Work Plan was to evaluate, on a well-by-well basis, if well construction can explain the isolated groundwater concentrations exceeding the regulatory standard for PFAS in areas where other nearby or adjacent water wells have no detectable concentrations.

Well replacement activities were conducted at six properties with POET systems in CAAI. The results of the well replacement activities are summarized in the *Private Well Replacement Pilot Study Summary Report, Corrective Action Area I, Operable Unit B, North Bennington and Bennington, Vermont* (Pilot Study Summary Report) submitted to VTDEC on September 30, 2019. The Pilot Study Summary Report includes a framework for evaluating additional well replacement candidates, considerations for well design, and incremental costs associated with the potential well design modifications.

A3.0 Well Replacement Plan

Based on the results of the previous well replacement activities, Barr will evaluate the feasibility of replacing other private water wells in CAAs OUB that currently operate with POET systems. If the replacement wells reduce PFAS concentrations to a concentration consistently below the regulatory standard in POET system influents, Saint-Gobain will assess and consider replacement of other private

wells at locations with POET systems. Proposed assessment criteria for evaluating candidate wells for replacement are included in the *Work Plan, Private Water Well Replacement, Corrective Action Area I, Operable Unit B, Bennington, Vermont*, dated October 2019 (Well Replacement Work Plan, CAAI OUB).

If the replacement wells do not effectively reduce PFAS concentrations in the POET influent to below the regulatory standard, Saint-Gobain will re-assess if it is feasible and/or cost-effective to connect individual locations to the municipal water lines. If it is not feasible and/or cost-effective to connect the location to the municipal water lines, the existing POET system will be maintained in accordance with the approved *Operation & Maintenance Manual, Point-of-Entry Systems (POET), Private Water Supply Systems, North Bennington, Bennington County, Vermont*, dated March 2018.

The iterative evaluation of well replacement will continue until the locations with POET systems have been evaluated for well replacement, connection to municipal water, or continued POET system use. As described in the Well Replacement Work Plan, CAAI OUB, the eight remaining private wells with POETs within CAAI are being evaluated for replacement. In the future, if well replacement is determined to be an effective remedy, the remaining approximately 20 wells with POET systems within CAAII will also be evaluated. If additional wells within the CAAs OUB exceed regulatory standards, POET systems will be installed in accordance with the *Plan for Operation, Maintenance & Monitoring of Point-of-Entry Treatment (POET) Systems (*Attachment D) and will be evaluated for well replacement. Property owners where well replacement is being evaluated will be contacted individually.

A4.0 Schedule

Work on private well replacement is ongoing and is being completed in consultation with VTDEC.

A5.0 Reporting

Summary Reports will be submitted following the installation of replacement wells in the CAAs, as appropriate, based on discussions with VTDEC. The evaluation phase will begin after the Corrective Action Plan is finalized, which is expected to occur in early 2020. Well Completion Reports for each replacement well will be submitted by the drilling subcontractor within 90 days of completion of the replacement well, as required by the VTDEC.

Acronyms

CAAs OUB	Corrective Action Areas Operable Unit B
PFAS	per- and poly-fluoroalkyl substances
POET	point-of-entry treatment
VTDEC	Vermont Department of Environmental Conservation

Attachment B

Plan for Testing New Wells

Plan for Testing New Water Wells

Corrective Action Areas I and II – Operable Unit B
Attachment B

Prepared for
Saint-Gobain Performance Plastics

March 2020

B1.0 Introduction

This Plan for Testing New Water Wells (New Well Testing Plan), prepared by Barr Engineering Co. (Barr) on behalf of Saint-Gobain Performance Plastics (Saint-Gobain), complies with the Consent Order and Final Judgement, dated May 28, 2019 (Consent Order). This Consent Order supersedes the Consent Order and Final Judgement, dated October 2, 2017. Specifically, this New Well Testing Plan addresses Appendix A, Section IV Corrective Action Area II – Operable Unit B, paragraph 8b, of the Consent Order, which requires a plan for testing new wells in Corrective Action Areas Operable Unit B (CAAs OUB) and implementing a remedy, if necessary.

A new water well is a permitted well or an unpermitted replacement well allowed under the applicable state rules, installed before or after the effective date of the Consent Order. For new wells that require a permit (permitted well), the State of Vermont (State) will notify Saint-Gobain that a well will need testing within 120 days of issuing a new permit. The intent of the New Well Testing Plan is to determine if the well water from a new water well installed in CAAs OUB has a per- and poly-fluoroalkyl substances (PFAS) concentration that is at or above the regulatory standard. The current regulatory standard established by the Groundwater Protection Rule and Strategy is 20 parts per trillion (ppt) for the combined concentrations (sum of): perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), and perfluorononanoic acid (PFNA).

The outcome of the New Well Testing Plan will be to select and implement an appropriate remedy for the new well, if necessary. Figure B1 is a flowchart of the process associated with this New Well Testing Plan.

B2.0 Pre-Sampling Notification of a New Well

Prior to sample collection, a new well must be proposed within CAAs OUB. Within 120 days of the State issuing a permit, the State will notify Saint-Gobain of the permitted new well and its proposed location. If the new well is an unpermitted well or a well that was permitted before the effective date of the Consent Order but not constructed, the State will notify Saint-Gobain of the well within 120 days of their knowledge of the well.

B3.0 Well Sampling and Testing

Following installation of a well by a licensed well driller contracted by the property owner or being notified of an unpermitted well and Saint-Gobain's receipt of the required notification from the State as discussed in Section B2.0, Saint-Gobain will offer to test the new well for PFAS at no cost to the property owner. Provided access is granted, Saint-Gobain and/or the State, as appropriate, will collect and analyze a water sample to determine if the PFAS concentration in the new well is at or above the regulatory standard.

If the groundwater concentration of PFAS in the new well is below the regulatory standard, Saint-Gobain will notify the State of the test result within the reporting schedule defined by the Consent Order (i.e., 30 days from sample collection). Following State notification, Saint-Gobain will monitor the new well in

accordance with the Long-Term Monitoring (LTM) Plan (Attachment E) and revise the LTM Plan to include the new well location.

If the groundwater concentration of PFAS in the new well is at or above the regulatory standard, Saint-Gobain will notify the State as soon as practicable of the new well test results and provide bottled water to the property owner, as outlined in the Bottled Water Plan (Attachment C). Saint-Gobain will also review the well installation details to understand whether State-approved methods for well design and construction were followed.

Saint-Gobain will assess whether it is technically feasible and cost-effective to connect the property to the municipal water lines, and, depending on the analysis and consultation with the State, will either coordinate the connection of the property to the municipal water supply or initiate the installation of a point-of-entry treatment (POET) system.

If the property is connected to the municipal water supply, Saint-Gobain will discontinue providing bottled water and take no further action. If a POET system is installed, the POET system will be maintained in accordance with the approved POET OM&M Manual (Attachment D).

B4.0 Schedule

Well testing will be initiated following notification by the State.

B5.0 Reporting

Reporting to the State will be performed in accordance with the Consent Order (within 10 days of validated sampling results from the laboratory or 30 days from the sampling date, whichever is sooner).

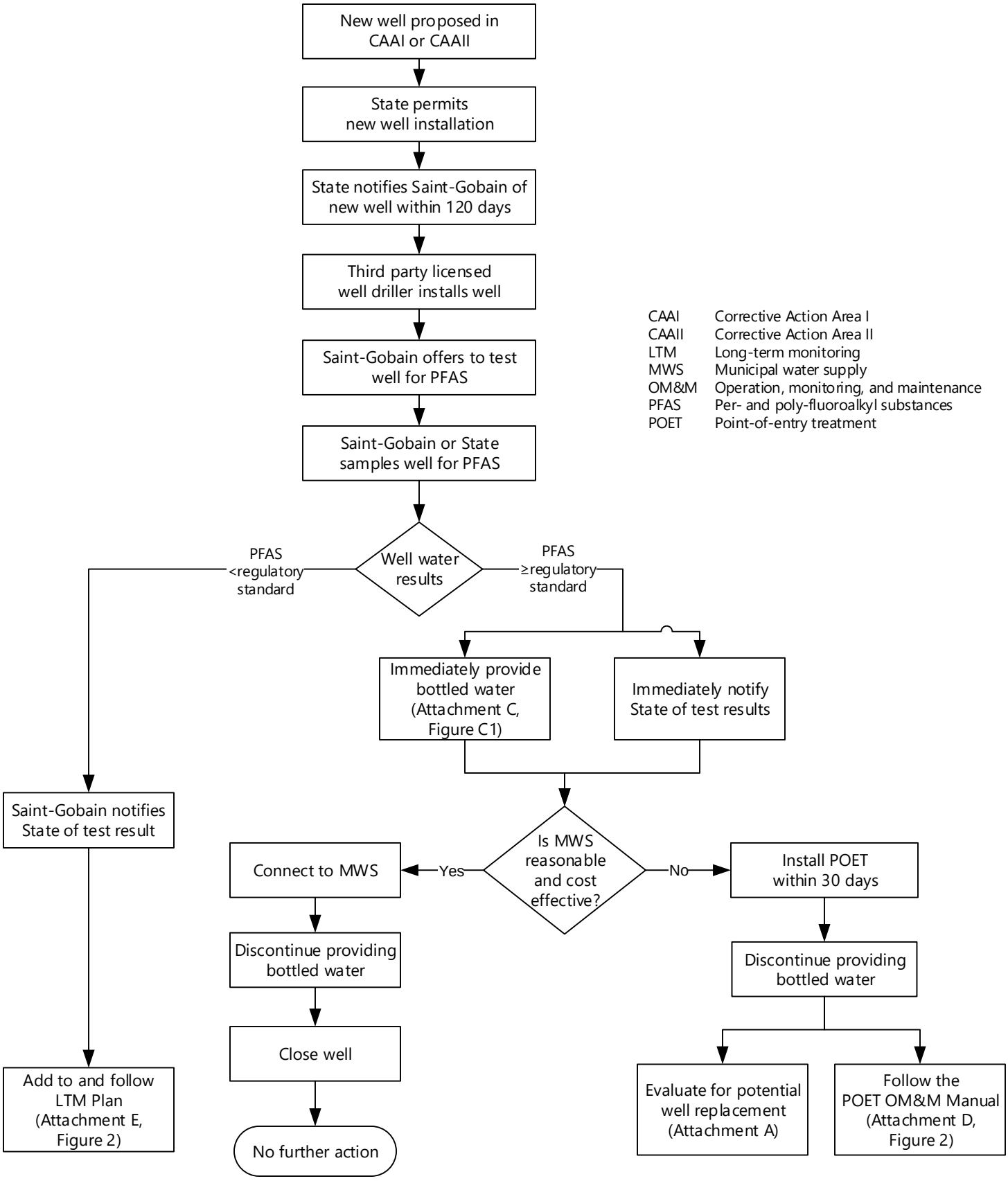
List of Attachments

Figure B1 Flowchart for Testing New Wells

Acronyms

CAAs OUB	Corrective Action Areas – Operable Unit B
LTM	long-term monitoring
PFAS	per- and poly-fluoroalkyl substances
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
POET	point-of-entry treatment
ppt	parts per trillion

Figure B1
Flowchart for Testing New Wells
Corrective Action Areas I and II – Operable Unit B
Saint-Gobain Performance Plastics
Bennington, VT



Attachment C

Bottled Water Plan

Bottled Water Plan

Corrective Action Areas I and II – Operable Unit B
Attachment C

Prepared for
Saint-Gobain Performance Plastics

March 2020

C1.0 Introduction

This Plan for providing Bottled Water (Bottled Water Plan), prepared by Barr Engineering Co. (Barr) on behalf of Saint-Gobain Performance Plastics (Saint-Gobain), complies with the Consent Order and Final Judgment, dated May 28, 2019 (Consent Order). This Consent Order supersedes the Consent Order and Final Judgment, dated October 2, 2017. Specifically, this Bottled Water Plan addresses Appendix A, Section IV Corrective Action Area II – Operable Unit B, paragraph 8c, of the Consent Order, which requires that bottled water be provided for properties in the Corrective Action Areas Operable Unit B (CAAs OUB) where the concentration of per- and poly-fluoroalkyl substances (PFAS) is at or above the regulatory standard in a replacement well, new well, and/or any well being sampled as part of the long-term monitoring (LTM) plan. The current regulatory standard established by the Groundwater Protection Rule and Strategy is 20 parts per trillion (ppt) for the combined concentrations (sum of): perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), and perfluorononanoic acid (PFNA).

The intent of the Bottled Water Plan is to describe the methods and procedures to be followed when providing bottled water to such properties. Figure C1 is a flowchart of the process associated with this Bottled Water Plan.

C2.0 Proposed Scope of Work

After receipt of the water well sampling results within the reporting schedule defined by the Consent Order (i.e., 10 days following data validation or 30 days from sample collection, whichever is sooner), Saint-Gobain will send a list of eligible properties directly to the State of Vermont (State) and a bottled water provider.

Saint-Gobain will coordinate with the State to provide each property owner the results of the sampling event and to inform the owner of his or her eligibility to receive bottled water at no cost. The notification will include directions for signing up for bottled water delivery, including the contact information for the bottled water provider. Bottled water delivery will then begin after the property owner contacts the water provider and requests delivery.

Bottled water will continue to be provided to eligible property owners until any one of the following conditions is met:

- Saint-Gobain has demonstrated and the State concurs that a point-of-entry treatment (POET) system is operating effectively as set forth in the POET Operation, Monitoring, and Maintenance Manual;
- The property is connected to the municipal water system; or
- The PFAS concentration is below the regulatory standard for eight consecutive rounds of quarterly sampling and the statistical trend shows an overall downward trend in PFAS concentrations or a flat trend of PFAS concentrations below the regulatory standard.

C3.0 Schedule

Saint-Gobain will offer bottled water to eligible property owners following receipt of sampling results indicating PFAS concentrations at or exceeding the regulatory standard.

C4.0 Reporting

Saint-Gobain will provide a list of eligible properties to the State and to a bottled water contractor. Saint-Gobain will coordinate with the State to provide each property owner the results of the sampling event, the information regarding their eligibility to receive bottled water, and/or the termination of bottled water delivery.

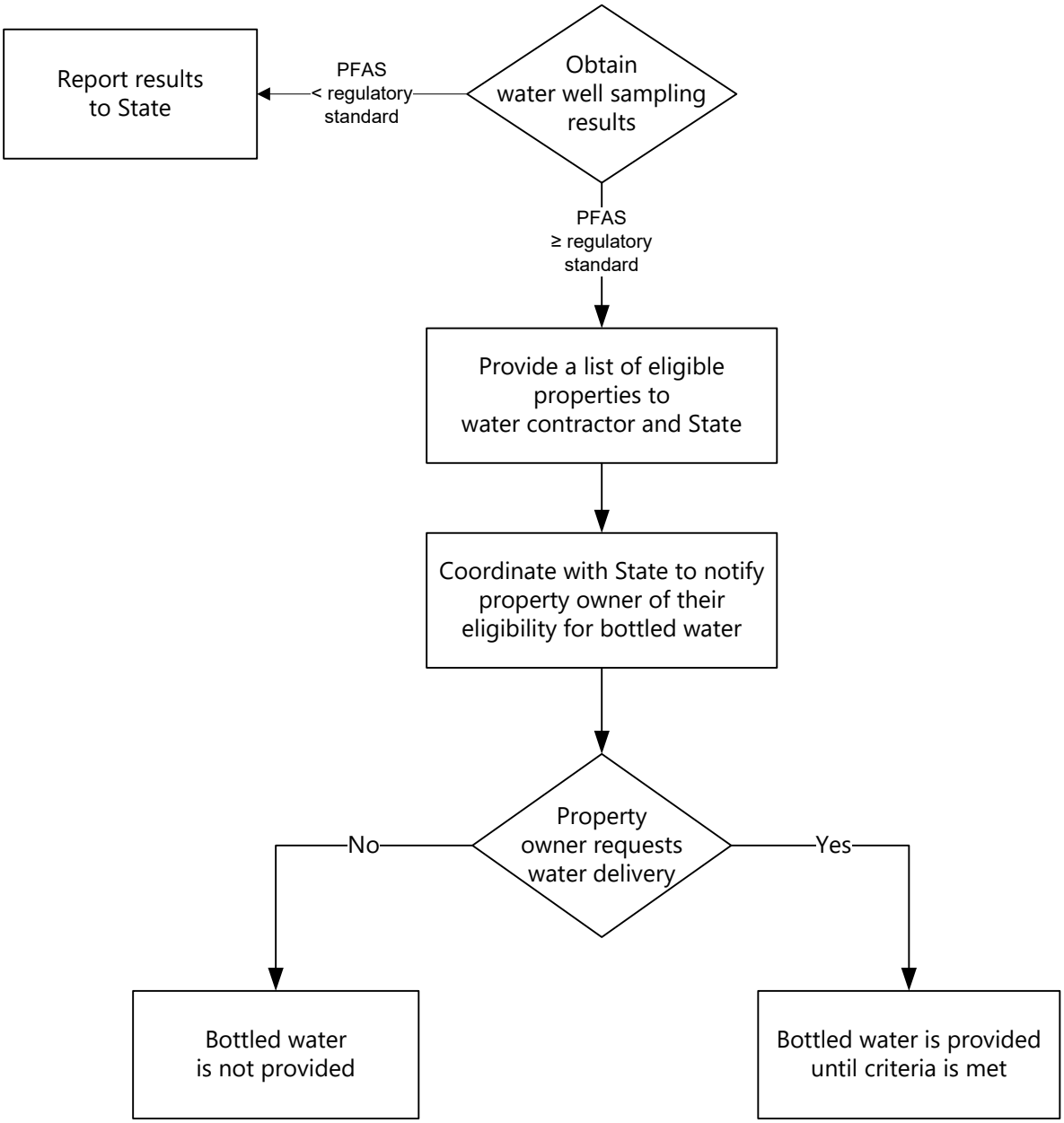
List of Attachments

Figure C1 Flowchart for the Bottled Water Plan

Acronyms

CAAs OUB	Corrective Action Areas – Operable Unit B
LTM	long-term monitoring
PFAS	per- and poly-fluoroalkyl substances
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
POET	point-of-entry treatment
ppt	parts per trillion

Figure C1
Flowchart for the Bottled Water Plan
Corrective Action Areas I and II – Operable Unit B
Saint-Gobain Performance Plastics
Bennington, VT



PFAS Per- and poly-fluoroalkyl substances

Attachment D

POET OM&M Manual

Plan for Operation, Maintenance & Monitoring of Point-of-Entry Treatment (POET) Systems

Corrective Action Areas I and II – Operable Unit B
Attachment D

Prepared for
Saint-Gobain Performance Plastics

March 2020

D1.0 Introduction

This Plan for Operation, Maintenance & Monitoring of Point-of-Entry Treatment (POET) Systems (POET OM&M Plan), prepared by Barr Engineering Co. (Barr) on behalf of Saint-Gobain Performance Plastics (Saint-Gobain), complies with the Consent Order and Final Judgment, dated May 28, 2019 (Consent Order). This Consent Order supersedes the Consent Order and Final Judgment, dated October 2, 2017. Specifically, this POET OM&M Plan addresses Appendix A, Section IV Corrective Action Area II – Operable Unit B, paragraph 8d, of the Consent Order, which requires a plan long-term monitoring, operation, and maintenance of POETs installed in the Corrective Action Areas Operable Unit B (CAAs OUB), if necessary.

POET OM&M at private wells within CAAs OUB with concentrations of per- and poly-fluoroalkyl substances (PFAS) greater than the regulatory standard will be performed under this POET OM&M Plan. Currently, POET systems have been installed at 132 private wells and point-of-use (POU) treatment systems have been installed at 10 private wells in CAAs OUB where PFAS concentrations are at or above the regulatory standard. The list of current POETs and POU systems are summarized in Table D1 and are shown on Figure D1. The current regulatory standard established by the Groundwater Protection Rule and Strategy is 20 parts per trillion (ppt) for the combined concentrations (sum of): perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), and perfluorononanoic acid (PFNA). Private wells within CAAs OUB with PFAS concentrations below the regulatory standard are monitored in accordance with the Long-term Monitoring Plan (LTM Plan; Attachment E).

D2.0 Operation, Maintenance, and Monitoring Plan

The POET and POU OM&M manuals that describe the operation, maintenance, and monitoring for the systems are included in Attachment D1 and Attachment D2, respectively.

D3.0 Schedule

POET and POU system sampling will be completed in accordance with the POET OM&M Plan and POU OM&M manuals, respectively, contingent on gaining property access. Laboratory analytical results for each POET and POU system sampling event will be forwarded to Vermont Department of Environmental Conservation (VTDEC) in accordance with the reporting schedule defined by the Consent Order and provided in the POET and POU OM&M manuals.

D4.0 Reporting

On an annual basis, a summary of the POET and POU system analytical results and operation and maintenance activities completed under this POET OM&M Plan will be tabulated and provided to VTDEC. The annual summary will also include a compilation of the POET and POU systems sampled, where property access was denied or could not be coordinated, recommendations for adjusting sampling frequency, and other relevant notes collected during the sampling events.

List of Attachments

Acronyms

CAAs OUB	Corrective Action Areas – Operable Unit B
LTM	long-term monitoring
PFAS	per- and poly-fluoroalkyl substances
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
POET	point-of-entry treatment
POU	point of use
ppt	parts per trillion
VTDEC	Vermont Department of Environmental Conservation

Table D1
Active POET and POU Treatment Systems in the CAAs*
Bennington, VT
Saint-Gobain Performance Plastics

House #	Street	Town	Installation Date	Most Recent Sample Date
OUA				
96	Apple Hill Rd	Bennington	06/03/2016	6/14/2017
109	Apple Hill Rd	Bennington	06/03/2016	9/14/2018
152	Apple Hill Rd	Bennington	05/27/2016	6/14/2017
273	Apple Hill Rd	Bennington	05/24/2016	6/14/2017
288	Apple Hill Rd	Bennington	05/24/2016	7/29/2019
307	Apple Hill Rd	Bennington	05/27/2016	6/15/2017
333	Apple Hill Rd	Bennington	06/15/2016	7/29/2019
346	Apple Hill Rd	Bennington	05/25/2016	6/14/2017
514	Apple Hill Rd	Bennington	05/25/2016	7/29/2019
531	Apple Hill Rd	Bennington	05/26/2016	6/13/2017
544	Apple Hill Rd	Bennington	05/26/2016	7/29/2019
589	Apple Hill Rd	Bennington	07/14/2017	6/14/2018
685	Apple Hill Rd	Bennington	06/14/2016	8/3/2018
38	Astrachan Dr	Bennington	06/01/2016	12/6/2018
78	Astrachan Dr	Bennington	06/18/2016	8/2/2018
126	Astrachan Dr	Bennington	05/23/2016	7/29/2019
212	Astrachan Dr	Bennington	05/23/2016	7/16/2018
61	Autumn Acres Rd	Bennington	07/19/2016	6/12/2017
68	Autumn Acres Rd	Bennington	07/19/2016	8/2/2018
68	Beaudoin Ln	Bennington	12/02/2016	12/20/2018
113	Beaudoin Ln	Bennington	12/22/2016	12/20/2018
226	Beaudoin Ln	Bennington	12/05/2016	12/20/2018
1182	Becks Dr	Bennington	12/12/2016	3/6/2019
1400	Becks Dr	Bennington	06/15/2016	7/16/2018
1	Carpenter Ln	Bennington	06/14/2016	6/14/2018
32	Cortland Ln	Bennington	06/01/2016	8/2/2018
54	Cortland Ln	Bennington	06/01/2016	8/2/2018
150	Cortland Ln	Bennington	06/01/2016	8/2/2018
1366	East Rd	Bennington	06/14/2016	8/2/2018
155	Harwood Hill Rd	Bennington	06/28/2017	10/3/2017
162	Harwood Hill Rd	Bennington	07/09/2018	7/23/2018
563	Harwood Hill Rd	Bennington	08/11/2016	9/12/2018
583	Harwood Hill Rd	Bennington	08/11/2016	9/12/2018
782	Harwood Hill Rd	Bennington	10/31/2016	3/6/2019
864	Harwood Hill Rd	Bennington	06/29/2016	7/16/2018
1042	Harwood Hill Rd	Bennington	09/26/2016	10/27/2017
1079	Harwood Hill Rd	Bennington	09/23/2016	5/31/2018
1124	Harwood Hill Rd	Bennington	06/14/2016	10/27/2017
1152	Harwood Hill Rd	Bennington	06/09/2016	7/16/2018
1169	Harwood Hill Rd	Bennington	06/08/2016	10/4/2018
1198	Harwood Hill Rd	Bennington	06/09/2016	7/16/2018
1264	Harwood Hill Rd	Bennington	06/22/2016	7/16/2018
1267	Harwood Hill Rd	Bennington	10/10/2016	1/23/2018
1286	Harwood Hill Rd	Bennington	06/22/2016	8/10/2018
1361	Harwood Hill Rd	Bennington	11/18/2016	8/29/2017
1371	Harwood Hill Rd	Bennington	11/17/2016	5/31/2018
1411	Harwood Hill Rd	Bennington	06/06/2016	7/16/2018
1487	Harwood Hill Rd	Bennington	07/05/2016	6/7/2018
1709	Harwood Hill Rd	Bennington	12/05/2016	12/20/2018
1803	Harwood Hill Rd	Bennington	07/01/2017	10/12/2017
1869	Harwood Hill Rd, Sunset Farms MHP (POU)	Bennington	03/11/2019	--

Table D1
Active POET and POU Treatment Systems in the CAAs*
Bennington, VT
Saint-Gobain Performance Plastics

House #	Street	Town	Installation Date	Most Recent Sample Date
1905	Harwood Hill Rd	Bennington	07/21/2017	4/15/2019
50	Houghton Ln	Bennington	06/14/2016	10/4/2018
286	Houghton Ln	Bennington	06/30/2016	9/12/2018
397	Houghton Ln	Bennington	05/31/2016	6/27/2019
404	Houghton Ln	Bennington	08/25/2016	9/12/2018
55	McIntosh Ln	Bennington	06/08/2016	9/14/2018
70	McIntosh Ln	Bennington	06/09/2016	8/2/2018
105	McIntosh Ln	Bennington	07/08/2016	8/2/2018
112	McIntosh Ln	Bennington	12/26/2018	1/24/2019
118	McIntosh Ln	Bennington	06/07/2016	8/2/2018
121	McIntosh Ln	Bennington	06/23/2016	8/22/2018
36	Michaels Dr	Bennington	06/06/2016	9/12/2018
49	Michaels Dr	Bennington	06/06/2016	3/29/2018
66	Michaels Dr	Bennington	06/05/2016	9/12/2018
105	Michaels Dr	Bennington	06/05/2016	8/2/2018
108	Michaels Dr	Bennington	05/28/2016	6/13/2017
137	Michaels Dr	Bennington	04/19/2016	5/31/2018
175	Michaels Dr	Bennington	06/05/2016	8/27/2018
182	Michaels Dr	Bennington	06/05/2016	6/27/2019
189	Michaels Dr	Bennington	06/06/2016	8/2/2018
190	Michaels Dr	Bennington	06/14/2016	6/27/2019
210	Michaels Dr	Bennington	06/22/2016	8/2/2018
21	Russett Dr	Bennington	06/02/2016	8/22/2018
22	Russett Dr	Bennington	01/07/2019	4/17/2019
60	Russett Dr	Bennington	06/15/2016	9/14/2018
85	Russett Dr	Bennington	06/02/2016	8/2/2018
93	Russett Dr	Bennington	06/02/2016	8/3/2018
112	Russett Dr	Bennington	06/02/2016	8/22/2018
133	Russett Dr	Bennington	06/02/2016	9/14/2018
140	Russett Dr	Bennington	04/14/2017	6/14/2018
13	Settlers Rd	Bennington	06/22/2016	8/2/2018
59	Settlers Rd	Bennington	08/02/2016	9/12/2018
78	Squaw Hill Rd	Bennington	06/10/2016	7/8/2016
251	Squaw Hill Rd	Bennington	06/10/2016	10/4/2018
2	Sunset Farms MHP (POU)	Bennington	03/12/2019	--
6	Sunset Farms MHP (POU)	Bennington	03/11/2019	3/26/2019
9	Sunset Farms MHP (POU)	Bennington	03/11/2019	3/26/2019
10	Sunset Farms MHP (POU)	Bennington	03/11/2019	--
11	Sunset Farms MHP (POU)	Bennington	03/11/2019	--
12	Sunset Farms MHP (POU)	Bennington	03/14/2019	7/30/2019
14	Sunset Farms MHP (POU)	Bennington	03/14/2019	7/30/2019
82	Transport Dr	Bennington	07/06/2016	8/10/2018
412	Willow Rd	Bennington	05/25/2016	5/31/2018
561	Willow Rd	Bennington	05/25/2016	6/27/2019
593	Willow Rd	Bennington	08/26/2016	9/12/2018
685	Willow Rd	Bennington	06/08/2016	6/27/2019
713	Willow Rd	Bennington	06/08/2016	10/4/2018
722	Willow Rd	Bennington	06/04/2016	6/27/2019
737	Willow Rd	Bennington	06/04/2016	6/13/2017

Table D1
Active POET and POU Treatment Systems in the CAAs*
Bennington, VT
Saint-Gobain Performance Plastics

House #	Street	Town	Installation Date	Most Recent Sample Date
OUB				
162	East Rd	Shaftsbury	07/20/2017	6/14/2018
1747	East Rd	Bennington	11/15/2016	5/31/2018
276	Fairview St	Bennington	05/18/2016	12/12/2018
69	Gulley Ln	Bennington	10/02/2016	6/17/2019
91	Gulley Ln	Bennington	09/29/2016	6/17/2019
169	Harrington Rd	Shaftsbury	09/29/2016	11/9/2016
761	Harrington Rd	Bennington	04/08/2016	7/8/2019
1278	Harrington Rd	Bennington	12/04/2018	7/2/2019
1682	Harrington Rd	Bennington	04/08/2016	6/25/2019
1731	Harrington Rd	Bennington	06/23/2017	12/12/2018
748	Harvest Hills Dr	Shaftsbury	06/18/2018	8/16/2019
1688	Harwood Hill Rd (POU)	Bennington	09/28/2017	10/18/2017
1279	Houghton Ln	Bennington	05/23/2016	5/31/2018
514	Ore Bed Rd	Bennington	03/30/2016	7/2/2019
995	Ore Bed Rd	Bennington	Request from Culligan, sometime September 2019	8/2/2019
1075	Ore Bed Rd	Bennington	11/28/2018	8/16/2019
554	Overlea Rd (POU)	Bennington	08/16/2018	5/1/2018
570	Overlea Rd	Bennington	11/10/2016	6/17/2019
802	Overlea Rd	Bennington	06/23/2017	2/12/2019
286	Rice Ln	Bennington	08/11/2016	6/20/2019
1661	River Rd	Bennington	12/03/2018	7/2/2019
632	Rocky Ln	Bennington	09/06/2016	10/4/2018
801	Rocky Ln	Bennington	05/13/2019	5/13/2019
1102	Rocky Ln	Bennington	06/01/2016	3/28/2018
88	Settlers Rd	Bennington	07/01/2016	8/10/2018
213	Settlers Rd	Bennington	07/20/2016	4/17/2019
264	Spring Hill Rd	Bennington	11/18/2016	5/31/2018
380	Spring Hill Rd	Bennington	06/29/2016	10/12/2017
190	Town Line Rd	Bennington	12/21/2018	1/24/2019
498	Town Line Rd	Shaftsbury	08/12/2016	9/12/2018
592	Town Line Rd	Shaftsbury	06/19/2017	6/20/2019
1214	Vail Rd	Bennington	01/02/2019	8/16/2019
1302	Vail Rd	Bennington	05/13/2019	6/17/2019
471	Vt Route 67 W	Shaftsbury	04/09/2016	12/12/2018
662	Vt Route 67 W	Shaftsbury	04/20/2016	6/19/2019
1170	Vt Route 67 W	Shaftsbury	06/27/2017	12/12/2018

Notes:

* List subject to change in consultation with VTDEC
--: No Data
MHP: Mobile Home Park
POET: Point-of-Entry Treatment
POU: Point-of-Use
OUA: Operable Unit A
OUB: Operable Unit B

NEW YORK
VERMONT
SHAFTSBURY
NORTH BENNINGTON
BENNINGTON
Cold Spring Brook
Paran Creek
Lake Paran
Stratton Brook
Walloomsac River
Furnace Brook
Roaring Branch
Walloomsac Brook
Barney Brook
NY 67
VT 67
VT 7A
US 7
VT 67A
VT 279
US 7;VT 279
VT 9
748 HARVEST HILLS DR
662 VT ROUTE 67 W
471 VT ROUTE 67 W
1170 VT ROUTE 67 W
169 HARRINGTON RD
1731 HARRINGTON RD
1682 HARRINGTON RD
1278 HARRINGTON RD
761 HARRINGTON RD
1661 RIVER RD
995 ORE BED RD
514 ORE BED RD
1075 ORE BED RD
1302 VAIL RD
1214 VAIL RD
276 FAIRVIEW ST
91 GULLEY LN
554 OVERLEA RD
69 GULLEY LN
570 OVERLEA RD
802 OVERLEA RD
2 SUNSET FARMS MHP
1803 HARWOOD HILL RD
68 BEAUDOIN LN
1709 HARWOOD HILL RD
1688 HARWOOD HILL RD
380 SPRING HILL RD
13 SETTLERS RD
59 SETTLERS RD
264 SPRING HILL RD
213 SETTLERS RD
88 SETTLERS RD
1264 HARWOOD HILL RD
1198 HARWOOD HILL RD
1124 HARWOOD HILL RD
1152 HARWOOD HILL RD
1079 HARWOOD HILL RD
1042 HARWOOD HILL RD
50 HOUGHTON LN
286 RICE LN
864 HARWOOD HILL RD
782 HARWOOD HILL RD
583 HARWOOD HILL RD
563 HARWOOD HILL RD
96 APPLE HILL RD
109 APPLE HILL RD
152 APPLE HILL RD
273 APPLE HILL RD
288 APPLE HILL RD
307 APPLE HILL RD
333 APPLE HILL RD
346 APPLE HILL RD
531 APPLE HILL RD
38 ASTRACHAN DR
78 ASTRACHAN DR
126 ASTRACHAN DR
21 RUSSETT DR
22 RUSSETT DR
60 RUSSETT DR
85 RUSSETT DR
93 RUSSETT DR
112 RUSSETT DR
133 RUSSETT DR
140 RUSSETT DR
155 HARWOOD HILL RD
162 HARWOOD HILL RD
498 TOWN LINE RD
592 TOWN LINE RD
190 TOWN LINE RD
1905 HARWOOD HILL RD
1869 HARWOOD HILL RD
14 SUNSET FARMS MHP
11 SUNSET FARMS MHP
6 SUNSET FARMS MHP
12 SUNSET FARMS MHP
10 SUNSET FARMS MHP
9 SUNSET FARMS MHP
226 BEAUDOIN LN
113 BEAUDOIN LN
1102 ROCKY LN
1487 HARWOOD HILL RD
1411 HARWOOD HILL RD
1361 HARWOOD HILL RD
1371 HARWOOD HILL RD
1286 HARWOOD HILL RD
1267 HARWOOD HILL RD
1169 HARWOOD HILL RD
82 TRANSPORT DR
632 ROCKY LN
801 ROCKY LN
162 EAST RD
78 SQUAW HILL RD
251 SQUAW HILL RD
286 HOUGHTON LN
397 HOUGHTON LN
404 HOUGHTON LN
36 MICHAELS DR
49 MICHAELS DR
66 MICHAELS DR
105 MICHAELS DR
108 MICHAELS DR
137 MICHAELS DR
175 MICHAELS DR
182 MICHAELS DR
189 MICHAELS DR
190 MICHAELS DR
210 MICHAELS DR
68 AUTUMN ACRES RD
61 AUTUMN ACRES RD
1747 EAST RD
1279 HOUGHTON LN
1366 EAST RD
1400 BECKS DR
1182 BECKS DR
412 WILLOW RD
561 WILLOW RD
593 WILLOW RD
685 WILLOW RD
713 WILLOW RD
722 WILLOW RD
737 WILLOW RD
514 APPLE HILL RD
544 APPLE HILL RD
589 APPLE HILL RD
685 APPLE HILL RD
212 ASTRACHAN DR
32 CORTLAND LN
54 CORTLAND LN
150 CORTLAND LN
55 MCINTOSH LN
70 MCINTOSH LN
105 MCINTOSH LN
112 MCINTOSH LN
118 MCINTOSH LN
121 MCINTOSH LN
1 CARPENTER LN

Private Well with POET System
- OUA
- OUB

Private Well with POU System
- OUA
- OUB

Corrective Action Area
Parcel Boundary
State Boundary
Village/Township Boundary

Locations subject to change, in consultation with VTDEC.

N

0 2,500
Feet

PRIVATE WELLS WITH POET SYSTEMS
Bennington, VT
Saint-Gobain

FIGURE D1

BARR

Barr Footer: ArcGIS 10.7.1, 2020-01-10 14:11 File: I:\Client\Saint_Gobain\North_Bennington_VT\Maps\Reports\2020\CAP\Figure D1 Locations of Private Wells with POET Systems.mxd User: sal2

Attachment D1

Operation, Monitoring & Maintenance Manual, Point of Entry Systems (POET), Private Water Supply Systems, North Bennington, Bennington County, Vermont

January 2020

OPERATION, MONITORING & MAINTENANCE MANUAL (Rev. 3) Point of Entry Systems (POET) Private Water Supply Systems North Bennington & Bennington, Vermont

Prepared for:

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POET OM&M MANUAL (Rev. 3)
Village of N. Bennington & Town of Bennington, VT

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 General

This Point of Entry Treatment (POET) Operation, Monitoring and Maintenance (OM&M) Manual has been revised to comply with the Consent Order and Final Judgment, effective dated May 28, 2019, (Consent Order) which supersedes the Consent Order and Final Judgement dated October 2, 2017. The previous POET OM&M revision (Revision 2 dated March 8, 2018) was prepared pursuant to Vermont Department of Environmental Conservation (VTDEC) January 31, 2018, comments to the December 15, 2017 POET OM&M Manual.

The Consent Order defines two corrective action areas: Corrective Action Area I (CAAI) and Corrective Action Area II (CAAII) and, for the purpose of this plan, are collectively referred to as Corrective Action Areas (CAAs). CAAI generally consists of a bounded area west of Route 7 and CAAII generally consists of a bounded area east of Route 7. CAAI is divided into two operable units and CAAII is divided into three operable units. Operable Unit A (OUA) in CAAI and CAAII and Operable Unit C (OUC) in CAAII are the subject of separate corrective action plans prepared by the Vermont Agency of Natural Resources (ANR). Operable Unit B (OUB) in CAAI and CAAII are the subject of this corrective action plan.

The intent of this document is to provide the requirements for the installation, operation, monitoring and maintenance of POET systems installed at residential and other non-public water supply well locations within the Village of North Bennington (Village) and Town of Bennington (Town), Vermont. This manual does not pertain to Public Water Systems or Non Transient Water Systems which are addressed on a site-by-site basis.

The POETs are installed to treat all water entering the building from the current water supply source. In this manner, the POET provides treated water to all water fixtures (sinks, baths/showers, toilets, ice makers, outside hose connections, etc.) of the structure.

The treatment of per- and polyfluoroalkyl substances (PFAS) with use of Granular Activated Carbon (GAC) is well understood and demonstrated at multiple municipal water supply systems.

1.2 Project Background

Perfluorooctanoic acid (PFOA) is a member of the class of substances referred to as PFAS. PFAS have been produced and used in commercial products and industrial processes for over 60 years. Known commercial uses of PFAS include: water-, soil-, and stain-resistant coatings for clothing, leather, upholstery, and carpets; oil-resistant coatings for food contact paper; aviation hydraulic fluids; fire-fighting foams; paints, adhesives, waxes, polishes, and other products. Known industrial uses of PFAS include: surfactants, emulsifiers, wetting agents, flash inhibitors, additives, non-stick coatings on cookware, membranes for waterproof/ breathable clothing, electrical wire casing, fire and chemical resistant tubing, and plumbing thread seal tape.

Investigations conducted by the VTDEC in early 2016 within the Village of North Bennington, Vermont identified PFOA in several residential water supply wells in the immediate vicinity of the former Chemfab facility located at 1030 Water Street. The concentration of PFOA was detected at concentrations greater than the PFOA Vermont Drinking Water Heath Advisory. The VT Health Department subsequently promulgated (June 22, 2016) a drinking water health advisory of 20 parts per trillion (ppt) applicable to the sum of perfluorooctanesulfonic acid (PFOS) and PFOA. An emergency rule adopted on July 11, 2018, for the Vermont Groundwater Protection Rule & Strategy (Chapter 12 of Environmental Protection Rules) updated the PFAS-specific Vermont Groundwater Enforcement Standard to a concentration of 20 ppt for any combination of perfluorohexanesulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), perfluorononanoic acid (PFNA), PFOA, and PFOS (Regulatory Standard).

As a result of the initial PFOA detections in 2016, VTDEC required the installation of POETs at properties within the Village and Town with water supply wells with concentrations of PFOA at or greater than 20 ppt. The majority of POETs within the Village and Town have PFOA concentrations less than 200 ppt. POETs are currently being maintained at 132 locations. Table D1 provides a list of the addresses in which POETS are being maintained by Saint-Gobain in CAA1.

2.0 PURPOSE & ORGANIZATION OF MANUAL

2.1 Organizational Structure

Table 1 in Appendix A presents the overall project organization structure, and identifies the various agencies, firms and contractors and their overall responsibilities.

For this project, VTDEC and other State agencies are responsible for overall project oversight and management. Culligan of Vermont (Culligan) is the water treatment contractor for the POET installations. C.T. Male is responsible for the sampling and analysis of each installed POET as further discussed herein. Analytical results related to the ongoing operation of each POET are provided to VTDEC as they become available by C.T. Male. In turn, VTDEC issues the results to each owner of a property that has received a POET system.

2.2 O&M Contractor

Culligan, a Vermont licensed water treatment contractor, is responsible for the installation, scheduled inspection, and scheduled and non-scheduled maintenance of each POET system. In the event a new contractor takes over the responsibility of the OM&M of the POETs, VTDEC will be informed in advance of the change. The POET OM&M Manual will be revised to reflect the contractor change.

2.3 Treatment System Overview

The POET systems components include the follow:

- Pre-filter (Dual Gradient 50 -5 micron)
- Lead GAC Canister (2 ft3 Calgon Cullar F600AW)
- Lag GAC Canister (2 ft3 Calgon Cullar F600AW)
- Post-Filter (Dual Gradient 50 -5 micron)
- UV Lamp (VIQUA S8Q-PA)
- Flow Meter (total gallons)
- Influent, Midpoint and Effluent Water Sampling Ports

A schematic and picture of a typical POET system installation is presented in Appendix B. The manufacturer's information and specification sheets for each system component

are presented in Appendix C. The plumbing piping and fittings used are composed of PEX Products and are typically three-quarter inch diameter. All plumbing fittings are NSF approved.

3.0 OPERATION

3.1 Operational Overview

The POET system operates through pressurized flow from the water supply well pump and pressure tank system within the structure. Electrical service for the UV unit is taken from the electrical service (115V) within the building.

Well water from the water supply well/pressure tank first flows through a polypropylene pre-sediment filter. It is then plumbed to the Lead and Lag GAC canisters. GAC treated water then flows through a post- polypropylene sediment filter and a totalizing mechanical flow meter, to record the total gallons of water before passing through the UV unit. Lastly, the water passes through a flow controller to assure sufficient disinfection by the UV unit.

3.2 POET System Startup

Prior to installing a POET, Culligan completes a site visit to review the existing water system and area required for the equipment installation. In most instances the POET is installed within the basement of the building, but this may not always be possible depending on the set up of the existing water supply systems. During the pre-installation site visit, an un-treated water sample from the source is collected, analyzed and recorded by Culligan for Hardness, Iron, Manganese, Hydrogen Sulfide, Alkalinity, Total Dissolved Solids and pH. This data is retained by Culligan for future reference and evaluation.

Arsenic is a naturally occurring metal in the GAC media at very low concentrations and was detected in some of the POETs initially installed. To address the residual arsenic from the GAC media Calgon Cullar F400AW was replaced with Calgon Cullar F600AW. The production of Calgon Cullar F600AW involves an acid wash specifically used to remove residual naturally occurring arsenic from the GAC for drinking water applications. Prior to the installation of the GAC vessels, each vessel is also prewashed, backwashed and flushed by Culligan at its facility. Following the installation of a POET, approximately 200 gallons of water are flushed through the system prior to collecting the initial set of water samples for PFAS analyses.

At system startup, water samples are collected for PFAS analysis from the water sampling point located prior to the Lead GAC canister and from the effluent water sampling point after the Lag GAC canister. A visual check of the UV unit is completed to ensure it is operating. The total gallons of water treated are then recorded at the flow meter.

3.3 Laboratory Analyses

The influent, mid-point and effluent samples from the POETs are analyzed by EPA Method 537.1 for the following list of PFAS:

Analyte	Acronym	Chemical Abstract Services Registry Number (CASRN)
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluorononanoic acid	PFNA	375-95-1
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorotetradecanoic acid	PFTA	376-06-7
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluoroundecanoic acid	PFUnA	2058-94-8
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4

3.4 System Shutdown & Removal

The POETs are designed to operate continuously and to treat the supply water whenever there is water use within the building. Other than the UV unit which requires electrical power, the POET components rely on water pressure and flow to operate. The only time the POET will not treat water is during a power outage (i.e. as the water well pump will not be in operation).

Many locations equipped with a POET will be connected to municipal water. In these instances, the POET system will be disconnected and removed from the premises by Culligan. POETs which will remain in service will continue to be maintained in accordance with Section 4.0 of this OM&M plan until they can be removed as further described below.

For properties in the CAAs a POET system will be removed once the analytical results for the influent sampling port sample demonstrates PFAS concentrations below the Regulatory Standard pursuant to the Consent Order, and influent water concentrations have remained below the Regulatory Standard over a subsequent monitoring period of 8 quarters in accordance with the Long Term Monitoring (LTM) plan.

Upon achieving the criteria for the removal of a POET system, Culligan will remove all system components that were installed, and restore the water system to its pre-POET condition. The property owner will be given the opportunity to keep the system components after they have been permanently disconnected. If the property would like to reconnect the system after the system has been disconnected by Culligan, it will be the owners' responsibility to have a licensed water treatment specialist complete the work as well as be responsible for the POET system operation and maintenance.

If the removal criteria for a POET is achieved and the POET is removed, the related well will be classified as a Long Term Monitoring well and sampled in accordance with the approved LTM Plan.

For property owners deciding not to connect to municipal water in OUA, the POETs will be left in place and operation, maintenance and monitoring of this POET will become the responsibility of the property owner once the connections to the municipal water system in this area are complete. Before POET operation, monitoring and maintenance responsibilities are transferred to a property owner under this section, Saint-Gobain will

have its POET maintenance contractor perform one last maintenance on the POET system. If the lead and lag GAC vessels have not been replaced within the last 12 months at the time the municipal water line connections have been completed in the immediate area, both the lead and lag GAC vessels will be replaced with new vessels.

4.0 INSPECTION AND MAINTENANCE REQUIREMENTS

4.1 Scheduled Inspection and Maintenance

Following the installation of each POET system, a quality control inspection of the system will be completed by Culligan to ensure the system components have been installed and are properly functioning. The initial sampling/monitoring of each POET is generally completed several days after installation to allow for at least 200 gallons of the water to be treated by the POET system. The POET is not approved by VTDEC for consumption until the analytical results for the initial system sample have been received and the effluent sample indicates PFAS concentrations are not detected above the method detection limit (MDL). VTDEC will provide the initial POET system sample results and notification that the water is safe to consume to the POET recipients.

Scheduled maintenance of each POET system is as follows:

Pre and Post Filter Replacement:	Every 4 months
Ultraviolet Lamp Replacement:	Every 12 months
Ultraviolet Quartz Sleeve Cleaning:	Every 12 to 24 months
GAC Canister Replacement:	As needed depending on periodic analytical monitoring (see Section 4.2)

Non-scheduled POET system maintenance by Culligan is completed on an as-needed basis.

4.2 GAC Change Out

Following the collection and analysis of the initial effluent water sample from a POET system, subsequent samples will be collected from the midpoint sample port, between the Lead and Lag GAC canisters. Sampling at the midpoint ensures that if the Lead GAC media in the Lead canister has been saturated with PFAS it can be scheduled for change out.

The change out of the GAC canisters will be initiated when the PFOA concentration in the water sample collected from the midpoint sample port is above the MDL. As soon as

practicable after receiving the laboratory report indicating an exceedance of the MDL for PFOA at the midpoint sampling port, a water sample will be collected from the effluent sampling port to document the concentration of regulated PFAS are below 20 ppt. The GAC canisters will then be scheduled for immediate change out as follows:

- Remove the Lead GAC canister.
- Remove the Lag GAC canister and place it in the Lead GAC position.
- Install the replacement GAC canister in the Lag position.
- Spent GAC media will be bulked by Culligan for subsequent shipment to Calgon. GAC media will be accumulated and stored undercover at Culligan's facility until approximately 1 ton of media is accumulated. Pick-up of the bulked media will then be scheduled by Culligan with Calgon. The bulked material will be transported to Calgon's facility for processing.
- Upon return of the Lead GAC canister to Culligan, the GAC media will be evaluated and recorded for indications of biofilm accumulation, and mineral encrustation to determine if "channeling" is occurring within the GAC canister beds. Channeling can reduce the GAC life cycle and is important in determining when a GAC canister should be replaced as discussed in Section 4.4.

4.3 UV Change Out

The UV lamp will be replaced with a new unit or serviced on a 12-month basis.

Depending on the visual condition of the UV quartz sleeve at the time the UV lamp is replaced, it will either be replaced or cleaned. The frequency for cleaning the UV quartz sleeve is dependent upon the hardness of the well water. Culligan will maintain a written record of the water hardness for each POET system from the time of installation, and during each UV system inspection until the POET system is permanently removed. The following establishes the general timeframe for the cleaning of the UV quartz sleeve.

- 0 - 8 gpg (grams per gallon): Every 12 months
- 9 – 14 gpg: Every 6 months
- 15+ gpg: Every 4 months

4.4 Filter Change Out

The pre- and post-polypropylene sediment cartridge filters will be replaced by Culligan every four months. The frequency of filter changes may be modified over time as location specific historical data is developed for each POET system.

4.5 System Data Records

Saint-Gobain will direct its water treatment contractor, Culligan or any subsequent contractors, to keep records of work and modifications made to the POET systems as outlined in this POET OM&M Manual. The contractor will also be directed to provide these records to VTDEC upon request, and to provide the records of an individual property owner to that property owner within one week of a request for such records.

5.0 ONGOING MONITORING AND REPORTING

The sampling activities conducted as part of this POET OM&M Manual will be performed in accordance with the following supporting documents:

- Field Sampling Plan (FSP) dated December 2017, which presents the standard field sampling and data gathering procedures to be followed during implementation of the field activities.
- Quality Assurance Project Plan (QAPP), dated January 2019 or as subsequently updated, which provides project-specific organization details, objectives, data acquisition, data assessment, oversight, data review procedures, and analytical parameters. Protocols for sample collection, handling, storage, chain-of-custody (COC), laboratory and/or field analyses, data evaluation and validation, and reporting are also addressed.
- Project-Specific Health & Safety Plan (PHASP) dated January 2018, which addresses the potential health and safety hazards that may be encountered while performing the work.

5.1 Sample Collection and Analysis

As indicated in Section 3.2, initial system water samples are collected prior to the Lead GAC Canister (influent) and after the Lag GAC canister and analyzed by the laboratory of record for PFAS.

After the completion of the initial system sampling for PFAS (as presented in Section 3.2), the follow-up sampling of the influent and mid-point samples from the POET systems will be performed on the following frequency based on the POET system influent PFOA concentration:

Influent PFOA Concentration ≥ 1,000 ppt:	**Every 3 months**
Influent PFOA Concentration ≥200 ppt to <1000 ppt:	**Every 6 months**
Influent PFOA Concentration <200 ppt:	**Every 12 months**

After a year of system monitoring, inclusive of the initial and first follow-up monitoring event, the above sampling frequency will be reevaluated to determine if it should be modified*. For example: if breakthrough of the Lead GAC canister for a POET system with an influent sample PFOA concentration greater than 1,000 ppt does not occur within the initial year of operation sampling, the sampling frequency may be extended an additional 3 or 6 months.

Regardless of whether there has been breakthrough of the Lead GAC canister after two years of operation, the Lead and Lag GAC canisters will be replaced.

Any change in sampling frequency will be formally submitted to VTDEC for review and approval before making any sampling frequency changes.

5.2 System Sampling

Sampling of the POET systems (influent, mid-point or effluent) are normally collected mid- to late-morning and up until the mid-afternoon, during which time the water has been running and treated for bathing, cooking, washing, flushing, etc. Regardless, the water will be run to waste at a faucet location for approximately 10 minutes prior to the collection of the system samples.

5.3 Periodic Reporting

The results of each monitoring event for each POET system will be provided to VTDEC in accordance with the Consent Order sample reporting and consistent with the data and report submissions provided to date. The results for all POET system sampling events, dating back to the initial set of VTDEC results from the water supply wells, will be provided in a master Excel spreadsheet to VTDEC on an annual basis.

TABLE D1
Addresses at which POETS are Maintained

Table D1
Active POET and POU Treatment Systems in the CAAs*
Bennington, VT
Saint-Gobain Performance Plastics

House #	Street	Town	Installation Date	Most Recent Sample Date
OUA				
96	Apple Hill Rd	Bennington	06/03/2016	6/14/2017
109	Apple Hill Rd	Bennington	06/03/2016	9/14/2018
152	Apple Hill Rd	Bennington	05/27/2016	6/14/2017
273	Apple Hill Rd	Bennington	05/24/2016	6/14/2017
288	Apple Hill Rd	Bennington	05/24/2016	7/29/2019
307	Apple Hill Rd	Bennington	05/27/2016	6/15/2017
333	Apple Hill Rd	Bennington	06/15/2016	7/29/2019
346	Apple Hill Rd	Bennington	05/25/2016	6/14/2017
514	Apple Hill Rd	Bennington	05/25/2016	7/29/2019
531	Apple Hill Rd	Bennington	05/26/2016	6/13/2017
544	Apple Hill Rd	Bennington	05/26/2016	7/29/2019
589	Apple Hill Rd	Bennington	07/14/2017	6/14/2018
685	Apple Hill Rd	Bennington	06/14/2016	8/3/2018
38	Astrachan Dr	Bennington	06/01/2016	12/6/2018
78	Astrachan Dr	Bennington	06/18/2016	8/2/2018
126	Astrachan Dr	Bennington	05/23/2016	7/29/2019
212	Astrachan Dr	Bennington	05/23/2016	7/16/2018
61	Autumn Acres Rd	Bennington	07/19/2016	6/12/2017
68	Autumn Acres Rd	Bennington	07/19/2016	8/2/2018
68	Beaudoin Ln	Bennington	12/02/2016	12/20/2018
113	Beaudoin Ln	Bennington	12/22/2016	12/20/2018
226	Beaudoin Ln	Bennington	12/05/2016	12/20/2018
1182	Becks Dr	Bennington	12/12/2016	3/6/2019
1400	Becks Dr	Bennington	06/15/2016	7/16/2018
1	Carpenter Ln	Bennington	06/14/2016	6/14/2018
32	Cortland Ln	Bennington	06/01/2016	8/2/2018
54	Cortland Ln	Bennington	06/01/2016	8/2/2018
150	Cortland Ln	Bennington	06/01/2016	8/2/2018
1366	East Rd	Bennington	06/14/2016	8/2/2018
155	Harwood Hill Rd	Bennington	06/28/2017	10/3/2017
162	Harwood Hill Rd	Bennington	07/09/2018	7/23/2018
563	Harwood Hill Rd	Bennington	08/11/2016	9/12/2018
583	Harwood Hill Rd	Bennington	08/11/2016	9/12/2018
782	Harwood Hill Rd	Bennington	10/31/2016	3/6/2019
864	Harwood Hill Rd	Bennington	06/29/2016	7/16/2018
1042	Harwood Hill Rd	Bennington	09/26/2016	10/27/2017
1079	Harwood Hill Rd	Bennington	09/23/2016	5/31/2018
1124	Harwood Hill Rd	Bennington	06/14/2016	10/27/2017
1152	Harwood Hill Rd	Bennington	06/09/2016	7/16/2018
1169	Harwood Hill Rd	Bennington	06/08/2016	10/4/2018
1198	Harwood Hill Rd	Bennington	06/09/2016	7/16/2018
1264	Harwood Hill Rd	Bennington	06/22/2016	7/16/2018
1267	Harwood Hill Rd	Bennington	10/10/2016	1/23/2018
1286	Harwood Hill Rd	Bennington	06/22/2016	8/10/2018
1361	Harwood Hill Rd	Bennington	11/18/2016	8/29/2017
1371	Harwood Hill Rd	Bennington	11/17/2016	5/31/2018
1411	Harwood Hill Rd	Bennington	06/06/2016	7/16/2018
1487	Harwood Hill Rd	Bennington	07/05/2016	6/7/2018
1709	Harwood Hill Rd	Bennington	12/05/2016	12/20/2018
1803	Harwood Hill Rd	Bennington	07/01/2017	10/12/2017
1869	Harwood Hill Rd, Sunset Farms MHP (POU)	Bennington	03/11/2019	--

Table D1
Active POET and POU Treatment Systems in the CAAs*
Bennington, VT
Saint-Gobain Performance Plastics

House #	Street	Town	Installation Date	Most Recent Sample Date
1905	Harwood Hill Rd	Bennington	07/21/2017	4/15/2019
50	Houghton Ln	Bennington	06/14/2016	10/4/2018
286	Houghton Ln	Bennington	06/30/2016	9/12/2018
397	Houghton Ln	Bennington	05/31/2016	6/27/2019
404	Houghton Ln	Bennington	08/25/2016	9/12/2018
55	McIntosh Ln	Bennington	06/08/2016	9/14/2018
70	McIntosh Ln	Bennington	06/09/2016	8/2/2018
105	McIntosh Ln	Bennington	07/08/2016	8/2/2018
112	McIntosh Ln	Bennington	12/26/2018	1/24/2019
118	McIntosh Ln	Bennington	06/07/2016	8/2/2018
121	McIntosh Ln	Bennington	06/23/2016	8/22/2018
36	Michaels Dr	Bennington	06/06/2016	9/12/2018
49	Michaels Dr	Bennington	06/06/2016	3/29/2018
66	Michaels Dr	Bennington	06/05/2016	9/12/2018
105	Michaels Dr	Bennington	06/05/2016	8/2/2018
108	Michaels Dr	Bennington	05/28/2016	6/13/2017
137	Michaels Dr	Bennington	04/19/2016	5/31/2018
175	Michaels Dr	Bennington	06/05/2016	8/27/2018
182	Michaels Dr	Bennington	06/05/2016	6/27/2019
189	Michaels Dr	Bennington	06/06/2016	8/2/2018
190	Michaels Dr	Bennington	06/14/2016	6/27/2019
210	Michaels Dr	Bennington	06/22/2016	8/2/2018
21	Russett Dr	Bennington	06/02/2016	8/22/2018
22	Russett Dr	Bennington	01/07/2019	4/17/2019
60	Russett Dr	Bennington	06/15/2016	9/14/2018
85	Russett Dr	Bennington	06/02/2016	8/2/2018
93	Russett Dr	Bennington	06/02/2016	8/3/2018
112	Russett Dr	Bennington	06/02/2016	8/22/2018
133	Russett Dr	Bennington	06/02/2016	9/14/2018
140	Russett Dr	Bennington	04/14/2017	6/14/2018
13	Settlers Rd	Bennington	06/22/2016	8/2/2018
59	Settlers Rd	Bennington	08/02/2016	9/12/2018
78	Squaw Hill Rd	Bennington	06/10/2016	7/8/2016
251	Squaw Hill Rd	Bennington	06/10/2016	10/4/2018
2	Sunset Farms MHP (POU)	Bennington	03/12/2019	--
6	Sunset Farms MHP (POU)	Bennington	03/11/2019	3/26/2019
9	Sunset Farms MHP (POU)	Bennington	03/11/2019	3/26/2019
10	Sunset Farms MHP (POU)	Bennington	03/11/2019	--
11	Sunset Farms MHP (POU)	Bennington	03/11/2019	--
12	Sunset Farms MHP (POU)	Bennington	03/14/2019	7/30/2019
14	Sunset Farms MHP (POU)	Bennington	03/14/2019	7/30/2019
82	Transport Dr	Bennington	07/06/2016	8/10/2018
412	Willow Rd	Bennington	05/25/2016	5/31/2018
561	Willow Rd	Bennington	05/25/2016	6/27/2019
593	Willow Rd	Bennington	08/26/2016	9/12/2018
685	Willow Rd	Bennington	06/08/2016	6/27/2019
713	Willow Rd	Bennington	06/08/2016	10/4/2018
722	Willow Rd	Bennington	06/04/2016	6/27/2019
737	Willow Rd	Bennington	06/04/2016	6/13/2017

Table D1
Active POET and POU Treatment Systems in the CAAs*
Bennington, VT
Saint-Gobain Performance Plastics

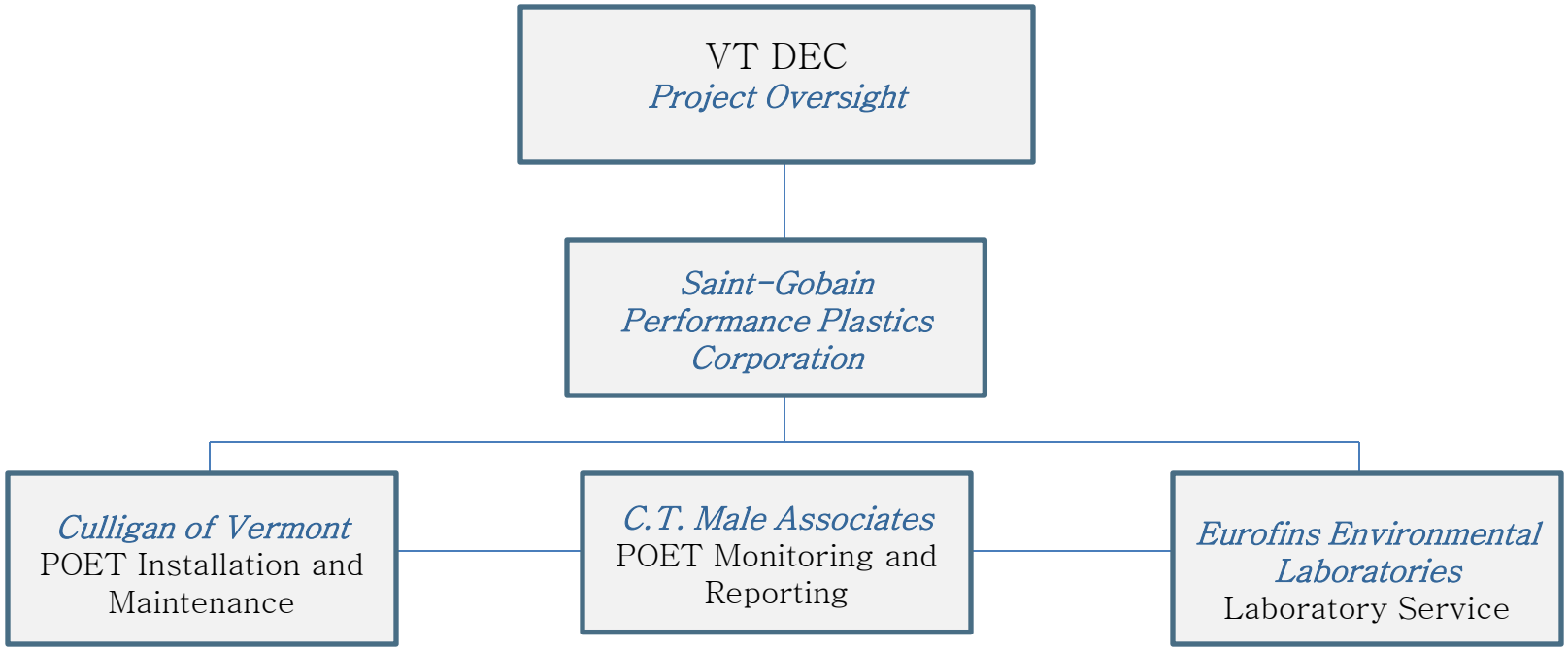
House #	Street	Town	Installation Date	Most Recent Sample Date
OUB				
162	East Rd	Shaftsbury	07/20/2017	6/14/2018
1747	East Rd	Bennington	11/15/2016	5/31/2018
276	Fairview St	Bennington	05/18/2016	12/12/2018
69	Gulley Ln	Bennington	10/02/2016	6/17/2019
91	Gulley Ln	Bennington	09/29/2016	6/17/2019
169	Harrington Rd	Shaftsbury	09/29/2016	11/9/2016
761	Harrington Rd	Bennington	04/08/2016	7/8/2019
1278	Harrington Rd	Bennington	12/04/2018	7/2/2019
1682	Harrington Rd	Bennington	04/08/2016	6/25/2019
1731	Harrington Rd	Bennington	06/23/2017	12/12/2018
748	Harvest Hills Dr	Shaftsbury	06/18/2018	8/16/2019
1688	Harwood Hill Rd (POU)	Bennington	09/28/2017	10/18/2017
1279	Houghton Ln	Bennington	05/23/2016	5/31/2018
514	Ore Bed Rd	Bennington	03/30/2016	7/2/2019
995	Ore Bed Rd	Bennington	Request from Culligan, sometime September 2019	8/2/2019
1075	Ore Bed Rd	Bennington	11/28/2018	8/16/2019
554	Overlea Rd (POU)	Bennington	08/16/2018	5/1/2018
570	Overlea Rd	Bennington	11/10/2016	6/17/2019
802	Overlea Rd	Bennington	06/23/2017	2/12/2019
286	Rice Ln	Bennington	08/11/2016	6/20/2019
1661	River Rd	Bennington	12/03/2018	7/2/2019
632	Rocky Ln	Bennington	09/06/2016	10/4/2018
801	Rocky Ln	Bennington	05/13/2019	5/13/2019
1102	Rocky Ln	Bennington	06/01/2016	3/28/2018
88	Settlers Rd	Bennington	07/01/2016	8/10/2018
213	Settlers Rd	Bennington	07/20/2016	4/17/2019
264	Spring Hill Rd	Bennington	11/18/2016	5/31/2018
380	Spring Hill Rd	Bennington	06/29/2016	10/12/2017
190	Town Line Rd	Bennington	12/21/2018	1/24/2019
498	Town Line Rd	Shaftsbury	08/12/2016	9/12/2018
592	Town Line Rd	Shaftsbury	06/19/2017	6/20/2019
1214	Vail Rd	Bennington	01/02/2019	8/16/2019
1302	Vail Rd	Bennington	05/13/2019	6/17/2019
471	Vt Route 67 W	Shaftsbury	04/09/2016	12/12/2018
662	Vt Route 67 W	Shaftsbury	04/20/2016	6/19/2019
1170	Vt Route 67 W	Shaftsbury	06/27/2017	12/12/2018

Notes:

* List subject to change in consultation with VTDEC
--: No Data
MHP: Mobile Home Park
POET: Point-of-Entry Treatment
POU: Point-of-Use
OUA: Operable Unit A
OUB: Operable Unit B

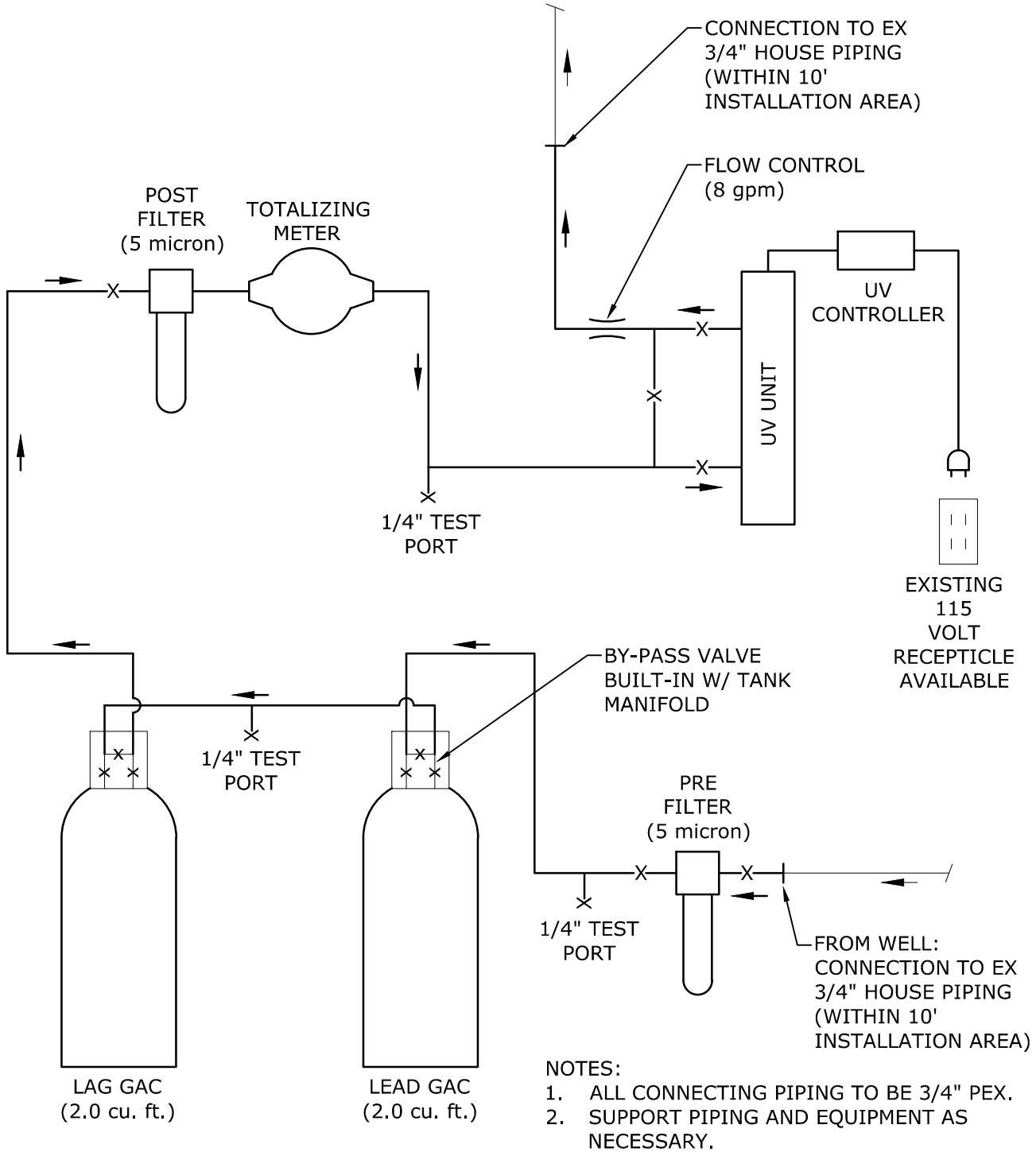
APPENDIX A
PROJECT ORGANIZATION

TABLE 1 – PROJECT ORGANIZATION



APPENDIX B
POET SYSTEM INSTALLATION SCHEMATIC

NONE :XREFS



NOTES:
1. ALL CONNECTING PIPING TO BE 3/4" PEX.
2. SUPPORT PIPING AND EQUIPMENT AS NECESSARY.

Date	RECORD OF WORK	Appr.

Drafter: DLP	Checker: DPR
Appr. by: DPR	Proj. No. 16.6131

SCHEMATIC
TYPICAL GAC POET SYSTEM
VARIOUS RESIDENTIAL / COMMERCIAL LOCATIONS

BENNINGTON AREA	VERMONT

C.T. MALE ASSOCIATES
Engineering, Surveying, Architecture & Landscape Architecture, D.P.C.
50 CENTURY HILL DRIVE, LATHAM, NY 12110
518.786.7400 * FAX 518.786.7299

SCALE: NONE	DATE: MAR 15, 2016

CAD DWG. FILE NAME: K:\Projects\166131\Civil\schematic.dwg

APPENDIX C
POET INSTALLATION AND OPERATIONS MANUAL (CULLIGAN)

Installation and Operation Manual

Exchange Carbon Filter System

Contents

Overview

This Portable Exchange Carbon Filtration System is designed to be installed in residential applications for the reduction of traces of organic chemical contamination from well water supplies. The system provides maximum flow rate of up to 8 GPM and includes a cartridge type sediment pre-filter (Dual Gradient 50-5 micron), a dual Carbon Filter system containing a total of 4 Ft^3 of a Filtrasorb F600AW Bituminous Coal Acid Washed Granular Activated Carbon (Culligan Cullar F600AW), cartridge type sediment post-filter (Dual Gradient 50-5 micron) and a final UV Light Water Sterilizer rated at 8 GPM flow rate. The system incorporates test ports in the inlet, in between the two carbon vessels and at the outlet of the system for monitoring the system efficiency. Also, a water totalizing meter is included in the outlet of the system to record water usage and facilitate service monitoring.

System Design – Typical Operation

System is installed on the main water line of the residence after the well pressure tank as indicated in the system flow diagram (Fig. 1) below. The first sediment filter is used for the removal of sediments and suspended matter. Then water flows through two (2) 10"x54" vessels in series each containing 2.0 Ft^3 of the Cullar F600AW (#SPC10776) Granular Activated Carbon media for the adsorption of traces of organic contaminants. The dual filter approach provides for a continuous back contingency. Following the carbon filter vessels a secondary cartridge type sediment filter is utilized to provide clean water to the residence. Finally, a UV light water sterilization unit is providing microbiological control prior to distribution of the water to the household.

The system operation is designed to be simple and maintenance free. Periodic exchange of the carbon filters is performed by your local Culligan dealer. Sampling ports are included during the installation to facilitate testing the system efficacy and determine when the carbon filter(s) need to be replaced. The spent carbon should be disposed according to applicable local and federal requirements as it may contain the contaminants being removed in the process and has to be treated accordingly.

Refer to this manual for further details and instructions for the system components.

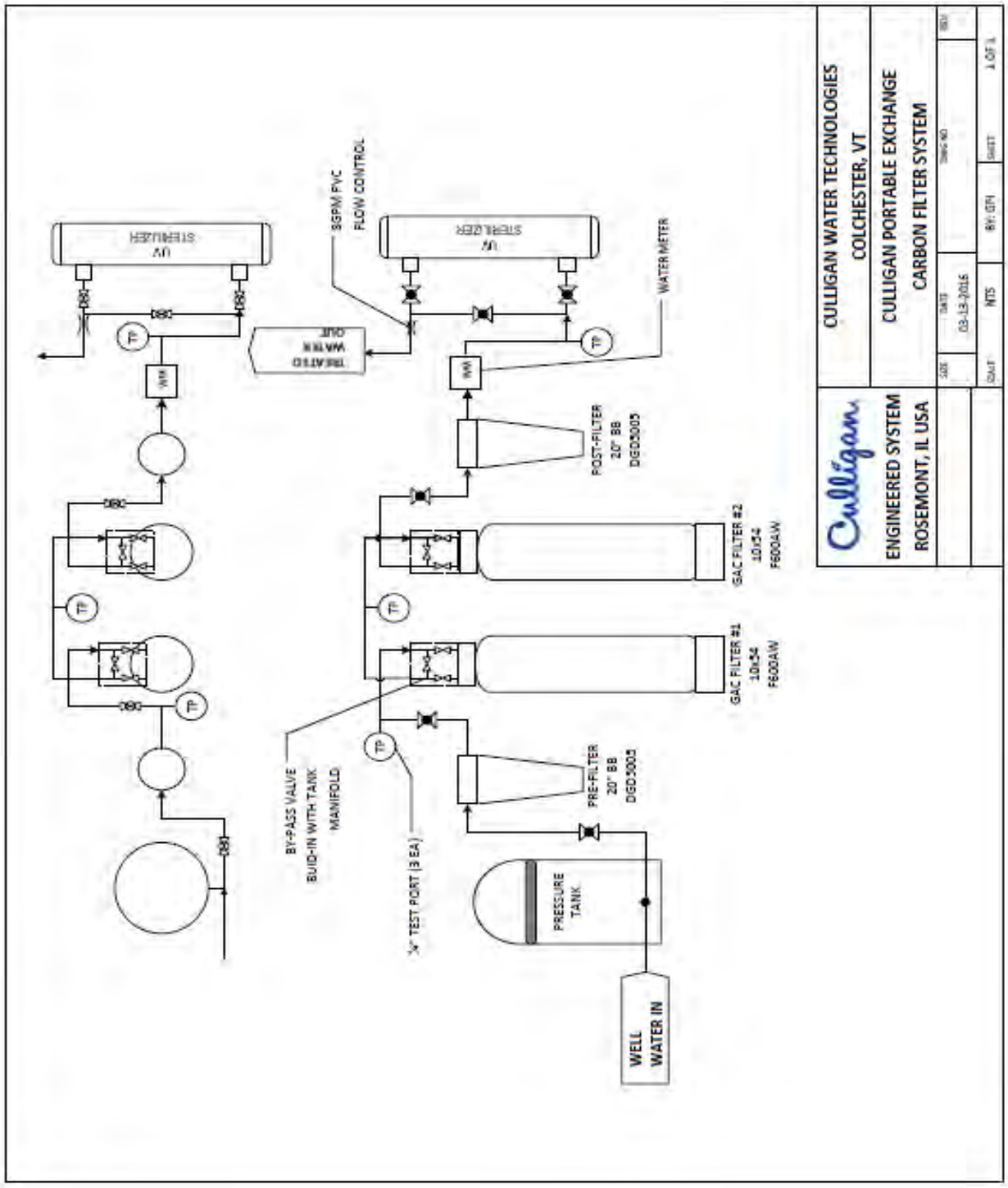


Figure 1: System Flow Diagram

PORTABLE EXCHANGE CARBON FILTERS

FILLING AND START UP PROCEEDURES

The following procedures should be followed every time a new Portable Exchange carbon filter is installed or exchange for an application. Every filter needs to be prepared according to the following instructions before it is placed in service.

I. FILLING PROCEEDURES:

1. Insert the Outlet distributor manifold in the tank and make sure it is properly centered
2. Cover the opening of the manifold with a clean rag.
3. Place a wide-mouth funnel in the tank opening.
4. Open one (1) 55 lbs. bag of Filtrasorb F600AW carbon. Slowly pour the carbon into the tank via the funnel. Fill the carbon within 2" – 3" from the top. Each tank depending on the size used should take 2 Ft^3 of carbon.
5. Fill the tank with water and allow the media to soak for 24-48 hours. The water level in the tank will decrease as the media soaks up water. Add water to the tank to keep the media submerged so all the media gets saturated.
6. Thread the tank closure with the inlet strainer into the tank; be careful not to miss thread.

II. RECOMMENDED START UP PROCEDURE:

1. It is advisable that every new filter is backwashed for 10 - 15 minutes at a flow rate of 5 – 8 GPM.
2. Easiest way to backwash the PE Carbon Tanks is utilizing a backwash funnel assembly, usually installed in a Culligan dealership. Backwash the media in the funnel for 10-15 minutes to make sure water is clean and all carbon fines are washed out.
3. Drop media back in the tank, drain excess water. Unit is ready to set in service.
4. If a backwash funnel is not available reverse the flow of the water on the tank manifold. Flow backwards to drain for 10-15 minutes at a flow rate no more than 5 GPM. If flow starts diminishing is because media is lifted around the top manifold. After 10-15 minutes make sure that the water to drain comes out clear. Reverse the flow and run to drain for another 5 min at 5 GPM to settle the bed.
5. You are ready to place the unit to service.
6. When installing the unit make sure that the Inlet & Outlet are hooked up correctly.

For servicing of the system contact the Culligan Dealer in your area.

Portable Exchange Carbon Filtration
Specifications and Operating Data

Cullar Portable Exchange Carbon Unit – 10x54 FRP Tank, 2.0 Ft³

The 10"x54"-CARB FRP 1" will Provide:

Superior Quality Flow, gpm	: 3.1 @ 2 psi loss
High Quality Flow, gpm	: 4.7 @ 4 psi loss
Utility Quality Flow, gpm	: 6.3 @ 6 psi loss
Carbon Volume, ft³	: 2.0

Miscellaneous Design Data:

Tank Size, in.	: 10x54
Tank Area, ft²	: 0.54
Operating Pressure, psi	: 0-150
Oper. Temperature, °F	: 33-120

The 10"-CARB FRP 1" System Requirements:

Voltage	: None*
Pipe Conn, in NPT...	
Inlet	: 1.0
Outlet	: 1.0
Weight per tank, lbs...	
Shipping	: 132.0
Operating	: 195.0
Overall Dimensions, in....	
Width	: 11.0
Depth	: 12.0
Height	: 56.0

* Note: Voltage may be required for water quality instruments.

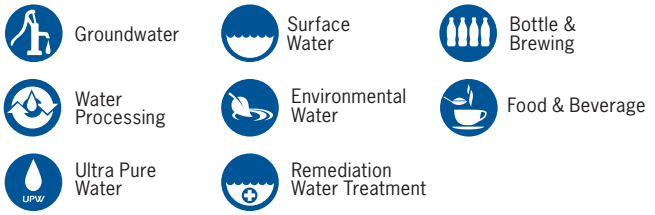
Cullar – Filtrasorb F600AW Activated Carbon Media:

The Filtrasorb F600AW media is a granular activated carbon for the removal of dissolved organic compounds from water. Such contaminants include taste and odor compounds, organic color, Total organic Carbon (TOC), and industrial organic compounds such as TCE, PCE and others. The F600AW is made of selected grades of bituminous coal and it is acid wash to provide cleanliness. See attached factory data sheet for more details.

FILTRASORB® 600

Granular Activated Carbon

Applications



With its enhanced high energy pore structure, FILTRASORB 600 is ideally suited for trace removal applications and offers a significant performance advantage over traditional activated carbon products used in these types of applications.

Specific applications include:

- Removal of MTBE
- Removal of DBCP
- Removal of THMs
- Removal of pesticides and herbicides
- Removal of other organics at concentrations < 1 ppm
- Potable water treatment
- Groundwater treatment
- Ultrapure water treatment

Description

FILTRASORB 600 is a granular activated carbon for the removal of dissolved organic compounds from water and wastewater as well as industrial and food processing streams. These contaminants include taste and odor compounds, organic color, total organic carbon (TOC), and industrial organic compounds such as TCE and PCE.

This activated carbon is made from select grades of bituminous coal through a process known as reagglomeration to produce a high activity, durable, granular product capable of withstanding the abrasion associated with repeated backwashing, hydraulic transport, and reactivation for reuse. Activation is carefully controlled to produce a significant volume of both low and high energy pores for effective adsorption of a broad range of high and low molecular weight organic contaminants.

FILTRASORB 600 is formulated to comply with all the applicable provisions of the AWWA Standard for Granular Activated Carbon (B604) and Food Chemicals Codex. This product may also be certified to the requirements of ANSI/NSF Standard 61 for use in municipal water treatment facilities. Only products bearing the NSF Mark are certified to the NSF/ANSI 61 - Drinking Water System Components - Health Effects standard. Certified Products will bear the NSF Mark on packaging or documentation shipped with the product.

Features / Benefits

- Produced from a pulverized blend of high quality bituminous coals resulting in a consistent, high quality product.
- Carbon granules are uniformly activated through the whole granule, not just the outside, resulting in excellent adsorption properties and constant adsorption kinetics.
- The reagglomerated structure ensures proper wetting while also eliminating floating material.
- High mechanical strength relative to other raw materials, thereby reducing the generation of fines during backwashing and hydraulic transport.
- Carbon bed segregation is retained after repeated backwashing, ensuring the adsorption profile remains unchanged and therefore maximizing the bed life.
- Reagglomerated with a high abrasion resistance, which provides excellent reactivation performance.
- High density carbon resulting in a greater adsorption capacity per unit volume.

Specifications[1]	FILTRASORB 600
Iodine Number, mg/g	850 (min)
Moisture by Weight	2% (max)
Abrasion Number	80 (min)
Trace Capacity Number, mg/g	16 (min)
Screen Size by Weight, US Sieve Series	
On 12 mesh	5% (max)
Through 40 mesh	4% (max)

[1]Calgon Carbon test method

Typical Properties*	FILTRASORB 600
Apparent Density (tamped)	0.62 g/cc
Water Extractables	<1%
Non-Wettable	<1%

*For general information only, not to be used as purchase specifications.

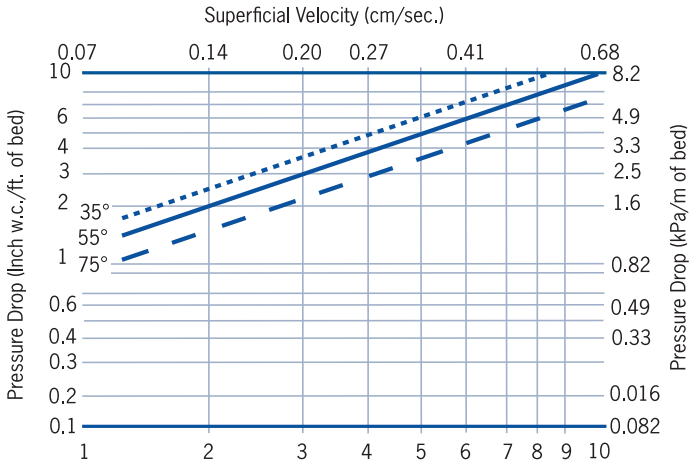
Safety Message

Wet activated carbon can deplete oxygen from air in enclosed spaces. If use in an enclosed space is required, procedures for work in an oxygen deficient environment should be followed.

DS-FILTRA60015-EIN-E1

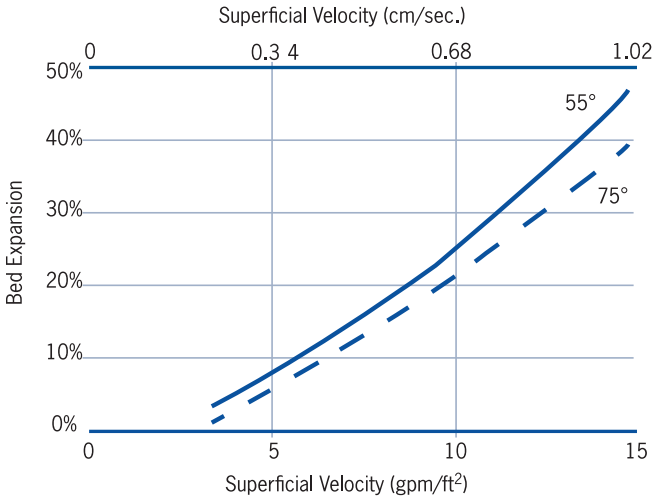
Typical Pressure Drop

Based on a backwashed and segregated bed



Typical Bed Expansion During Backwash

Based on a backwashed and segregated bed



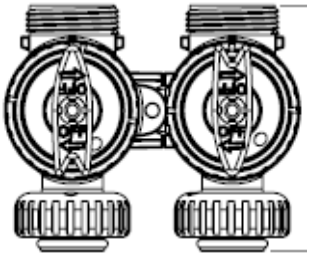
Safety Message

Wet activated carbon can deplete oxygen from air in enclosed spaces. If use in an enclosed space is required, procedures for work in an oxygen deficient environment should be followed.

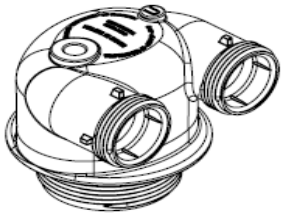
1.800.4CARBON calgoncarbon.com

DS-FILTRA60015-EIN-E1

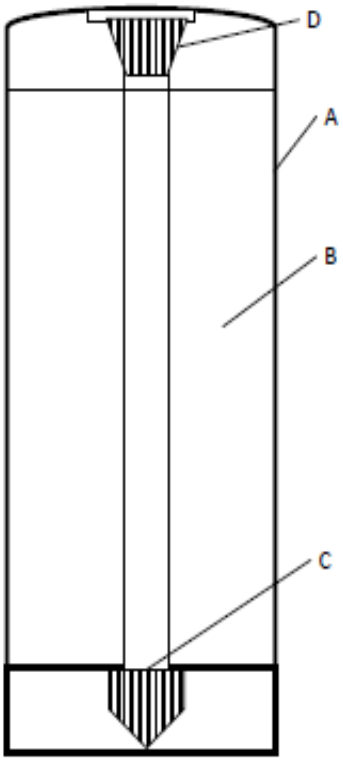
Carbon Filter Component Parts:



By-Pass Valve WS1 (#SPC10762)



In & Out Tank Head (#SPC10761)



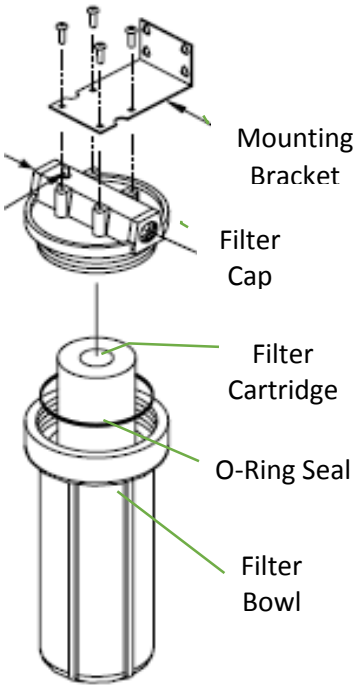
A. Filter Tank, FRP, 10”x54” (#SPC10770)

B. Carbon Media, 2 Ft^3, Cullar F600AW (#SPC10776)

C. Distributor Manifold (#SPC10773)

D. Top Distributor Basket (#SPC10765)

Filter Cartridge Replacement Procedures



The pre and post filter cartridges need to be replaced when a significant pressure drop across the filter increases, or in a regular intervals as determine by local water conditions.

1. Turn off water supply to filter. Depress red pressure-relief button to relief the pressure from the filter.
2. Using the filter wrench provided (#MS010522), unscrew the filter bowl.
3. Remove and discard old filter cartridge.
4. Clean the filter bowl with a damp cloth and rinse thoroughly.
5. Remove the wrapper from the new cartridge (#MS004512). Install the cartridge in the bowl, making sure it seals in the bottom of the bowl.
6. Check the O-ring seal (#MS404498) for dryness and cuts. Replace the seal if necessary and use silicone lube as needed.

   CAUTION! Do not use petroleum-based lubricants, which destroy the synthetic rubber seal.

7. Screw the filter bowl onto the filter cap and hand tighten. DO NOT OVER-TIGHTEN.
8. Slowly turn on the water supply to allow filter to fill with water and then press the red pressure-relief button on top of the filter cap to release trapped air.

UV Sterilizer # S8Q-PA-C (#D1022214)

Models:

S2Q-PA, S5Q-PA, S8Q-PA, S2Q-P/12VDC, S5Q-P/12VDC

NSF Standard 55 Class B Validated Models:

SV5Q-PA, SV8Q-PA

Powered by Sterilight

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t. (+31) 73 747 0144 (Europe only) • f. (+1) 519.763.5069
e-mail: info@viqua.com
www.viqua.com

MEMBER Water Quality ASSOCIATION

Section 1 Safety Information

These are the original instructions. Please read this entire manual before operating this equipment. Pay attention to all danger, warning, and caution statements in this manual. Failure to do so could result in serious personal injury or damage to the equipment.

Make sure that the protection provided by this equipment is not impaired. DO NOT use or install this equipment in any manner other than that specified in the installation manual.

1.1 Potential Hazards:

Read all labels and tags attached to the system. Personal injury or damage to the system could occur if not observed.

	Waste electrical and electronic equipment (WEEE). This symbol indicates that you should not discard wasted electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.		This symbol indicates not to store any combustible or flammable material close to the system.
	This symbol indicates there is Mercury present.		This symbol indicates that the contents of the transport package are fragile and the package should be handled with care.
	This is the safety alert symbol. Obey all safety messages that follow this symbol to avoid potential injury. When on the equipment, refer to the Operational and Maintenance manual for additional safety information.		This symbol indicates safety glasses with side protection is required for protection against UV exposure.
	This symbol indicates a risk of electrical shock and/or electrocution exists.		This symbol indicates gloves must be worn.
	This symbol indicates the marked equipment may contain a component that can eject forcibly. Obey all procedures to safely depressurize.		This symbol indicates safety boots must be worn.
	This symbol indicates the system is under pressure.		This symbol indicates the operator must read all available documentation to perform required procedures.
	This symbol indicates there is a potential UV hazard. Proper protection must be worn.		This symbol indicates the plumber must use copper piping.
	This symbol indicates the marked item could be hot and should not be touched without care.		This symbol indicates that the system should only be connected to a properly grounded, grounding-type controller receptacle that is protected by a Ground Fault Circuit Interrupter (GFCI).
	This symbol indicates there is a potential for VERY hot water when flow is started.		

Warning: This product may contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

1.2 Safety Precautions:

⚠DANGER

Failure to follow these instructions will result in serious injury or death.

- **Electric Shock:** To avoid possible electric shock, special care should be taken since water is present near the electrical equipment. Unless a situation is encountered that is explicitly addressed by the provided maintenance and troubleshooting sections, DO NOT attempt repairs yourself, refer to an authorized service facility.
- **GROUNDING:** This product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electrical shock. This system is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances. Improper connection of the equipment-grounding conductor can result in a risk of electrocution. Check with a qualified electrician or service personnel if you are in doubt as to whether the outlet is properly grounded. DO NOT modify the plug provided with this system – if it does not fit in the outlet, have a proper outlet installed by a qualified electrician. DO NOT use any type of adapter with this system.
- **GROUND FAULT CIRCUIT INTERRUPTER PROTECTION**: To comply with the National Electrical Code (NFPA 70) and to provide additional protection from the risk of electric shock, this system should only be connected to a properly grounded, grounding-type controller receptacle that is protected by a Ground Fault Circuit Interrupter (GFCI) or to a residual current device (RCD) having a rated residual operating current not exceeding 30 mA. Inspect operation of GFCI as per manufacturer's suggested maintenance schedule.
- DO NOT operate the disinfection system if it has a damaged cord or plug, if it is malfunctioning or if it has been dropped or damaged in any manner.
- DO NOT use this disinfection system for other than intended use (potable water applications). The use of attachments not recommended or sold by the manufacturer / distributor may cause an unsafe condition.
- DO NOT install this disinfection system where it will be exposed to the weather or to temperatures below freezing.
- DO NOT store this disinfection system where it will be exposed to the weather.
- DO NOT store this disinfection system where it will be exposed to temperatures below freezing unless all water has been drained from it and the water supply has been disconnected.

⚠ WARNING

- During extended periods of no water flow, the water in your chamber can become very hot (Approx. 60 °C) and potentially lead to scalding. It is recommended to run your water until this hot water has been purged from your chamber. Do not allow water to contact your skin during this time. To eliminate this condition, a temperature management valve can be installed at the outlet of your UV system.
- This system contains a UV Lamp. Do not operate the UV Lamp when it is removed from the chamber. Unintended use or damage of the system may result in the exposure of dangerous UV radiation. UV radiation may, even in little doses, cause harm to the eyes and skin.
- Changes or modifications made to this system without the consent of the manufacturer could render the system unsafe for operation and may void the manufacturer's warranty.

⚠ CAUTION

Failure to follow these instructions could result in minor or moderate injury.

- Carefully examine the disinfection system after installation. It should not be plugged in if there is water on parts not intended to be wet such as, the controller or lamp connector.
- Due to thermal expansion concerns and potential material degradation due to UV exposure, it is recommended to use metal fittings and at least 10" of copper pipe on the outlet of your UV chamber.
- **Hg EXPOSURE**: The UV lamp contains mercury. If the lamp breaks, then avoid inhalation or ingestion of the debris and avoid exposure to eyes and skin. Never use a vacuum cleaner to clean up a broken lamp as this may scatter the spilled mercury. Obey local regulations and guidelines for the removal and disposal of mercury waste.

NOTICE

- The UV lamp inside the disinfection system is rated at an effective life of approximately 9000 hours. To ensure continuous protection, replace the UV lamp annually.
- The UV system is not to be used or played with by children. Persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, are also not to handle the UV system unless they have been given supervision or instruction.
- This system is intended to be permanently connected to the water lines.
- This system is not intended to be used in or above water or outdoors or used in swimming pools when persons are in the pool.
- **EXTENSION CORDS**: If an extension cord is necessary, use only 3-wire extension cords that have 3-prong grounding-type plugs and 3-pole cord connectors that accept the plug from this system. Use only extension cords that are intended for outdoor use. Use only extension cords having an electrical rating not less than the rating of the system. A cord rated for less amperes or watts than this system rating may overheat. Exercise caution when arranging the cord so that it will not be tripped over or pulled. DO NOT use damaged extension cords. Examine extension cord before using and replace if damaged. DO NOT abuse extension cord. Keep extension cord away from heat and sharp edges. Always disconnect the extension cord from the receptacle before disconnecting this system from the extension cord. Never yank cord to pull plug from outlet. Always grasp the plug and pull to disconnect.
- If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.
- **SYSTEM PROTECTION:** To protect your Controller, a UL1449 certified (or equivalent) transient voltage surge suppressor is strongly recommended.
- The UV lamp in this system conforms to the applicable provisions of the Code of Federal Regulations (CFR) requirements including, Title 21, Chapter 1, Subchapter J, Radiological Health.
- Read and understand the Owner's Manual before operating and performing any maintenance on this equipment.

1.3 Water Chemistry

Water quality is extremely important for the optimum performance of your UV system. The following levels are recommended for installation:

Water Quality and Minerals	Level
Iron	< 0.3 ppm (0.3 mg/L)
Hardness*	< 7 gpg (120 mg/L)
Turbidity	< 1 NTU
Manganese	< 0.05 ppm (0.05 mg/L)
Tannins	< 0.1 ppm (0.1 mg/L)
UV Transmittance	> 75% (call factory for recommendations on applications where UVT < 75%)

* Where total hardness is less than 7 gpg, the UV unit should operate efficiently provided the quartz sleeve is cleaned periodically. If total hardness exceeds 7 gpg, the water should be softened. If your water chemistry contains levels in excess of those mentioned above, proper pre-treatment is recommended to correct these water problems prior to the installation of your UV disinfection system. These water quality parameters can be tested by your local dealer, or by most private analytical laboratories. *Proper pre-treatment is essential for the UV disinfection system to operate as intended*.

Section 2 General Information

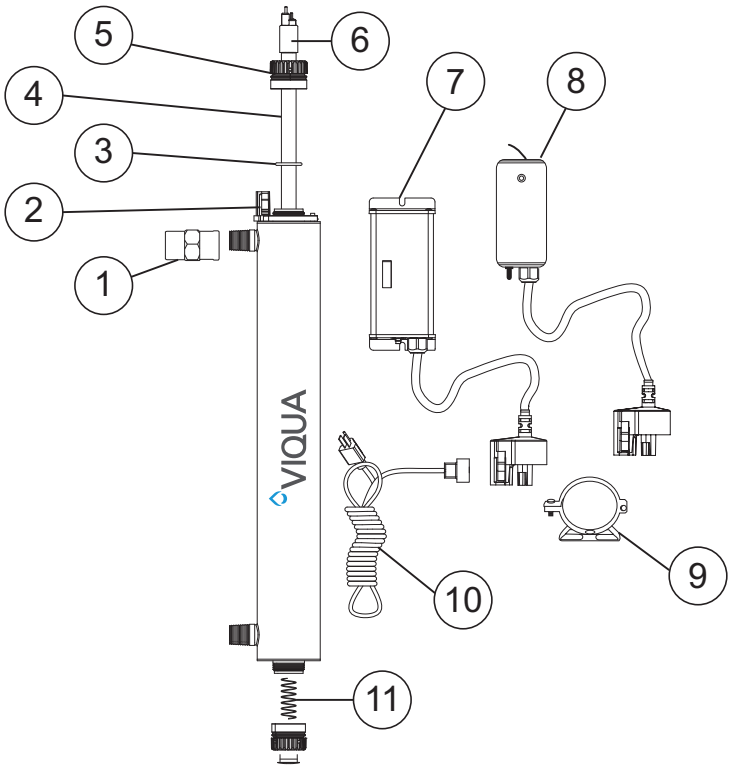


Figure 1 System Components

Item	Description	Part Number	UV Systems
1	Flow restrictor (Only for certified models)	440263-R	SV5Q-PA
		440264-R	SV8Q-PA
2	Lamp connector base	270276-R	Used on all systems
3	O-ring	410867	Used on all systems
4	Open-ended, 214 fused quartz sleeves with fire polished ends	QS-001	S1Q-PA
		QS-330	S2Q-PA
		QS-463	S5Q-PA, SV5Q-PA
		QS-810	S8Q-PA, SV8Q-PA
5	Retaining nut	RN-001	Used on all systems
6	Hard glass, coated Sterilumze®-EX UV lamps for long, consistent life (9000 hours)	S330RL	S2Q-PA
		S463RL	S5Q-PA, SV5Q-PA
		S810RL	S8Q-PA, SV8Q-PA
7	Controller (for 100-240V models only)	BA-ICE-S	S5Q-PA, S8Q-PA, SV5Q-PA, SV8Q-PA
8	Controller (for 12VDC models only)	BA-RO/P/12	S2Q-P/12VDC, S5Q-P/12VDC
9	2.5” Mounting brackets	410958-R	Used on all systems
10	IEC replacement power cords for VIQUA ICE Controller (sold separately)	260010	NORTH AMERICAN (NEMA 5-15P), 3-PRONG GROUNDED
		602637	CONTINENTAL EUROPEAN (CEE 7/7) 2-PIN WITH GROUND, “SCHUKO”
		260012	UK VERSION (BS 1363) 3-PRONG GROUNDED (5 AMP FUSE)
		260013	AUSTRALIAN VERSION (AS 3112) 3-PRONG GROUNDED
		260019	NO CONNECTOR, 3-WIRE, BARE LEADS
11	Spring	SP008	Used on all systems

Section 3 Installation

3.1 UV Disinfection System

⚠CAUTION

⚠ Electronic controller must be connected to a Ground Fault Protected Circuit (GFCI) receptacle. Ensure green ground wire ring terminal is securely fastened to ground stud on UV chamber.

The disinfection system is designed to be mounted either horizontally or vertically at the point-of-use or point-of-entry depending on the specific flow rate of the unit.

Note: *The ideal installation is vertical with the lamp connector on top. This is to prevent water damage from occurring on the lamp pins and lamp connector.*

- The controller should be mounted either above or beside the UV chamber. Always mount controller horizontally to prevent moisture from running down cordage and causing a potential fire hazard. Drip loops in all cordage connected to controller is highly recommended. Refer to Figure 5.
- The complete water system, including any pressure or hot water tanks, must be sterilized before start up by flushing with chlorine (household bleach) to destroy any residual contamination. Refer to Section 3.2.
- The disinfection system is intended for indoor use only. DO NOT install disinfection system where it may be exposed to the weather.
- Install the disinfection system on cold water line only, before any branched lines.
- A 5 micron sediment filter must precede the disinfection system. Ideally, the disinfection system should be the last treatment the water receives before it reaches the faucet.

Procedure:

1. Figure 2 shows the installation of a typical disinfection system and the related components that may be used for the installation. The use of a by-pass assembly is recommended in case the system requires “off-line” maintenance. In this case, note the system requires supplementary disinfection for the distribution system if any water is used during by-pass condition. In addition, during by-pass, the water will NOT be disinfected and a “DO NOT CONSUME THE WATER” tag should be physically installed on the by-pass assembly until such time as the system is sanitized and returned to service. For more information, refer to Section 3.2. If the water is to be consumed while the system is off-line, the water must be boiled for two minutes prior to consumption.

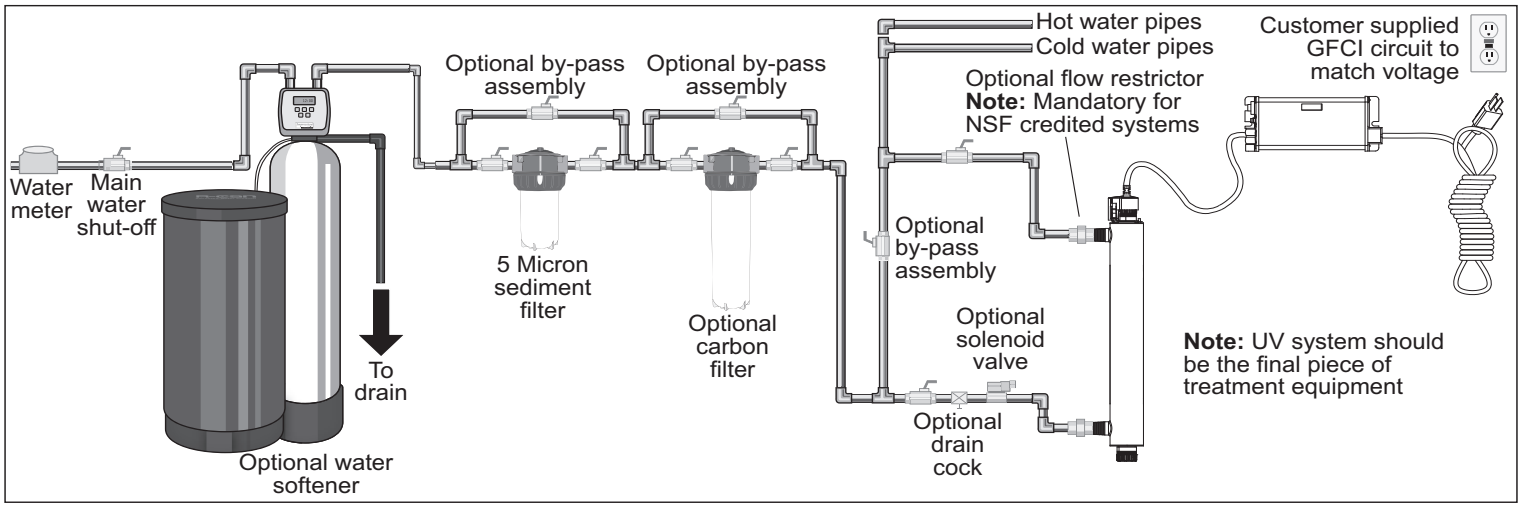


Figure 2 Disinfection System

2. Select a suitable location for the disinfection system and its related components. As it is recommended to install a GFCI, make sure that this is taken into consideration prior to any installation. The system can either be installed vertically (inlet port at the bottom) as shown in Figure 3 A, or horizontally as shown in Figure 3 B. However, the vertical installation is the most preferred method. When selecting a mounting location, leave enough space to allow the removal of the UV lamp and/or quartz sleeve (typically leave a space equal to the size of the UV chamber itself).

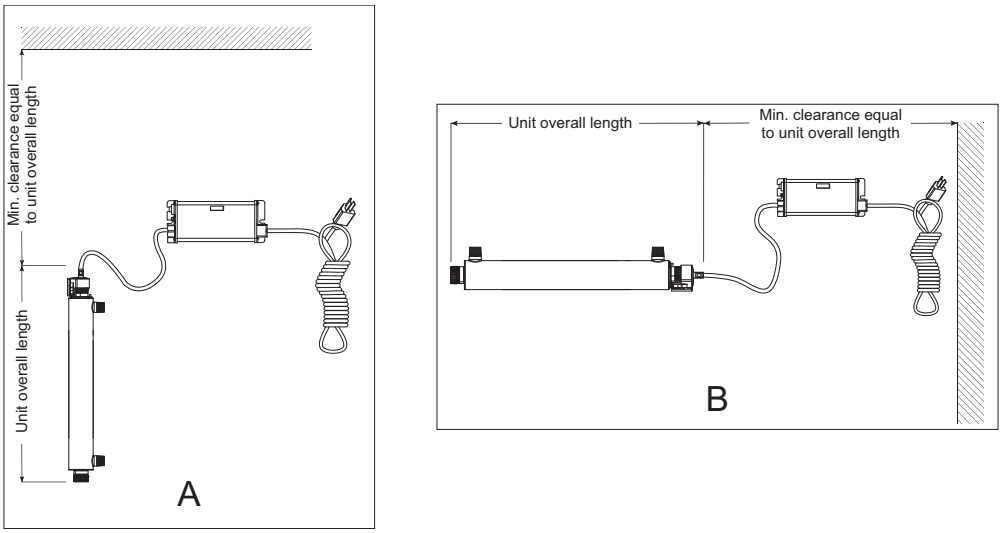


Figure 3 Disinfection Installation - Vertical and Horizontal

3. Mount the system to the wall using the supplied clamps. Various connection methods can be used to connect the water source to the system, however union type connectors are recommended. The use of a flow restrictor device will help to maintain the manufacturers rated flow. The flow restrictor should be installed on the outlet port and is designed to be installed in one direction only. Ensure that the flow of the water matches the flow direction as indicated on the flow restrictor. Refer to Figure 4.

   Note: *DO NOT solder connections while attached to the system as this could damage the O-ring seals.*

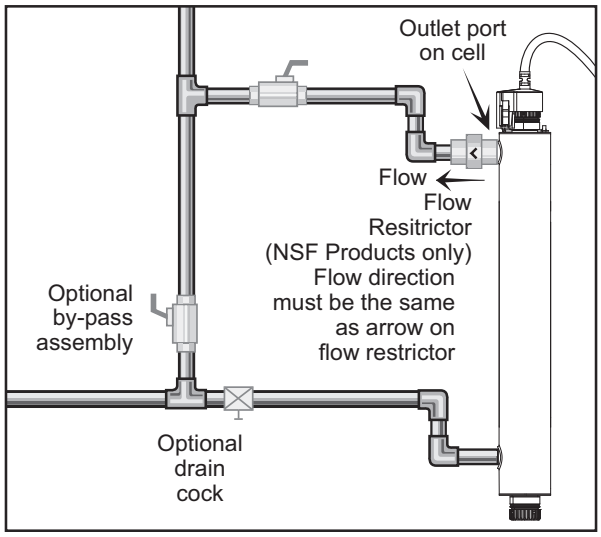


Figure 4 Flow Restrictor

4. Mount the VIQUA ICE controller horizontally to the wall, near the UV chamber. Ideally place the controller above the chamber and away from any water connection point, to prevent any water from potentially leaking onto the controller by means of a leak at a connection point or a “sweating” system. Make sure you allow for a “drip-loop” as shown in Figure 5 on the UV lamp, UV sensor, and power cord, again, to prevent any water from potentially entering the controller.

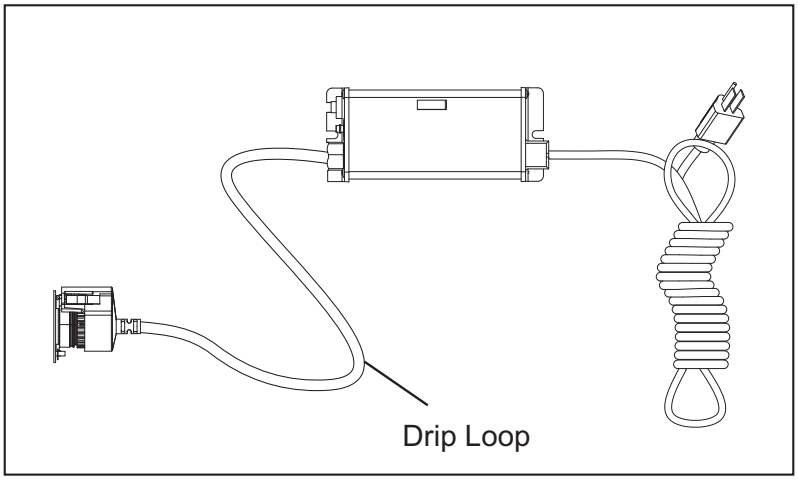


Figure 5 Drip Loop

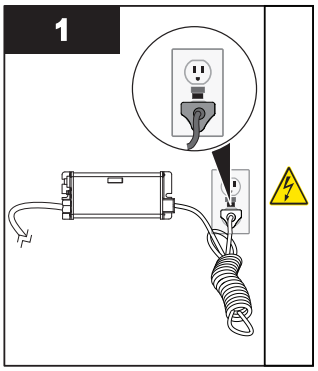
5. Install the UV lamp. Refer to Section 4.1.
6. When all plumbing connections are complete, slowly turn on the water supply and check for leaks. The most likely cause of leaks is from the O-ring seal. In case of a leak, shut water off, drain cell, remove the retaining nut, wipe the O-ring and threads. Clean and re-install.
7. Once it is determined that there are no leaks, plug the system into the ground fault interrupter and check controller to ensure the system is operating properly. The controller should illuminate without any alarms.

   Note: *DO NOT look directly at the glowing UV lamp.*
8. Allow the water to run for a few minutes to clear any air or dust that may be in the UV chamber.

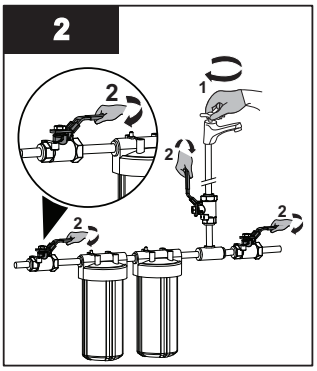
   Note: *When there is no flow, the water in the cell will become warm, as the UV lamp is always on. To remedy this, run a cold water tap anywhere in the house for a minute to flush out the warm water.*

3.2 Disinfection Procedure

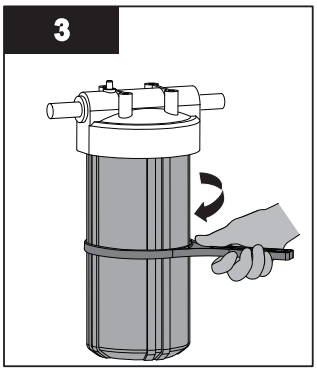
UV disinfection is a physical disinfection process and does not add any potentially harmful chemicals to the water. As UV does not provide a disinfection residual, it is imperative that the entire distribution system located after the UV be chemically disinfected to ensure that the plumbing system is free from any bacteriological contaminants. The disinfection process must be performed immediately after the UV unit is installed and repeated thereafter whenever the UV is shut down for service, without power, or inoperative for any reason. The procedure for sanitizing the plumbing system is readily accomplished as follows:



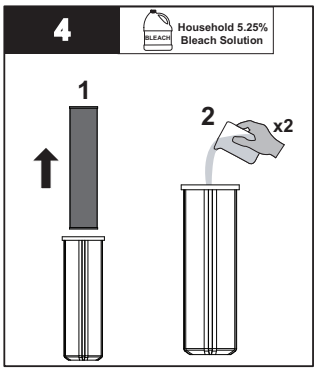
- Ensure the controller is plugged in for entire disinfection process.



- Shut off the water supply.
- Close each faucet.

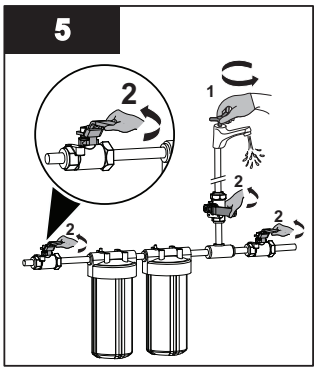


- Remove filter cartridge(s).

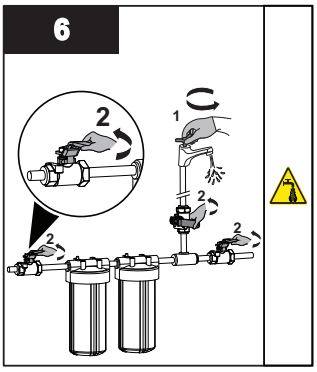


- Pour 2 cups of household bleach solution into the filter housing(s).

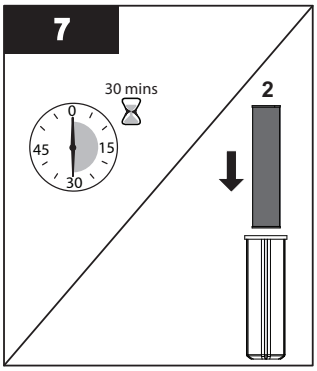
  Note: *DO NOT use Hydrogen Peroxide.*



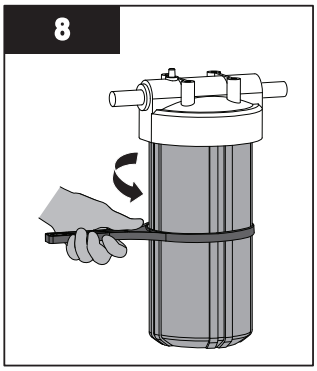
- Re-install the housings.
- Turn on the cold water supply.
- Open each faucet and all water openings until you smell the bleach and then close the faucets.



- Turn on the hot water supply.
- Open each faucet and all water openings until you smell the bleach and then close the faucets.



- DO NOT use water for 30 minutes.
- Flush the system until no chlorine smell is detectable and reinstall the filters.



- Reinstall filter housing(s).

Notes: *1) The addition of chlorine (bleach) to a hot water tank that has in the past been fed with untreated raw water with high levels of other contaminants (iron, manganese, hydrogen sulphide, organics, etc.) will result in oxidation of these contaminants and may require repeated flushing of the hot water tank. This contingency must be dealt with independently under the start-up procedure for any other conditioners that may form a part of the pre-treatment for the UV unit.*

2) The above disinfection procedure will result in a massive chlorine residual far in excess of the 0.5 to 1.0 mg/L typically present in municipally chlorinated water and of a magnitude consistent with the minimum 50 mg/L chlorine solution recommended for the disinfection of distribution systems known to be contaminated. DO NOT consume water until complete system has been flushed.

Section 4 Maintenance

⚠WARNING

- Always disconnect power before performing any work on the disinfection system.
- Always shut-off water flow and release water pressure before servicing.
- Regularly inspect your disinfection system to ensure that the power indicators are on and no alarms are present.
- Replace the UV lamp annually (or biennially if seasonal home use) to ensure maximum disinfection.
- Always drain the chamber when closing a seasonal home or leaving the unit in an area subject to freezing temperatures.

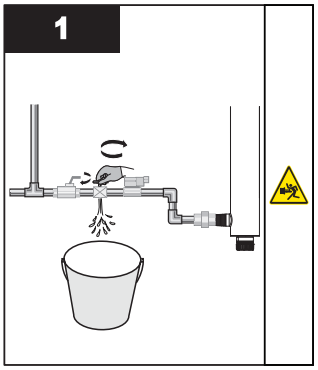
4.1 Replacing UV Lamp

NOTICE

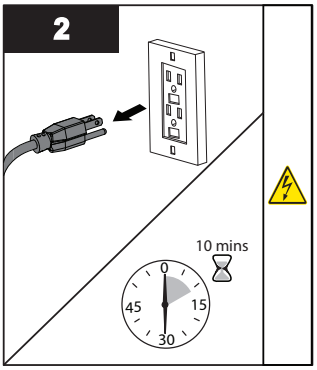
- Reset UV lamp life timer after UV lamp replacement. Refer to Section 5.1.3. Refer to www.lamprecycle.org for UV lamp disposal.
- DO NOT use water during replacement of UV lamp.

UV lamp replacement is a quick and simple procedure requiring no special tools. The UV lamp must be replaced after 9000 hours of continuous operation (approximately one year) in order to ensure adequate disinfection.

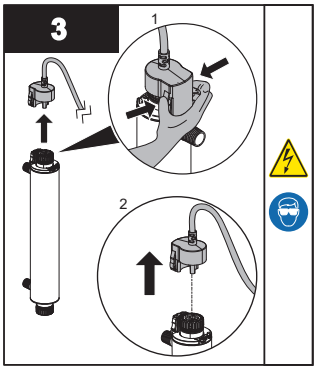
Procedure:



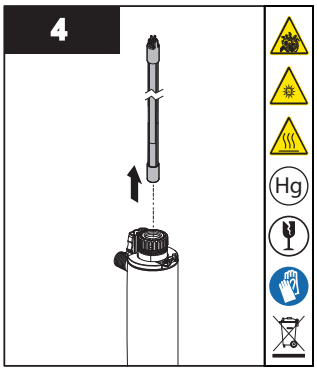
- Shut off the water line to chamber and release system pressure before servicing.



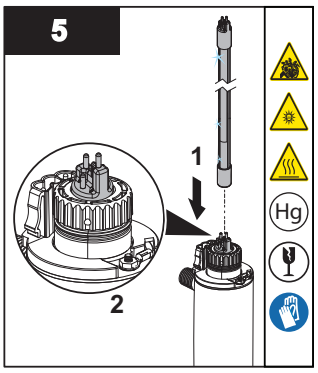
- Disconnect main power source and allow the unit to cool for 10 minutes.



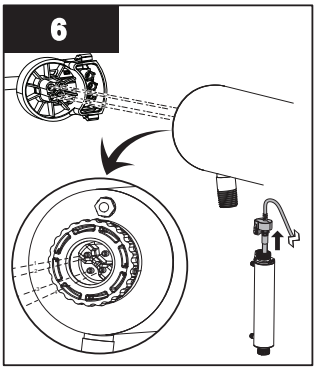
- Remove the lamp connector by squeezing the plastic locking tabs on the side of the connector.



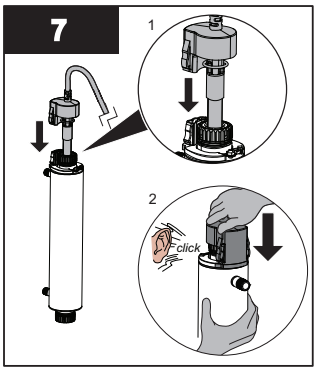
- Remove the lamp in upward direction from the chamber and lamp connector base.
- Always hold the lamp at the ceramic ends.



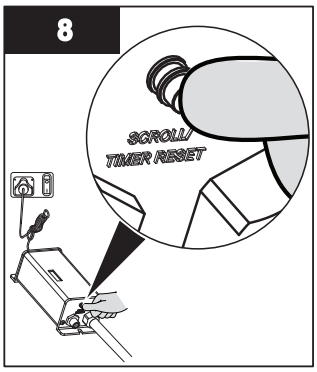
- Insert the new lamp fully into the chamber leaving about two inches of the lamp protruding from the chamber.



- Attach the connector to the lamp and note that the connector will only allow correct installation in one position.



- Push the lamp connector against lamp connector base together until an audible click is heard.
- Re-pressurize the system to check for leaks.



- Hold down the timer reset button and reapply power to the controller until you see rSEt, then release timer reset button.
- A 5 second delay will occur until you hear an audible tone and LED display will read once again 365.

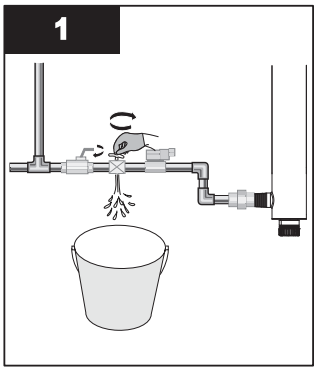
4.2 Cleaning and Replacing Quartz Sleeve

Note: *Minerals in the water slowly form a coating on the quartz sleeve. This coating must be removed because it reduces the amount of UV light reaching the water, thereby reducing disinfection performance. If the sleeve can not be cleaned, it must be replaced.*

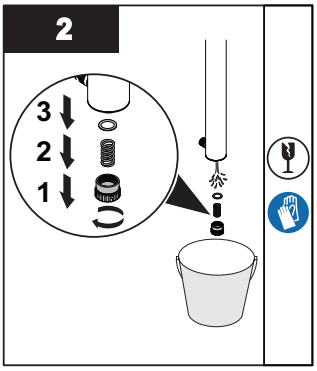
Prerequisites:

- Shut off water supply and drain all lines.
- Remove the UV lamp. Refer to Section 4.1.

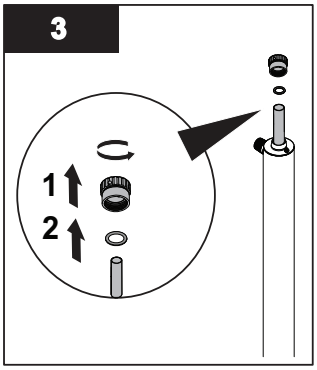
Procedure:



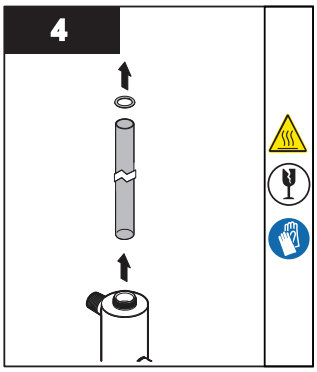
- Drain the chamber by using the drain port.



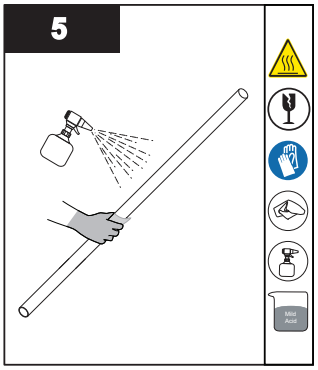
- Remove the bottom retaining nut, floating spring, and O-ring.



- Remove the top retaining nut and O-ring.

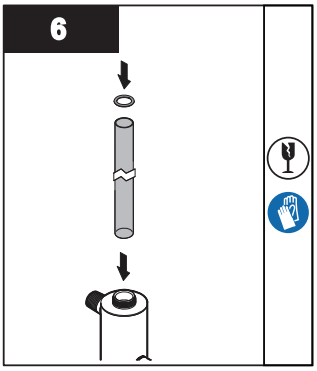


- Carefully, remove O-ring adhering to the quartz sleeve.
- Remove the quartz sleeve.

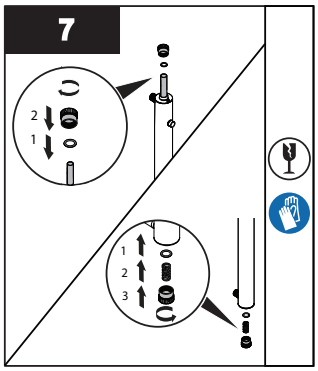


- Clean the quartz sleeve with a cloth soaked in CLR, vinegar or some other mild acid and then rinse with water.

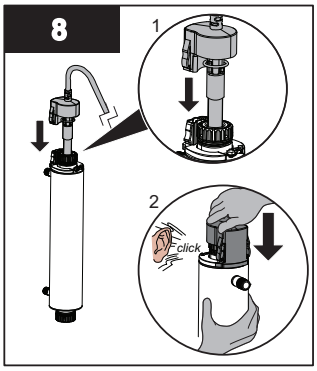
  Note: *If sleeve cannot be cleaned completely or it is scratched or cracked, then replace the sleeve.*



- Reinstall the quartz sleeve in the chamber allowing the sleeve to protrude an equal distance at both ends of the chamber.
- Slide supplied O-rings onto each end of the quartz sleeve.



- Reinstall the top and bottom retaining nuts, floating spring, and O-rings respectively.
- When service is complete, assemble the prerequisites in the reverse order of disassembly.



- Push the lamp connector against lamp connector base together until an audible click is heard.
- Plug in controller and verify the POWER-ON LED display.
- Re-pressurize the system to check for leaks.

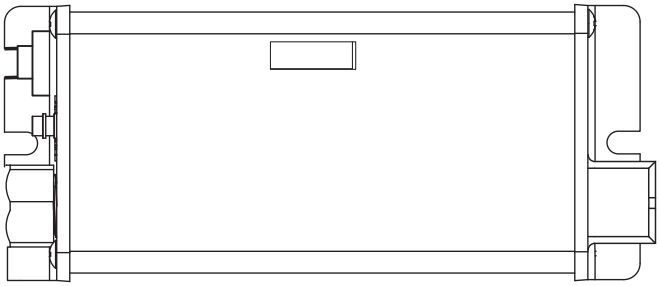
Note: *After replacing the UV lamp or quartz sleeve perform the disinfection procedure, refer to Section 3.2.*

Section 5 Operation

⚠ WARNING

The advanced warning system has been installed to provide the optimum protection against microbiological contamination in water. DO NOT disregard the warning signals. The best way to ensure optimum UV performance is to have the water microbiologically tested by a recognized testing agency on a regular basis.

5.1 Basic Systems Incorporating BA-ICE-S Controller



5.1.1 UV lamp Life Remaining (days)

365 The controller tracks the number of days of operation of the UV lamp and the controller. The default screen will display the total UV lamp life remaining (in days). The controller will count down the number of days remaining until the UV lamp requires changing (365 days to 1 day). At “0” days, the controller will display A3 and sound an intermittent audible chirp (1 second on, 5 seconds off), indicating the need to change the UV lamp.

5.1.2 Understanding your “A3” Code

A3 ***DEFERRAL*** - Once the “A3” or end of UV lamp life message is shown on the LED display, the audible alarm can be deferred up to 4 separate times. The delay is designed to allow you time to address the alarm while you obtain a new UV lamp. This can be done by simply depressing the timer reset button for 5 seconds, which is located on the left side of the controller. Each time the timer reset button is pressed the controller alarm is deferred seven days. Once the final 7 day deferral has been reached the alarm can only be silenced by changing the UV lamp and manually resetting the controller timer, refer to Section 4.1.

5.1.3 Resetting UV lamp Life

Refer to Section 4.1.

Note: *Even though the alarm on the system can be deferred for a period of time, it is important to address each and every alarm condition as they are indicating that there is a potential problem with the system and should be remedied.*

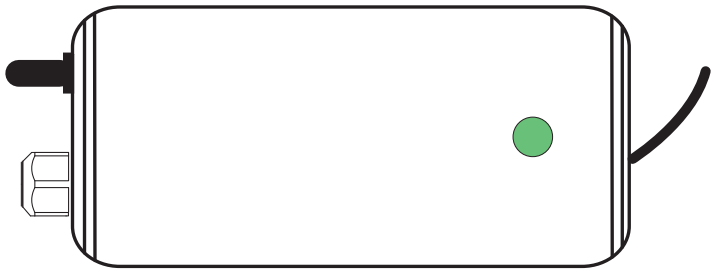
5.1.4 Total Days of Operation

1680 The controller also displays the total running time of the controller. To obtain this reading, press the push-button once. The total running time of the controller will be numerically displayed in days. This information will remain displayed for ten seconds and will then revert back to the UV lamp life remaining default screen. It should be noted that this value cannot be reset.

5.1.5 UV lamp Failure (Blank Screen)

When the system recognizes UV LAMP FAILURE (no current running through the UV lamp), the display will be blank (no default UV LAMP LIFE REMAINING screen) and the system will sound an intermittent audible tones (1 second on,1 second off). The system will remain in this state, until this condition is remedied.

5.2 12VDC Systems Incorporating BA-RO/P/12 Controller



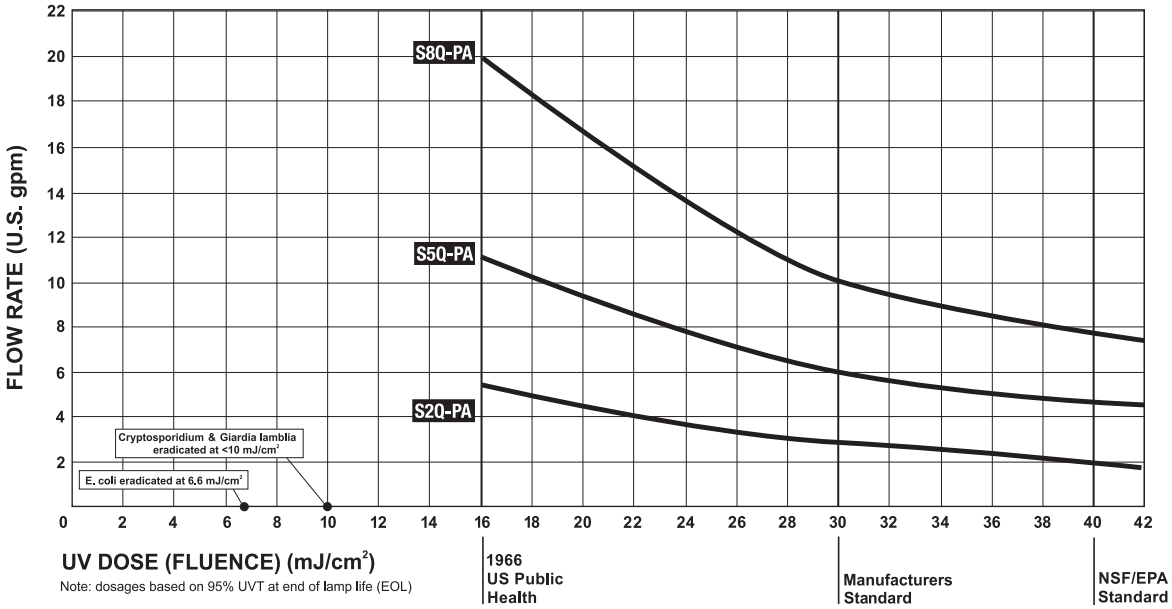
Green LED indicates UV lamp “ON”.

Section 6 Troubleshooting

Symptom	Possible Causes	Solutions
Pressure Drop	Sediment pre-filter clogged	Replace filter cartridge with appropriate 5 micron cartridge. ***Note:*** *Check source water supply as fluctuations may occur in source pressure.*
	Flow regulator	Flow regulator will result in pressure drop when approaching full flow.
High Bacteria Counts	Quartz sleeve is stained or dirty	Clean sleeve with scale cleaner and eliminate source of staining problem (ie. soften hard water, refer to Section 4.2.
	Change in feed water quality	Have source water tested to ensure that water quality is still within allowable limits for this system.
	Contamination in water lines after UV system (eg. power failures, plumbing	Disinfection system must have a bacterial free distribution system to work effectively. Refer to Section 3.2
	Possible break-through of sediment through pre-filter	Have source water tested for turbidity - may need stepped filtration in order to catch all sediment entering water system (20 micron filter followed by a 5 micron filter followed by UV
Heated Product Water	Common problem caused by infrequent use of water	Run water until it returns to ambient temperature.
Water Appears Milky	Caused by air in the water lines	Run water until air is purged.
Unit Leaking Water	Problem with O-ring seal (on retaining nut and/or UV sensor)	Ensure O-ring is in place, check for cuts or abrasions, clean O-ring, moisten with water/ lubricant and re-install, replace if necessary (410867).
	Condensation on UV chamber caused by excessive humidity & cold water	Check location of disinfection system and control humidity.
	Inadequate inlet/outlet port connections	Check thread connections, reseal with Teflon® tape and re-tighten.
System Shutting Down Intermittently	Interrupted controller	• Ensure system has been installed on its own circuit, as other equipment may be drawing power away from UV (ie. pump or fridge). • UV system should not be installed on a circuit which is incorporated into a light switch.
UV lamp Failure Alarm on - New lamp	Loose connection between UV lamp and connector	Disconnect UV lamp from connector and reconnect, ensuring that a tight fit is accomplished
	Moisture build up in connector may keep UV lamp and connector from making a solid connection	Eliminate chance of any moisture getting to the connector and/or lamp pins

DISPLAY FAULT MODES	
LED display reads “A3”	• UV lamp life expired - countdown is at “0” days. Refer to Section 5.1.2, Understanding your A3 Code. • Press reset button for a deferred alarm, replace UV lamp
LED display is blank	• Controller is in UV lamp failure mode. Refer to Section 5.1.5, UV Lamp Failure. Replace UV Lamp, refer to Section 4.1. • Power system down, allowing it to reset itself; apply power in order to confirm that the controller is able to power UV lamp • Check to see if there is sufficient power to the UV system
Green LED off (12 VDC only)	• UV lamp failure. Replace UV Lamp, refer to Section 4.1. • No input voltage to controller

Section 7 Manufacturer's Dose Flow Chart



Section 8 Specifications: Standard and Validated

Model		S2Q-P/12VDC/ S2Q-PA		S5Q-P/12VDC/ S5Q-PA/SV5Q-PA*		S8Q-PA/ SV8Q-PA*
Flow Rate	*NSF Class B Certified 16mJ/cm^2 @ 70% UVT	-		3.6 gpm (13.6 lpm) (0.8 m^3/hr)		7 gpm (26.5 lpm) (1.6 m^3/hr)
	US Public Health 16mJ/cm^2 @ 95% UVT	5 gpm (19 lpm) (1.1 m^3/hr)		11 gpm (42 lpm) (2.5 m^3/hr)		20 gpm (75 lpm) (4.5 m^3/hr)
	VIQUA Standard 30 mJ/cm^2 @ 95% UVT	3 gpm (11 lpm) (0.7 m^3/hr)		6 gpm (23 lpm) (1.4 m^3/hr)		10 gpm (38 lpm) (2.3 m^3/hr)
	NSF/EPA 40mJ/cm^2 @ 95% UVT	2 gpm (7 lpm) (0.4 m^3/hr)		4.5 gpm (17 lpm) (1.0 m^3/hr)		8 gpm (29 lpm) (1.8 m^3/hr)
Dimensions	Chamber	43.2 cm x 6.4 cm (17" x 2.5")		56 cm x 6.4 cm (22" x 2.5")		90 cm x 6.4 cm (35" x 2.5")
	Controller 100-250 VAC	18.6 cm x 8.1 cm x 6.4 cm (7.3" x 3.2" x 2.5")		18.6 cm x 8.1 cm x 6.4 cm (7.3" x 3.2" x 2.5")		18.6 cm x 8.1 cm x 6.4 cm (7.3" x 3.2" x 2.5")
	Controller 12 VDC	13.5 cm x 4.3 cm x 5.8 cm (5.3" x 1.7" x 2.3")		13.5 cm x 4.3 cm x 5.8 cm (5.3" x 1.7" x 2.3")		-
Inlet/Outlet Port Size[1]		1/2" MNPT		3/4" MNPT"		3/4" MNPT
Shipping Weight		2.7 kg (6 lbs)		2.7 kg (6 lbs)		4.5 kg (10 lbs)
Electrical	Voltage[2]	100-240 V / 50/60 Hz	12 VDC	100-240 V / 50/60 Hz	12 VDC	100-240 V / 50/60 Hz
	Max. Current	0.6 Amp	1.8 Amp	0.6 Amp	1.8 Amp	0.6 Amp
	Power Consumption	22 W	20 W	30 W	27 W	46 W
	UV lamp Watts	17 W	15 W	25 W	20 W	37 W
Maximum Operating Pressure		125 psi (861 kPa)		125psi (861 kPa)		125 psi (861 kPa)
Minimum Operating Pressure		15 psi (103 kPa)		15psi (103 kPa)		15 psi (103 kPa)
Ambient Water Temperature		2-40 ºC (36-104 ºF)		2-40 ºC (36-104 ºF)		2-40 ºC (36-104 ºF)
UV Lamp Type		Sterilume™-EX (standard-output)		Sterilume™-EX (standard-output)		Sterilume™-EX (standard-output)
UV Chamber Material		304 SS		304 SS		304 SS

[1] Units ending in "/2B" have BSPT connections.

[2] Units ending in "/2" are for 230V applications.

Section 9 Manufacturer’s Warranty

Our Commitment

VIQUA is committed to ensuring your experience with our products and organization exceeds your expectations. We have manufactured your UV disinfection system to the highest quality standards and value you as our customer. Should you need any support, or have questions about your system, please contact our Technical Support team at 1.800.265.7246 or technicalsupport@viqua.com and we will be happy to assist you. We sincerely hope you enjoy the benefits of clean, safe drinking water after the installation of your VIQUA disinfection system.

How to Make a Warranty Claim

Note: *To maximise the disinfection performance and reliability of your VIQUA product, the system must be properly sized, installed and maintained. Guidance on the necessary water quality parameters and maintenance requirements can be found in your Owner’s Manual.*

In the event that repair or replacement of parts covered by this warranty are required, the process will be handled by your dealer. If you are unsure whether an equipment problem or failure is covered by warranty, contact our Technical Support team at 1.800.265.7246 or e-mail technicalsupport@viqua.com. Our fully trained technicians will help you troubleshoot the problem and identify a solution. Please have available the model number (system type), the date of purchase, the name of the dealer from whom you purchased your VIQUA product (“the source dealer”), as well as a description of the problem you are experiencing. To establish proof of purchase when making a warranty claim, you will either need your original invoice, or have previously completed and returned your product registration card via mail or online.

Specific Warranty Coverage

Warranty coverage is specific to the VIQUA range of products. Warranty coverage is subject to the conditions and limitations outlined under “General Conditions and Limitations”.

Ten-Year Limited Warranty for VIQUA UV Chamber

VIQUA warrants the UV chamber on the VIQUA product to be free from defects in material and workmanship for a period of ten (10) years from the date of purchase. During this time, VIQUA will repair or replace, at its option, any defective VIQUA UV chamber. Please return the defective part to your dealer who will process your claim.

Three-Year Limited Warranty for Electrical and Hardware Components

VIQUA warrants the electrical (controller) and hardware components to be free from defects in material and workmanship for a period of three (3) years from the date of purchase. During this time, VIQUA will repair or replace, at its option, any defective parts covered by the warranty. Please return the defective part to your dealer who will process your claim.

One-Year Limited Warranty for UV lamps, Sleeves, and UV Sensors

VIQUA warrants UV lamps, sleeves, and UV sensors to be free from defects in material and workmanship for a period of one (1) year from the date of purchase. During this time, VIQUA will repair or replace, at its option, any defective parts covered by the warranty.Your dealer will process your claim and advise whether the defective item needs to be returned for failure analysis.

Note: *Use only genuine VIQUA replacement lamps and sleeves in your system. Failure to do so may seriously compromise disinfection performance and affect warranty coverage.*

General Conditions and Limitations

None of the above warranties cover damage caused by improper use or maintenance, accidents, acts of God or minor scratches or imperfections that do not materially impair the operation of the product. The warranties also do not cover products that are not installed as outlined in the applicable Owner’s Manual.

Parts repaired or replaced under these warranties will be covered under warranty up to the end of the warranty period applicable to the original part.

The above warranties do not include the cost of shipping and handling of returned items.The limited warranties described above are the only warranties applicable to the VIQUA range of products. These limited warranties outline the exclusive remedy for all claims based on a failure of or defect in any of these products, whether the claim is based on contract, tort (including negligence), strict liability or otherwise. These warranties are in lieu of all other warranties whether written, oral, implied or statutory. Without limitation, no warranty of merchantability or of fitness for a particular purpose shall apply to any of these products.

VIQUA does not assume any liability for personal injury or property damage caused by the use or misuse of any of the above products. VIQUA shall not in any event be liable for special, incidental, indirect or consequential damages. VIQUA’s liability shall, in all instances, be limited to repair or replacement of the defective product or part and this liability will terminate upon expiration of the applicable warranty period.

Attachment D2

Operation, Monitoring & Maintenance Manual, Point of Use (POU) Treatment Systems, Private Water Supply Systems, Bennington, Vermont

January 17, 2020

Operation, Maintenance & Monitoring Manual (Revision 1) Point of Use (POU) Treatment Systems Private Water Supply Systems Bennington, Vermont

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C.T. Male Associates Project No: 16.6131

POU OM&M Manual
Bennington, Vermont

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 POU Intent & Objective

This Point of Use (POU) Operation, Monitoring and Maintenance (OM&M) Manual has been revised to comply with the Consent Order and Final Judgment, effective dated May 28, 2019 (Consent Order) which supersedes the Consent Order and Final Judgement dated October 2, 2017.

The Consent Order defines two corrective action areas: Corrective Action Area I (CAAI) and Corrective Action Area II (CAAII) and, for the purpose of this plan, are collectively referred to as Corrective Action Areas (CAAs). CAAI generally consists of a bounded area west of Route 7 and CAAII generally consists of a bounded area east of Route 7. CAAI is divided into two operable units and CAAII is divided into three operable units. Operable Unit A (OUA) in CAAI and CAAII and Operable Unit C (OUC) in CAAII are the subject of separate corrective action plans prepared by the Vermont Agency of Natural Resources (ANR). Operable Unit B (OUB) in CAAI and CAAII are the subject of this corrective action plan.

This manual provides the requirements for the installation, operation, monitoring and maintenance of Point of Use (POU) water treatment systems installed at residential locations within the Village of North Bennington (Village) and Town of Bennington (Town), Vermont.

A POU is installed to treat water at a main point of use within a residence, typically the kitchen sink. In this manner, the POU provides treated water for per- and polyfluoroalkyl substances (PFAS) at the main point of use and consumption within the residence. The point-of-use water treatment system will allow residents to utilize treated water from a single point in their home. This manual does not pertain to Public Water Systems or Non-Transient Water Systems.

On June 22, 2016 Vermont Health Department promulgated a drinking water health advisory of 20 parts per trillion (ppt) applicable to the sum of perfluorooctanesulfonic acid (PFOS) and PFOA. An emergency rule adopted on July 11, 2018 for the Vermont

Groundwater Protection Rule & Strategy (Chapter 12 of Environmental Protection Rules) updated the PFAS-specific Vermont Groundwater Enforcement Standard to a concentration of 20 ppt for any combination of perfluorohexanesulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), perfluorononanoic acid (PFNA), PFOA, and PFOS (Regulatory Standard).

2.0 PURPOSE & ORGANIZATION OF WORK PLAN

2.1 Organizational Structure

The Vermont Department of Environmental Conservation (VTDEC) will provide overall project oversight during the project. C.T. Male Associates Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C. (C.T. Male) will be responsible for overall management of the POU installation, operation and monitoring aspects of the project. Culligan will be responsible for scheduling the installation of each POU, scheduled and non-scheduled maintenance of the POUs, and removal of the POUs.

2.2 Installation and Maintenance Contractor

The installation and maintenance of the POUs will be completed by Culligan.

2.3 Standard Treatment System Design

The standard POU treatment system includes the following components:

- 5 Micron Sediment Cartridge Filters
- Carbon Block Pre-filter Cartridge
- Total Defense Cartridge Filters

The function of the 5 micron sediment cartridge filter in each of the above systems is to filter out suspended solids 5 microns in size or greater. The main objective of this filter is to catch particulate matter prior to the granular activated carbon (GAC) filters so that the life of the GAC cartridge is not reduced by this matter. The Carbon Block pre-filter is the initial GAC filter cartridge in each system. They are designed to reduce pre and poly-fluorinated substances (PFAS) present in the drinking water to levels below applicable standards. The Total Defense Cartridge Filers are GAC cartridge filters designed to capture PFAS breakthrough from the Carbon Block pre-filters. A schematic of a typical POU system installation is presented in Appendix B. The manufacturer's information, installation, and operation manuals for each system component are presented in Appendix C. The plumbing piping and fittings used are composed of

RO/DI tubing, one quarter inch and three eighths inch in diameter. All plumbing fittings are NSF approved.

2.4 Operational Overview

Culligan will install the Aqua-Cleer faucet system which is a separate faucet installed at the sink (typically the kitchen sink).

Aqua-Cleer Faucet System:

In this system set-up, a separate faucet is installed at each POU. The user will operate the new Aqua-Cleer Faucet for filtered water. To use untreated water, the user will operate the existing faucet.

This POU system operates through pressurized flow from the water supply well pump and pressure system. The filter system is connected to the existing cold water supply underneath the sink. Water is conveyed through the filter system to the Aqua-Cleer Faucet. The Aqua-Cleer Faucet will require an additional hole to be drilled through the sink top or countertop for installation. Glasses for drinking or pots for cooking can be filled from the Aqua-Cleer Faucet. The user will notice a reduction in flow and pressure when water is being delivered from the Aqua-Cleer Faucet as opposed to the normal sink faucet.

2.5 POU System Startup

Prior to installing a POU, Culligan will complete a site visit to review the existing water system and area required for the equipment installation. In most instances the POU is installed beneath the counter of the water fixture to be connected with the POU, but this may not always be possible depending on existing conditions. During the pre-installation site visit, an un-treated water sample from the source is collected and analyzed by Culligan for Hardness, Iron, Manganese, Hydrogen Sulfide, Alkalinity, Total Dissolved Solids and pH. This data is retained by Culligan for future review and evaluation.

2.6 Laboratory Analyses of POU Treated Water

Following the installation of the POUs, each will be sampled. A sample of the treated water will be collected for PFAS analysis by EPA Method 537.1 to document it is being adequately removed to concentrations below the Regulatory Standards. The samples will be sent to the laboratory of record for analysis. If the results for these samples indicate adequate removal, further sampling and testing of the treated water will not be performed.

Although the presence of naturally occurring arsenic in GAC media is periodically detected at concentrations greater than the current regulatory value of 10 parts per billion for drinking water, the Culligan POU GAC cartridges have been independently certified by the NSF to be arsenic free. As a result, arsenic sampling and analysis of the POU is not necessary.

2.7 Termination of POU Use

In the event a location that has received a POU is connected to municipal water or an alternative approved source of water not containing PFAS above Regulatory Standards, the POU system will be disconnected and removed from the premises.

The property owner will be given the opportunity to keep the system components after they have been permanently disconnected. If the property owner would like to again use the system, it will be the owner's responsibility to have a licensed water treatment specialist complete the installation as well as be responsible for the POU system operation and maintenance.

3.0 POU INSTALLATION RECIPIENTS

3.1 Property Owner Agreements

Prior to the installation of a POU, each property owner will be required to review and sign an agreement indicating their intent to either keep the POU after they have been connected to an alternate water source, or to have it removed. Those property owners who choose to keep the POU will be responsible for the future operation and maintenance.

4.0 INSPECTION AND MAINTENANCE REQUIREMENTS

4.1 Scheduled Inspection and Maintenance

Following the installation of each POU system, a quality control inspection of the system is completed by Culligan management to ensure all system components have been installed and are properly functioning.

4.2 Canister Change Out

The GAC Carbon Block canister is proposed to be changed every four months while the POU system is in place treating water containing PFAS above the Regulatory Standard.

4.3 Filter Change Out

The polypropylene sediment cartridge filter and Total Defense Cartridge filter will be replaced by Culligan every 4 months. The frequency of filter changes may be modified over time as location specific data is developed for each POU system.

5.0 REPORTING

5.1 Sample Results

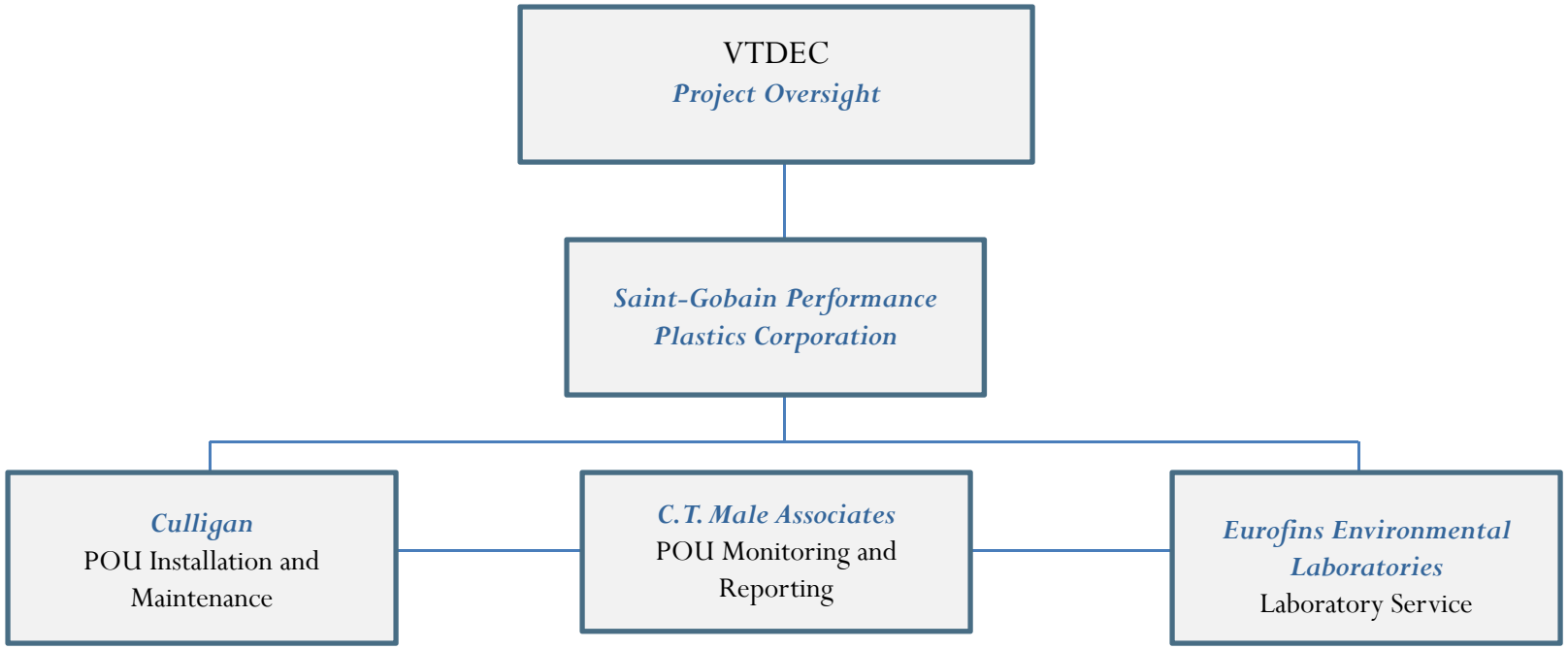
The results of each monitoring event for each POU system will be provided to VTDEC in accordance with the Consent Order sample reporting requirements. The results for all POU system sampling events, dating back to the initial set of VTDEC results from the water supply wells, will be provided in a master Excel spreadsheet to VTDEC on an annual basis.

5.2 System Data Records

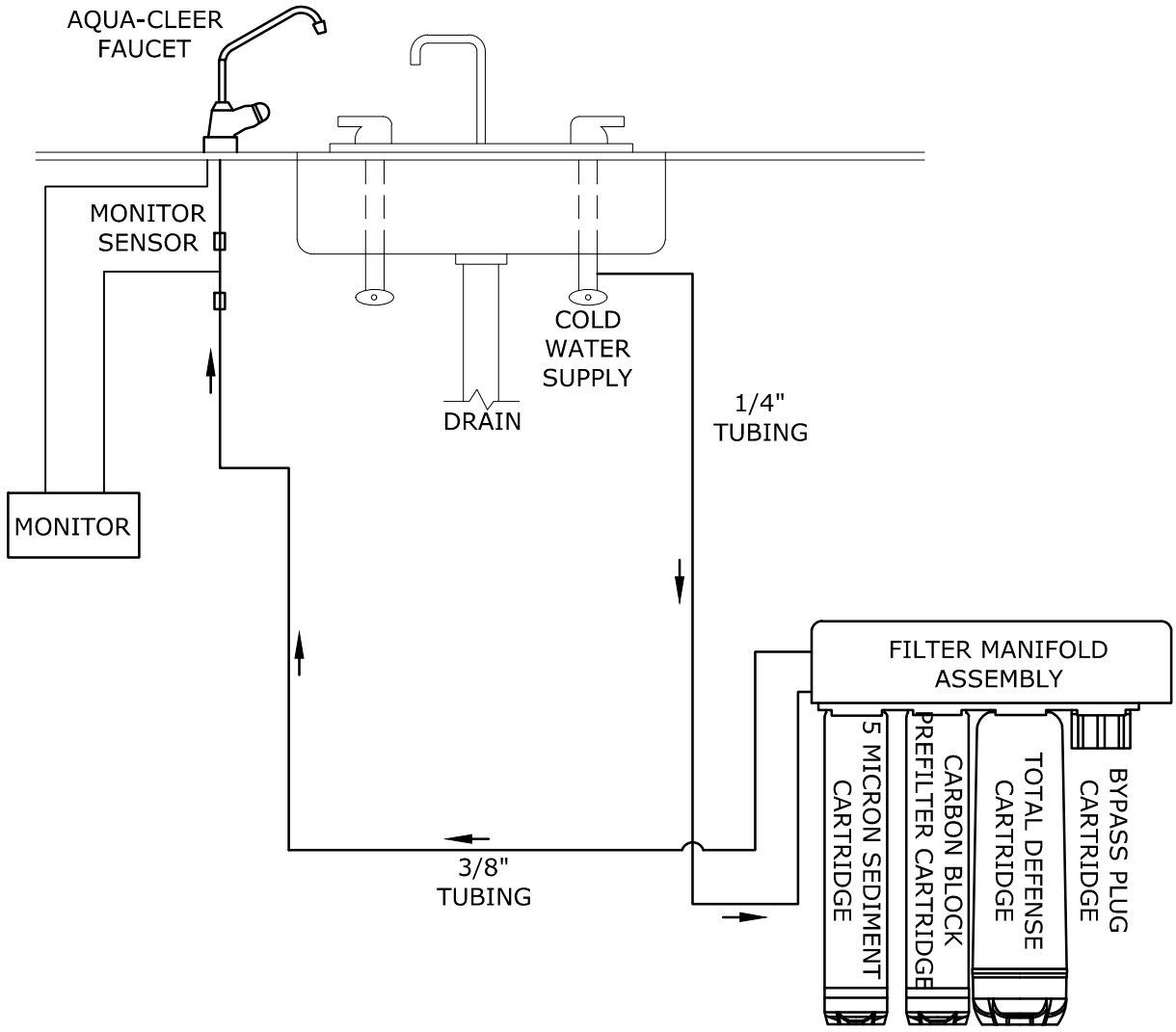
C.T. Male/Culligan will retain system data and maintenance records in electronic format for each POU installation. This will include all of the data and information specified herein. The system data records will also be provided to VTDEC upon request.

APPENDIX A
PROJECT ORGANIZATION

TABLE 1 – PROJECT ORGANIZATION



APPENDIX B
POU SYSTEM INSTALLATION SCHEMATICS



Date	RECORD OF WORK	Appr.

Drafter: SMW	Checker: CRK
Appr. by: CRK	Proj. No. 16.6131

SCHEMATIC
TYPICAL SMALL GAC POU SYSTEM
RESIDENTIAL APPLICATIONS

TOWN OF BENNINGTON	BENNINGTON COUNTY, VERMONT

C.T. MALE ASSOCIATES
Engineering, Surveying, Architecture & Landscape Architecture, D.P.C.
50 CENTURY HILL DRIVE, LATHAM, NY 12110
518.786.7400 * FAX 518.786.7299

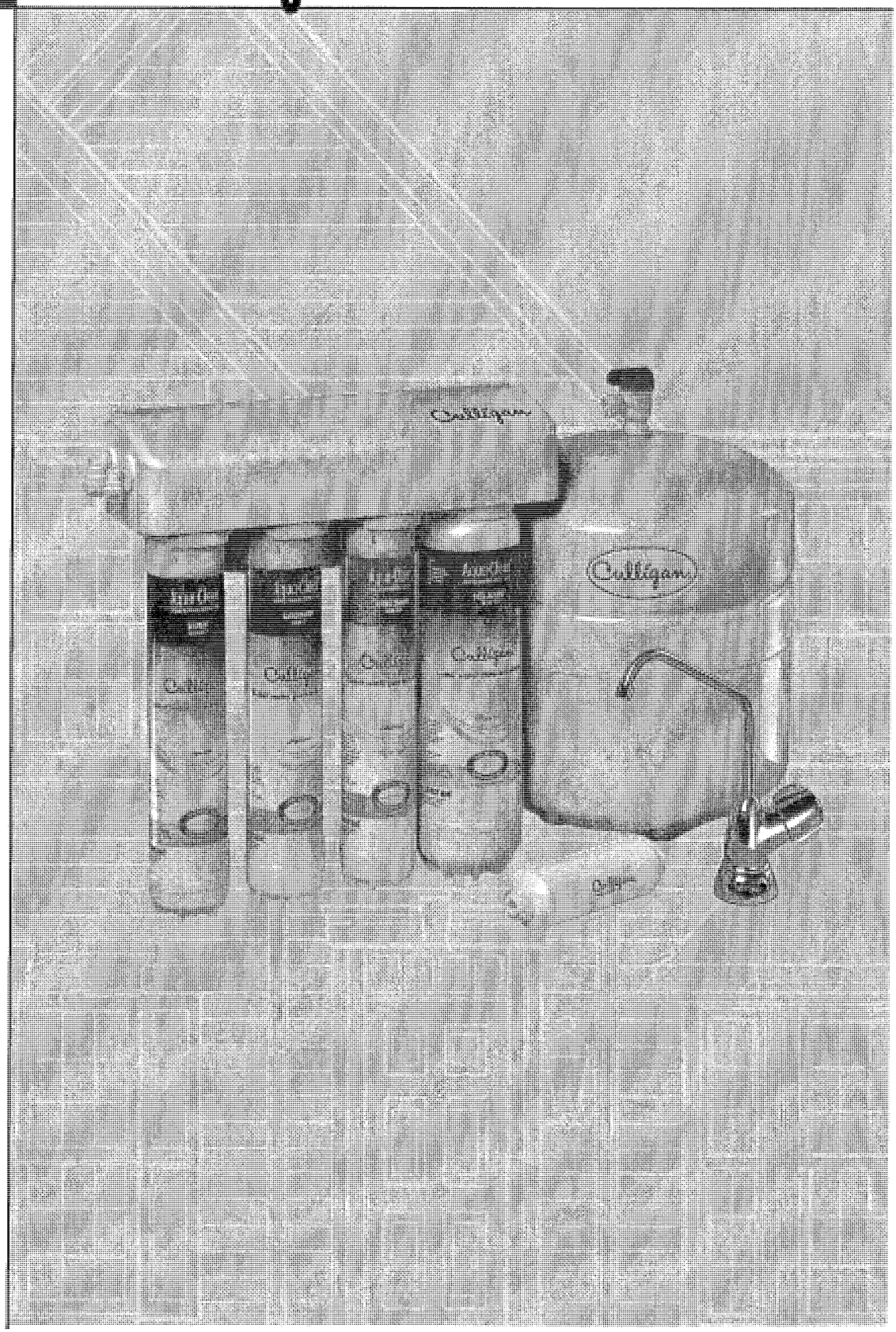
SCALE: NONE	DATE: JANUARY 2, 2019

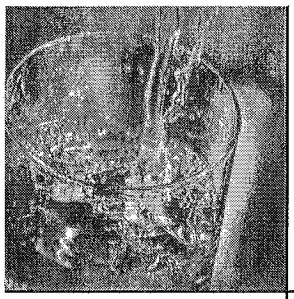
CAD DWG. FILE NAME: K:\Projects\166131\Civil\Drawings-Maps\POU schematic - FAUCET.dwg
NONE :XREFS

APPENDIX C
POU INSTALLATION AND OPERATIONS MANUAL (CULLIGAN)

Culligan®

Culligan® Aqua-Cleer® Advanced Drinking Water Systems Owners Guide





THANK YOU

AND WELCOME TO YOUR NEW WORLD OF BETTER LIVING WITH CULLIGAN WATER.

Notice: Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. Systems certified for cyst reduction may be used on disinfected water that may contain filterable cysts.

For installations in Massachusetts: Massachusetts Plumbing Code 248 CMR shall be adhered to. Consult your licensed plumber for installation of this system. The use of saddle valves is not permitted in Massachusetts.

Check with your public works department for applicable local plumbing and sanitation codes. Follow your local codes if they differ from the standards used in this manual.

Operational, maintenance and replacement requirements are essential for this product to perform properly. Talk to you Culligan dealer about a service and maintenance program to ensure your filters are replaced in a timely manner and annual water tests are also recommended (especially on well water) to ensure the system is functioning properly.

Culligan International Company
9399 West Higgins Road
Rosemont, Il. 60018
1-800-Culligan
www.culligan.com

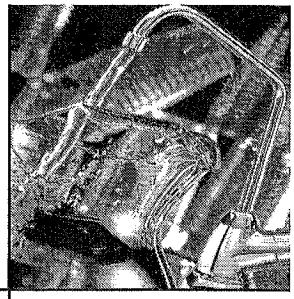


Table of Contents

About Your System

Thank you for choosing a Culligan Aqua-Cleer advanced drinking water system. Your new system is designed to bring you years of deliciously crystal-clear Culligan water. The best part is it comes right from the tap. No more lugging around bottles or waiting for pitchers to slowly fill up. With your continuous supply of great tasting water, not only can you get your 8 glasses a day but you can easily use it for cooking, coffee, juice, baby formula, ice cubes, anything you use water with.

The important thing to remember is to change out your filters on a regular basis. The quality of your water is only as good as the quality of your filters. Each filter is designed to last for 1,000 gallons (roughly 12 months). Membranes will last longer if used with pre-filtration. A flow monitor is available with your system to let you know when you have consumed 1,000 gallons of water through your system. If you did not purchase one with your system, you may consider asking your Culligan man about having one installed. Faucets with reminder lights are also available.

System Specifications:

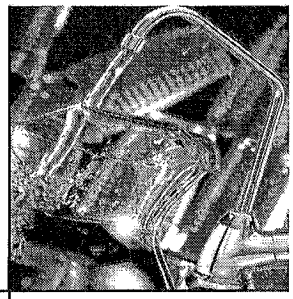
Dimensions	Filter Assembly Standard Storage Tank Medium Storage Tank Large Storage Tank	13.8" wide x 4.2" deep x 15.5" high 9" diameter x 14" high 11" diameter x 14" high 15.5: diameter x 24" high
Storage Tank Capacity	Standard Medium Large	2 gallons 3 gallons 9 gallons
Reverse Osmosis Efficiency Rating	Standard Medium Large	16.86% 16.86% 16.86%
Reverse Osmosis Recovery Rating	Standard Medium Large	33.49% 33.49% 33.49%

Filtration Options:

Sequence of Filtration	Type of Filtration	Specification
Pre-Filtration	Sediment	1 2 3
	Carbon	Block Granulated Active Carbon Granulated Active Carbon - Large
Membrane	Reverse Osmosis	30 gpd 50 gpd*
	Nano Filtration†	30 gpd

* Cartridges not for sale in California.

† Cartridges not for sale in California or Iowa.



Sequence of Filtration	Type of Filtration	Specification
Advanced Filtration	Total Defense	Speciality Carbon Block
	Arsenic	Specialty Media [1]
	Perchlorate*	Specialty Media [1]
Post-Filtration	Carbon	Granulated Activated Carbon Block

* Cartridges not for sale in California

[1] Specialty media cartridges must be installed after the RO membrane and system must have a Performance Indicator Device (PID) installed to track gallon usage.

Purpose of each level of filtration:

Pre-Filtration:

Pre-filtration for this system is used to reducing large contaminants from the water before they reach either the reverse osmosis or nano filtration membrane. The use of pre-filtration cartridges helps extent the membrane's life. There are two types of pre-filtration available with this system: sediment filtration and carbon filtration.

Sediment Filtration: Sediment is defined as sand, dirt, silt, fine sand and or coarse sand that can be found in many water supplies.

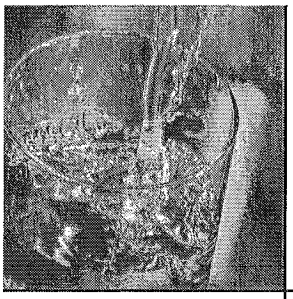
Carbon Filtration: Carbon is used to reduce chlorine taste and odor. Most people often describe this taste as being slightly chemical or they equate their drinking water to that of the local pool. Municipalities use chlorine to disinfect the water on the way to your home. This is a necessary step to delivering safe water to your home but depending on the level of chlorine by the time it reaches your home the taste of your water may be unpalatable.

Membrane Technologies:

The Aqua-Cleer system can utilize two different membrane technologies; reverse osmosis and nano filtration. Each one of these technologies use a tightly woven membrane that acts as a barrier to contaminants. Water is pushed up against this membrane at pressure. Depending on the weave of the membrane only a certain percentage of contaminants can pass through. Reverse Osmosis can reduce up to 99% of contaminants. The reason you may choose nano filtration versus reverse osmosis is often a question of taste. Some of the things that give water its taste are minerals such as calcium and magnesium. A nano filtration membrane will leave more of those minerals in the water.

Advanced Filtration:

The advanced filtration cartridges are specifically designed to reduce contaminants that reverse osmosis membranes are not efficient in removing.



About Your System (con't)

Total Defense:

The Total Defense cartridge should be added to your system to deal with lead, mercury, aesthetic chloramines, aesthetic chlorine taste and odor, cysts, Volatile Organic Compounds (VOC) and MTBE.

- Chloramines have a stronger taste and are more difficult to remove than chlorine.
- Mercury is a toxin that can cause kidney damage.
- Lead is a toxin that can cause kidney problems or high blood pressure in adults and developmental problems in children.
- Cysts are a common cause of health issues. They can be found in some municipal water sources but more often found in wells under the influence of surface water.
- VOC is a name given to a wide range of organic contaminants, some are known to be carcinogenic.
- MTBE was used in gasoline to reduce emissions and is considered harmful.

Perchlorate*:

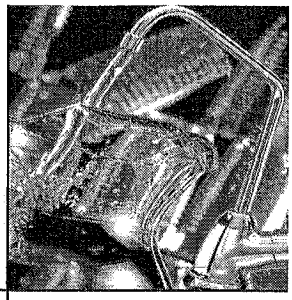
Perchlorate is a by-product of munitions manufacturing (common in solid rocket fuel, road flares, etc) that can be found in some water sources.

Arsenic:

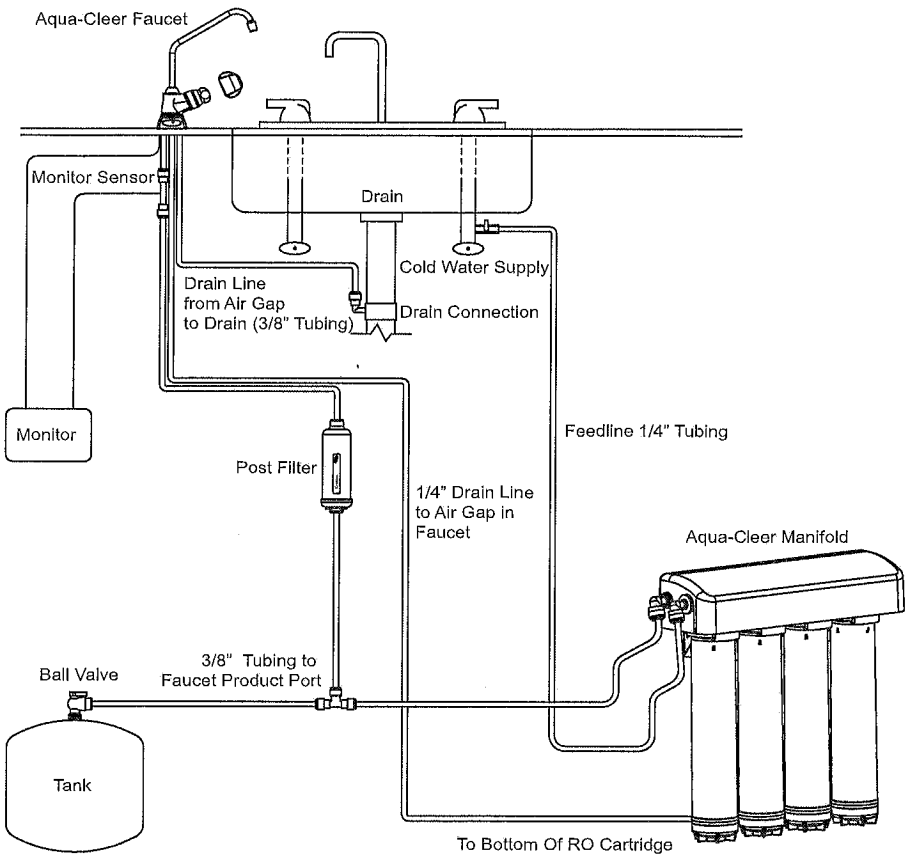
Arsenic (As) is found naturally in some well water. Arsenic in water has no color, taste or odor. It must be measured by a lab test. Public water utilities must have their water tested for arsenic. You can get the result from your water utility. If you have your own well, you can have the water tested by an accredited lab. The local health department or the state environmental health agency can provide a list of certified labs. Culligan International is one such lab. For more information please contact your local Culligan dealer. For additional information about the arsenic in water can be found through the EPA's website at www.epa.gov/safewater/arsenic.html.

There are two forms of arsenic: pentavalent arsenic (As (V)) and trivalent arsenic (As (III)). Special sampling procedures are needed for a lab to determine what type and how much of each type of arsenic is in the water. In well water, arsenic may be pentavalent, trivalent, or a combination of both. Reverse osmosis membranes are effective at reducing pentavalent arsenic but not trivalent arsenic. The Arsenic specific cartridge was specifically designed to reduce trivalent arsenic.

* Cartridges not for sale in California.



Installation



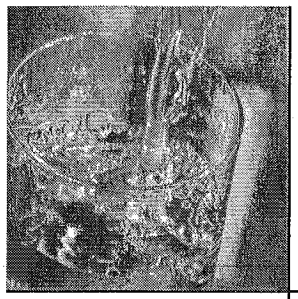
Note: *Install the drain line so that it runs downward with no loops or low spots. Otherwise the unit will overflow at the air gap siphon break built into the faucet, or make irritating gurgling sounds. The 1/4" concentrate line that leads to the faucet should be installed in a straight vertical path to avoid making a gurgling noise.* **For installations in Massachusetts: Massachusetts Plumbing Code 248 CMR shall be adhered to. Consult your licensed plumber for installation of this system. The use of saddle valves is not permitted in Massachusetts.**

This owner's guide provides visual assembly reference only. Since specialized skills are required in the assembly of the drinking water system, we recommend that you contact your local independently operated Culligan dealer to complete this installation.

Select Component Installation Locations

Dispenser Faucet

The Culligan® faucet is designed to be mounted on the rear lip of the sink. It may be installed in an existing sprayer attachment hole or in a hole drilled at the time of installation. It may also be mounted to an adjacent counter top. It should be positioned so that water is dispensed over the sink. A minimum 1-1/4" diameter hole is required. When installing the Aqua-Cleer® water quality monitor, refer to the installation instructions packaged with the monitor. Make certain the TDS level and/or gallons setting correspond to the desired water supply.



Installation (con't)

Important considerations:

- Access to the bottom (under sink) of the faucet is required for attachment of product water line.
- The faucet can be installed for left- or right-handed operation.
- There should be no under sink obstructions which would prevent smooth tubing runs to the drain connection, carbon post-filter, or RO module assembly.

Filter System Assembly

The filter system assembly is designed to be mounted on any rigid vertical surface such as a cabinet sidewall, sheetrock or exposed stud. It should be positioned such that there is access to an inlet water source and drain. The installation should also allow convenient access for servicing.

Inlet Water Supply Connection

Once a location is chosen for installation of the filter system assembly, select a nearby cold water line to provide the water source for the system. For under sink installations, the cold water faucet line can usually be tapped.

The Reservoir Tank

Position the reservoir tank near the faucet for optimum customer convenience. The standard and medium reservoir tank will weigh about 28 pounds (13 kg) when full of water, so it must be positioned on a stand or held securely by the optional mounting bracket. The reservoir operates best in the vertical position, but it will operate on its side. However, air will not escape readily and foaming may occur at the faucet nozzle. This should be explained to the customer prior to installation.

Drain Connection

The most convenient entry to the drain is directly above the P-trap of the kitchen sink. However, the concentrate water from the system can be connected to adjacent sinks or a floor drain. Extra care should be taken when entering drains near dishwashers or food waste disposals as back flow may occur through the air gap and cause flooding. See plumbing diagram on page 7 for proper air gap installation to waste connection.

Installation of Filter System Assembly

The mounting bracket contains three mounting slots. The holes are sized to accept #10 round head wood screws (not supplied). Some types of surfaces such as particle board or drywall may require the use of plastic screw anchors or toggle bolts to provide adequate support for the unit.

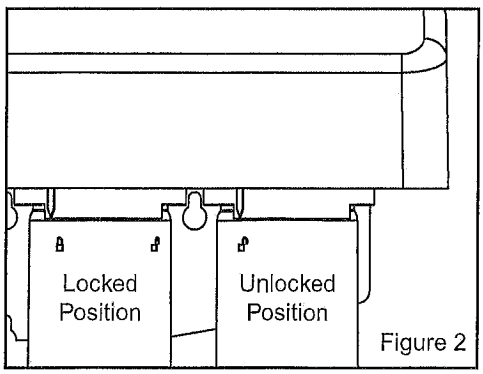
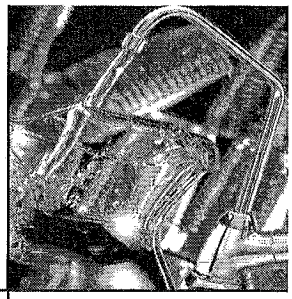


Figure 2

Install Filter Cartridges

1. Lightly lubricate the cartridge O-ring with silicone lube and insert the sediment filter cartridge into the manifold.
2. Twist the cartridge to lock it into the manifold. See Figure 2.



Installation (con't)

3. Repeat steps 1-3 and install the flushed activated carbon filter cartridge into housing and the RO membrane element. Be sure the drain adapter is in place.

Note:

1) The RO cartridge must be inserted into the 2nd, 3rd, or 4th position on the RO manifold.

2) If only three cartridges are to be inserted into the manifold, the bypass plug cartridge must be inserted in the 4th position. See Figure 3.

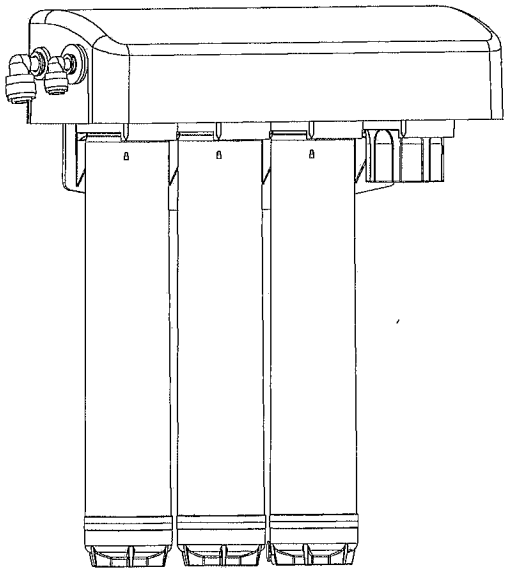


Figure 3

Factors Which Affect Performance

Performance of the reverse osmosis membrane is affected by several factors which must be considered when judging the condition of the system. The main factors which affect system performance are pressure, temperature, total dissolved solids level, recovery and pH.

Pressure

Water pressure affects both the quantity and quality of the water produced by the RO membrane. Generally, the more water pressure, the better the performance of the system. Be careful not to exceed 120 psi, the maximum operating pressure of the Aqua-Cleer system.

Temperature

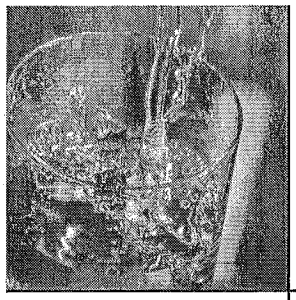
The reverse osmosis process slows with decreasing temperature. To compensate, a temperature correction factor is used to adjust the actual performance of the RO membrane filter to the standard temperature of 77°F (25°C). This allows the performance of the unit to be accurately gauged against Culligan's published standards. Temperature does not affect the concentrate flow rate.

Total Dissolved Solids

The minimum driving force which is necessary to stop or reverse the natural osmosis process is termed osmotic pressure. As the total dissolved solids level of the feed water increases, the amount of osmotic pressure increases and acts as back pressure against the reverse osmosis process. Osmotic pressure becomes significant at TDS levels above 500 mg/L (ppm).

Hardness

Hardness is the most common membrane foulant. If ignored, this relatively harmless



Installation (con't)

component of feed water will plug a membrane over time. Use of a softener will reduce the fouling effect on a membrane. One way to detect too much hardness in the feed water is the weight of a membrane installed for a period of time. A fouled membrane (dried) will weigh significantly more than a new membrane. The increase in weight is a result of precipitated hardness inside the membrane.

Iron

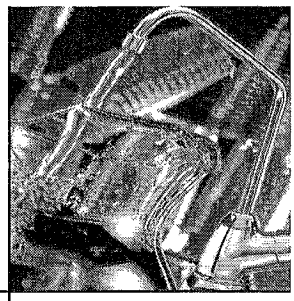
Iron is another common membrane foulant. There are a variety of types of iron, some of which cannot be removed by an iron filter. Clear water iron can be removed more effectively by a softener. Particulate iron can be removed more effectively by a 1 micron filter. Organic-bound iron can be removed only by activated carbon or macroporous anion resin. If there is enough iron to exceed the EPA secondary drinking water standard and softening the water is not an option and the iron is soluble, then an iron filter is appropriate. If none of these are an option then regular replacement of membranes will have to be accepted.

Product Water Recovery

Product water recovery plays an important role in determining membrane and system performance. Recovery refers to the amount of water produced in relation to the amount of water sent to drain. The standard calculation is:

$$\% \text{ Recovery} = \text{Product Water} \div (\text{Product Water} + \text{Waste Water}) \times 100$$

The Aqua-Cleer uses a flow control assembly to restrict the flow of waste water to the drain. This restriction helps maintain pressure against the membrane. The sizing of the flow control assembly determines the recovery rating of the system. The Aqua-Cleer is manufactured with a recovery rating designed to be around 30% -40%. Depending on temperature, pressure and tolerances the actual recovery value may be slightly different for each system.



How to Maintain Your System

To keep the Aqua-Cleer® system operating properly, it is necessary to change the filters and sanitize the system periodically. Typically, this should be done on an annual basis. Service frequency may vary depending on local water conditions. High sediment, chlorine, turbidity, or hardness levels may require more frequent service. Use the following as a guide.

As needed:

Clean the faucet with a soft cloth, avoid abrasive cleaners

It is recommended that you do the following annually:

1. Sanitize the System

2. Replace:

- Sediment Filter
- Activated Carbon Filter
- Polishing Filter
- Any Advanced Filtration Cartridge

3. Check:

- RO Membrane
- Flow control assembly
- TDS Reduction Performance
- Flow Rates (including air gap)
- Drain tubing for back-up

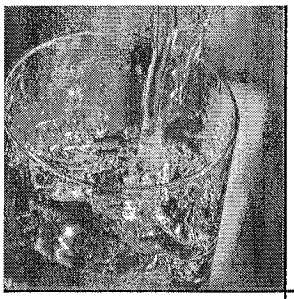
NOTE:

The activated carbon, reverse osmosis, and polishing filter cartridges must be conditioned as follows prior to installation into the Aqua-Cleer system. Your Culligan man will do these important procedures at the time of purchase.

- Activated Carbon Cartridge - 10 minute flush to remove carbon dust
- RO Membrane - Minimum 24 hour flush to remove preservative solution
- Polishing Filter - 10 minute flush to remove carbon dust

Perform the following steps in the order shown to sanitize your system

It is recommended to have your local Culligan dealer perform the sanitization process. Your local Culligan man has been specifically trained to test the water quality and efficiency of the system in order to determine when the RO membrane should be replaced and ensure the system is working properly.



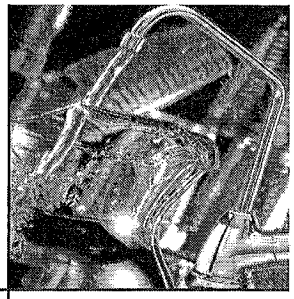
How to Maintain Your System (con't)

Preliminary Steps:

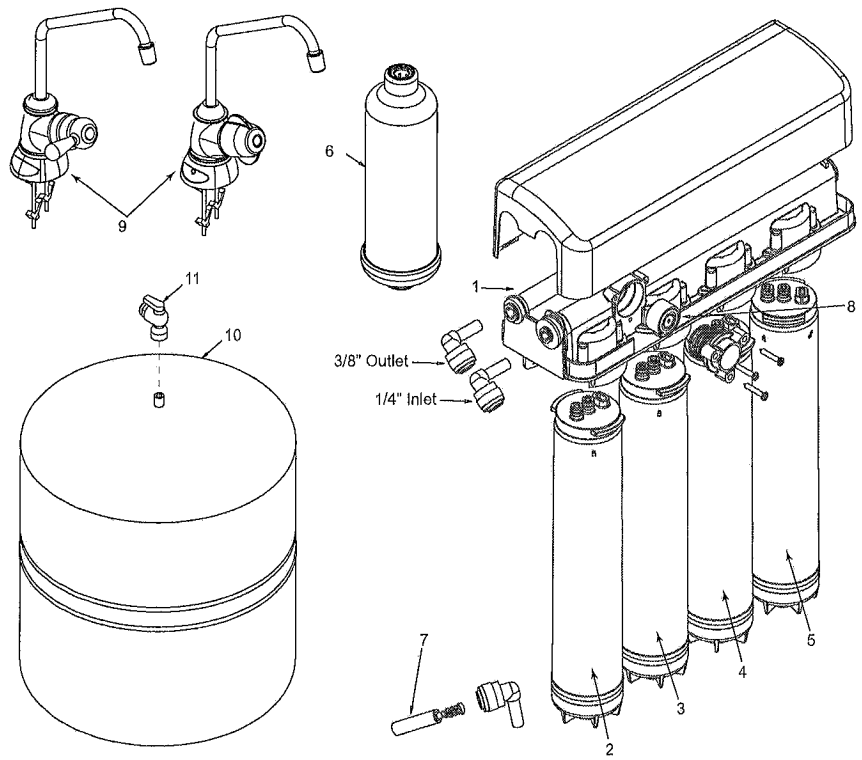
1. Check for any leaks that may exist from tubing connections or the faucet.
2. Check for flow to the drain. If flowing, close tank shut-off so you can check auto shut-off operation
3. Test and record product TDS from faucet. Also observe if faucet stem is stiff to move.
4. Test and record feed TDS, and then calculate rejection percentage.
5. If rejection is acceptable - Shut off storage tank, remove tank supply tubing to collect and record product flow, and water temperature.
6. Record feed pressure if needed by attaching a pressure gauge to feed line. Use the recorded feed pressure and water temperature to check product flow rate against the supplied chart. Membrane okay? Low production could be the result of partially plugged prefilters. If so retest after filters are changed.
7. With feed line off begin draining tank.

The Aqua-Cleer RO manifold assembly may be sanitized with 5-1/4% liquid chlorine unscented bleach.

1. Shut off water supply then remove all filters. Put bypass plugs in ports 2, 3 and 4.
2. Pour two tablespoons liquid chlorine bleach into the sanitizer cartridge and place in port 1.
3. Turn on the water supply valve and the RO faucet to allow the system to fill with water. Allow the water to flow through until the entire system for about 10 minutes or until the sanitizing solution is through.
4. Install new filters, including the post carbon filter, and membrane if needed, or reuse existing membrane. Some filters require flushing before use to remove dust and fines. If an in-plant flush was not performed, use the single head assembly to perform this using the feed line and drain lines available. Don't flush using the RO manifold.
5. Replace the battery in the quality monitor if applicable.
6. Discard the first glass of water from the faucet.
7. Thoroughly check for leaks.

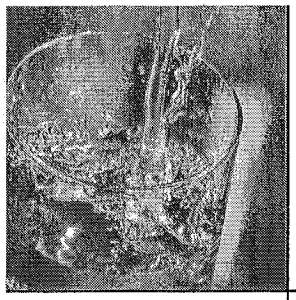


Parts List



Item	Description
1	Manifold Assembly
2	SED1 Filter
	SED2 Filter
	SED3 Filter
3	Carbon Block Filter
	Granular Activated Carbon Filter
	Granular Activated Carbon Filter - Large
4	30 GPD Reverse Osmosis Membrane
	50 GPD Reverse Osmosis Membrane**
	Nanofiltration Reverse Osmosis Membrane*†
5	Arsenic Filter
	Perchlorate Filter**
	Carbon Block Filter (MTBE, VOC)
6	Post Carbon Filter
7	Flow Control
8	Automatic Shut-off Valve
9	Faucet
10	2 Gallon Storage Tank
	3 Gallon Storage Tank
	9 Gallon Storage Tank
11	Ball Valve

*Monitor (Not Shown) **Cartridges not for sale in California
† Cartridge not for sale in California or Iowa.



Performance Data Sheet

Important Notice: Read this Performance Data Sheet and compare the capabilities of this system with your actual water treatment needs. It is recommended that, before installing a water treatment system, you have your water supply tested to determine your actual water treatment needs.

Culligan knows the more informed you are about your water treatment systems, the more confident you will be about its performance. It's because of this and more than seventy years of commitment to customer satisfaction that Culligan is providing this Performance Data Sheet to its customers.

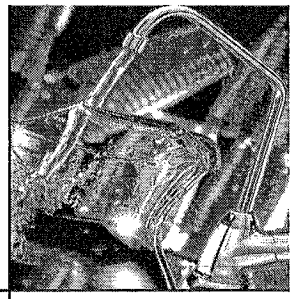
Company: **Culligan International Company**
9399 West Higgins Road, Suite 1100
Rosemont, IL 60018 USA
(847) 430-2800

Product: Culligan Aqua-Cleer Advanced Drinking Water Systems

Use Guidelines:

- Working Pressure: 40 – 120 psig (280-827 kPa)
- Do not allow exposure to temperature below 33°F (1°C)
- Maximum operating temperature: 100°F (38°C)
- These systems must be installed according to local plumbing codes on the cold water line.
- This system requires regular replacement of all filters to maintain proper operation. Depending on usage and influent water quality, the carbon and particulate filters should be changed at least annually and the reverse osmosis membrane should be replaced every 3-5 years. Varying chlorine, sediment or TDS levels may affect replacement frequency.

CAUTION! Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. Systems certified for cyst reduction may be used on disinfected water that may contain filterable cysts.



Performance Data Sheet (con't)

Carbon Block (CB)

The Carbon Block pre-filter has been tested according to NSF/ANSI 42 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42.

Substance	Influent Challenge Concentration	Maximum Permissible Product water Concentration	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	97.6%	97.3%

Granular Activated Carbon (GAC)

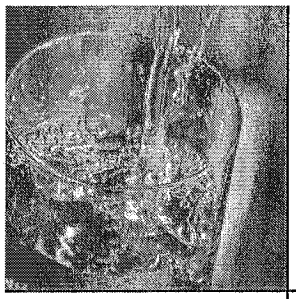
The Granular Activated Carbon has been tested according to NSF/ANSI 42 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42.

Substance	Influent Challenge Concentration	Maximum Permissible Product water Concentration	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	79.4%	64.4%

Granular Activated Carbon - Large (GAC-L)

The Granular Activated Carbon - Large has been tested according to NSF/ANSI 42 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42.

Substance	Influent Challenge Concentration	Maximum Permissible Product water Concentration	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	86.1%	80.3%

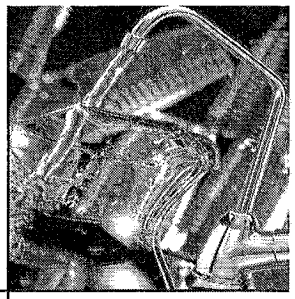


Performance Data Sheet (con't)

Total Defense (TD)
The Total Defense has been tested according to NSF/ANSI 42 and 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42 and 53.

Substance	Influent Challenge Concentration	Maximum Permissible Product water Concentration	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	97.6%	98.0%
Aesthetic Chloramines	3.0 mg/L + 10%	0.5 mg/L		97.6%	98.0%
Particulate (0.5 - < um) Class I	At least 10,000 particles/mL		>85%	99.9%	99.9%
Standard 53					
MTBE	0.015 + 20%	0.005 mg/L		74.6%	83.3%
Cyst [t]	Minimum 50,000/L		99.95%	99.99%	99.99%
Turbidity	11 mg/L + 1 NTU	0.5 NTU		96.6%	98.0%
Lead (pH 6.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Lead (pH 8.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Mercury (pH 6.5)	0.006 mg/L + 10%	0.002 mg/L		96.6%	96.6%
Mercury (pH 8.5)	0.006 mg/L + 10%	0.002 mg/L		72.4%	95.4%
Chloro-form (VOC surrogate chemical)	0.300 mg/L + 10%	0.015 mg/L		95.2%	91.0%

Flow Rate = 0.5 gpm (1.89 Lpm)
Capacity = 1,000 gallons (3786 L)
t Based on the use of microspheres or Cryptosporidium parvum oocysts
Testing was performed under standard laboratory conditions, actual performance may vary.

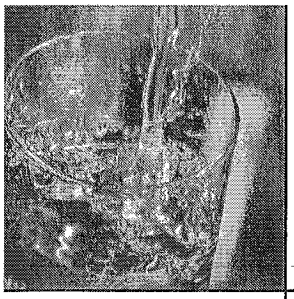


Performance Data Sheet (con't)

Organic Chemicals Included in Surrogate Testing:

Applies to Total Defense (TD) only.

Substance	Influent Challenge Concentration mg/L	Maximum permissible product water concentration mg/L
Alachor	0.050	0.001
Atrazine	0.100	0.003
Benzene	0.081	0.001
Carbofuran	0.190	0.001
Carbon Tetrachloride	0.078	0.002
Chlorbenzene	0.077	0.001
Chlorpicrin	0.015	0.000
2,4-d	0.110	0.002
Dibromochloropropane (Dbcp)	0.052	0.000
O-Dichlorobenzene	0.080	0.001
P-Dichlorobenzene	0.040	0.001
1,2-Dichloroethane	0.088	0.005
1,1-Dichloroethylene	0.083	0.001
Cis-1,2-Dichloroethylene	0.170	0.001
Trans-1,2-Dichloroethylene	0.086	0.001
1,2-Dichloropropane	0.080	0.001
Cis-1,3-Dichloropropylene	0.079	0.001
Dinoseb	0.170	0.000
Endrin	0.053	0.001
Ethylbenzene	0.088	0.001
Ethylene Dibromide (Edb)	0.044	0.000
Haloacetonitriles (Han):		
Bromochloroacetonitrile	0.022	0.001
Dibromoacetonitrile	0.024	0.001
Dichloroacetonitrile	0.001	0.000
Trichloracetonitrile	0.015	0.000
Haloketones (Hk):		
1,1-Dichloro-2-propane	0.007	0.000
1,1,1-Trichloro-2-propane	0.008	0.000
Heptachlor	0.250	0.000
Heptachlor Epoxide	0.011	0.000
Hexachlorobutadiene	0.044	0.001
Hexachlorocyclopentadiene	0.060	0.000
Lindane	0.055	0.000
Methoxychlor	0.050	0.000
Pentachloophenol	0.096	0.001
Simazine	0.120	0.004

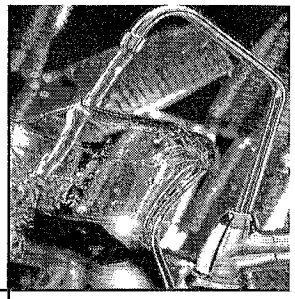


Performance Data Sheet (con't)

Organic Chemicals Included in Surrogate Testing (Continued):

Applies to Total Defense (TD) only.

Substance	Influent Challenge Concentration mg/L	Maximum permissible product water concentration mg/L
Styrene	0.150	0.001
1,1,2,2-Tetrachloroethane	0.081	0.001
Tetrachloroethylene	0.081	0.001
Toluene	0.078	0.001
2,4,5-tp (Silvex)	0.270	0.002
Tribromoacetic Acid	0.042	0.001
1,2,4-Trichlorobenzene	0.160	0.001
1,1,1-Trichloroethane	0.084	0.005
1,1,2-Trichloroethane	0.150	0.001
Trichloroethylene	0.180	0.001
Trihalomethanes (Includes):		
Chloroform (Surrogate Chemical)		
Bromoform	0.300	0.015
Bromodichloromethane		
Chlorodibromomethane		
Xylenes (Total)	0.070	0.001



Performance Data Sheet (con't)

RO30

This system has been tested according to NSF/ANSI 58 for the reduction of the substances listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 58.

This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Con-centration mg/L	Reduction Require-ments	Minimum Reduction	Average Reduction
Arsenic (Pentavalent)[2]	0.050 +/- 10%	0.01			97.4%
Barium	10.0 +/- 10%	2			98.3%
Cadmium	0.03 +/- 10%	0.005			98.7%
Hexavalent Chromium	0.30 +/- 10%	0.05			91.2%
Trivalent Chromium	0.30 +/- 10%	0.05			97.8%
Copper	3.00 +/- 10%	1.3			98.9%
Fluoride	8.0 +/- 10%	1.5			95.6%
Lead	0.15 +/- 10%	0.010			98.7%
Nitrate/Nitrite (both as N)	30 +/- 10%			82.8%	86.4%
Nitrate[5]	27.0 +/- 10%	10.0		82.7%	86.5%
Nitrite	3.0 +/- 10%	1.0		80.9%	84.7%
Radium 226/228[3]	25pCi/L +/- 10%	5pCi/L			80.0%
Selenium	0.10 +/- 10%	0.05			96.0%
Cyst[4]	>50,000/mL		99.95%	99.99%	99.99%
Turbidity	11 +/- 1 NTU	0.5 NTU			99.00%

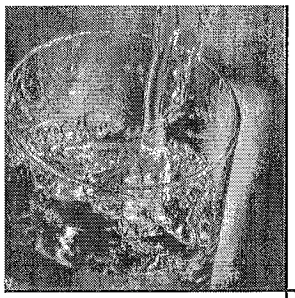
1 While testing was performed under standard laboratory conditions, actual performance may vary depending on water pressure, temperatures and other substances, which may be found in your water.

2 This system has been tested for the treatment of water containing pentavalent arsenic (also known as As(V), As(+5) or arsenate) at concentrations of 0.050 mg/L or less. This system reduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual at the system inlet or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramines (combined chlorine) is not sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Facts Sheet for further information.

3 Based upon testing methods using Barium as a surrogate. All concentrations in pCi/L pico curie/L.

4 Includes Giardia lamblia, Entamoeba histolyca and Cryptosporidium.

5 Units are not certified on water supplies with a pressure less than 40 psi (280 kPa). A booster pump is strongly recommended.



Performance Data Sheet (con't)

RO30 with TD

These systems have been tested and certified by NSF International according to NSF/ANSI 42, 53, and 58 for the reduction of the substances listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42, 53, and 58.

This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Arsenic (pentavalent)[2]	0.050 +/- 10%	0.01			97.4%
Barium	10.0 +/- 10%	2			98.3%
Cadmium	0.03 +/- 10%	0.005			98.7%
Hexavalent Chromium	0.30 +/- 10%	0.05			91.2%
Trivalent Chromium	0.30 +/- 10%	0.05			97.8%
Copper	3.00 +/- 10%	1.3			98.9%
Fluoride	8.0 +/- 10%	1.5			95.6%
Lead	0.15 +/- 10%	0.010			98.7%
Nitrate/Nitrite (both as N)	30 +/- 10%			83.1%	86.8%
Nitrate[5]	27.0 +/- 10%	10.0		83.4%	87.0%
Nitrite	3.0 +/- 10%	1.0		79.5%	84.8%
Radium 226/2283	25pCi/L +/- 10%	5pCi/L			80.0%
Selenium	0.10 +/- 10%	0.05			96.0%
Cyst[4]	>50,000/mL		99.95%	99.99%	99.99%
Turbidity	11 +/- 1 NTU	0.5 NTU			99.00%

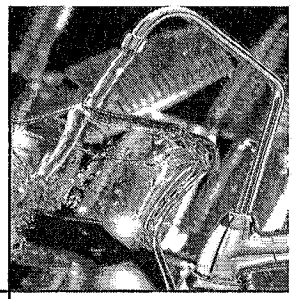
1 While testing was performed under standard laboratory conditions, actual performance may vary depending on water pressure, temperatures and other substances, which may be found in your water.

2 This system has been tested for the treatment of water containing pentavalent arsenic (also known as As(V), As(+5) or arsenate) at concentrations of 0.050 mg/L or less. This system reduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual at the system inlet or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramines (combined chlorine) is not sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Facts Sheet for further information.

3 Based upon testing methods using Barium as a surrogate. All concentrations in pCi/L pico curie/L.

4 Includes Giardia lamblia, Entamoeba histolyca and Cryptosporidium.

5 Units are not certified on water supplies with a pressure less than 40 psi (280 kPa). A booster pump is strongly recommended.



Performance Data Sheet (con't)

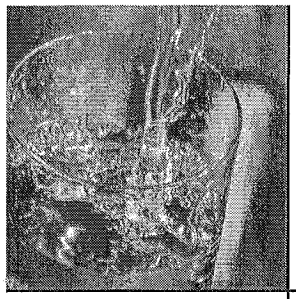
Total Defense (TD)

The Total Defense has been tested according to NSF/ANSI 42 and 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42 and 53.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	97.6%	98.0%
Aesthetic Chloramines	3.0 mg/L + 10%	0.5 mg/L		97.6%	98.0%
Particulate (0.5 - < um) Class I	at least 10,000 particles/mL		>85%	99.9%	99.9%
Standard 53					
MTBE	0.015 + 20%	0.005 mg/L		74.6%	83.3%
Cyst [t]	Minimum 50,000/L		99.95%	99.99%	99.99%
Turbidity	11 mg/L + 1 NTU	0.5 NTU		96.6%	98.0%
Lead (pH 6.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Lead (pH 8.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Mercury (pH 6.5)	0.006 mg/L + 10%	0.002 mg/L		96.6%	96.6%
Mercury (pH 8.5)	0.006 mg/L + 10%	0.002 mg/L		72.4%	95.4%
Chloroform (VOC surrogate chemical)	0.300 mg/L + 10%	0.015 mg/L		95.2%	91.0%

Flow Rate = 0.5 gpm (1.89 Lpm)
Capacity = 1,000 gallons (3786 L)
t Based on the use of microspheres or Cryptosporidium parvum oocysts
Testing was performed under standard laboratory conditions, actual performance may vary
Organic Chemicals Included in Surrogate Testing:
Applies to Total Defense (TD) only

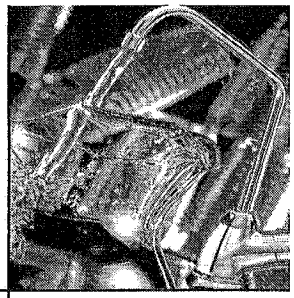


Performance Data Sheet (con't)

Organic Chemicals Included in Surrogate Testing:

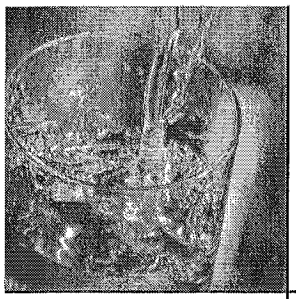
Applies to Total Defense (TD) only.

Substance	Influent Challenge Concentration mg/L	Maximum permissible product water concentration mg/L
alachor	0.050	0.001
atrazine	0.100	0.003
benzene	0.081	0.001
carbofuran	0.190	0.001
carbon tetrachloride	0.078	0.002
chlorbenzene	0.077	0.001
chlorpicrin	0.015	0.000
2,4-D	0.110	0.002
dibromochloropropane (DBCP)	0.052	0.000
o-dichlorobenzene	0.080	0.001
p-dichlorobenzene	0.040	0.001
1,2-dichloroethane	0.088	0.005
1,1-dichloroethylene	0.083	0.001
cis-1,2-dichloroethylene	0.170	0.001
trans-1,2-dichloroethylene	0.086	0.001
1,2-dichloropropane	0.080	0.001
cis-1,3dichloropropylene	0.079	0.001
dinoseb	0.170	0.000
endrin	0.053	0.001
ethylbenzene	0.088	0.001
ethylene dibromide (EDB)	0.044	0.000
haloacetonitriles (HAN):		
bromochloroacetonitrile	0.022	0.001
dibromoacetonitrile	0.024	0.001
dichloroacetonitrile	0.001	0.000
trichloracetonitrile	0.015	0.000
haloketones (HK):		
1,1-dichloro-2-propane	0.007	0.000
1,1,1-trichloro-2-propane	0.008	0.000
heptachlor	0.250	0.000
heptachlor epoxide	0.011	0.000
hexachlorobutadiene	0.044	0.001
hexachlorocyclopentadiene	0.060	0.000
lindane	0.055	0.000
methoxychlor	0.050	0.000
pentachloophenol	0.096	0.001



Performance Data Sheet (con't)

Substance	Influent Challenge Concentration mg/L	Maximum permissible product water concentration mg/L
simazine	0.120	0.004
styrene	0.150	0.001
1,1,2,2-tetrachloroethane	0.081	0.001
tetrachloroethylene	0.081	0.001
toluene	0.078	0.001
2,4,5-TP (silvex)	0.270	0.002
tribromoacetic acid	0.042	0.001
1,2,4-trichlorobenzene	0.160	0.001
1,1,1-trichloroethane	0.084	0.005
1,1,2-trichloroethane	0.150	0.001
trichloroethylene	0.180	0.001
trihalomethanes (includes):		
chloroform (surrogate chemical)		
bromoform	0.300	0.015
bromodichloromethane		
chlorodibromomethane		
xylenes (total)	0.070	0.001



Performance Data Sheet (con't)

RO30 with AS3

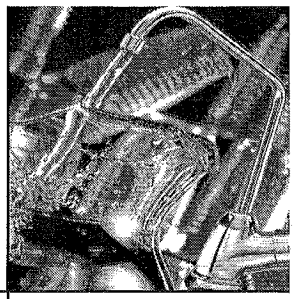
These systems have been tested and certified by NSF International according to NSF/ANSI 53 and 58 for the reduction of the substances listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 53 and 58.

This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Con-centration mg/L	Reduction Require-ments	Minimum Reduction	Average Reduction
Arsenic (pentavalent)[2]	0.050 +/- 10%	0.01			97.4%
Barium	10.0 +/- 10%	2			98.3%
Cadmium	0.03 +/- 10%	0.005			98.7%
Hexavalent Chromium	0.30 +/- 10%	0.05			91.2%
Trivalent Chromium	0.30 +/- 10%	0.05			97.8%
Copper	3.00 +/- 10%	1.3			98.9%
Fluoride	8.0 +/- 10%	1.5			95.6%
Lead	0.15 +/- 10%	0.010			98.7%
Nitrate/Nitrite (both as N)	30 +/- 10%			83.1%	86.8%
Nitrate5	27.0 +/- 10%	10.0		83.4%	87.0%
Nitrite	3.0 +/- 10%	1.0		79.5%	84.8%
Radium 226/2283	25pCi/L +/- 10%	5pCi/L			80.0%
Selenium	0.10 +/- 10%	0.05			96.0%
Cyst[4]	>50,000/mL		99.95%	99.99%	99.99%
Turbidity	11 +/- 1 NTU	0.5 NTU			99.00%

1 While testing was performed under standard laboratory conditions, actual performance may vary depending on water pressure, temperatures and other substances, which may be found in your water.
2 This system has been tested for the treatment of water containing pentavalent arsenic (also known as As(V), As(+5) or arsenate) at concentrations of 0.050 mg/L or less. This system reduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual at the system inlet or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramines (combined chlorine) is not sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Facts Sheet for further information.
3 Based upon testing methods using Barium as a surrogate. All concentrations in pCi/L pico curie/L.
4 Includes Giardia lamblia, Entamoeba histolyca and Cryptosporidium.
5 Units are not certified on water supplies with a pressure less than 40 psi (280 kPa). A booster pump is strongly recommended.



Performance Data Sheet (con't)

AS3

The AS3 has been tested according to NSF/ANSI 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 53. Conforms to NSF/ANSI Standard 53 for arsenic (trivalent and pentavalent) reduction. See Arsenic Fact section for an explanation of reduction performance.

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 53					
Trivalent Arsenic pH 6.5	0.050 + 10%	0.010			94.9%
Trivalent Arsenic pH 8.5	0.050 + 10%	0.010			98.0%
Pentavalent Arsenic	0.050 + 10%	0.010			97.4%

Flow Rate = 0.035 gpm (0.13 Lpm)
Capacity = 1000 gallons (3786 L)
1000 gallon capacity is only for use with PID
Testing was performed under standard laboratory conditions, actual performance may vary

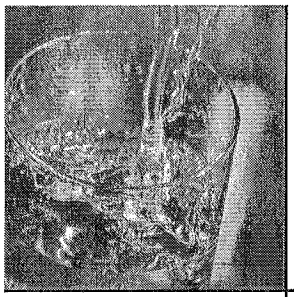
RO30 with AS3, TD

These systems have been tested and certified by NSF International according to NSF/ANSI 42, 53, and 58 for the reduction of the substances listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42, 53, and 58.

This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Arsenic (pentavalent)[2]	0.050 +/- 10%	0.01			97.4%
Barium	10.0 +/- 10%	2			98.3%
Cadmium	0.03 +/- 10%	0.005			98.7%
Hexavalent Chromium	0.30 +/- 10%	0.05			91.2%
Trivalent Chromium	0.30 +/- 10%	0.05			97.8%
Copper	3.00 +/- 10%	1.3			98.9%



Performance Data Sheet (con't)

RO30 with AS3, TD (continued)					
Fluoride	8.0 +/- 10%	1.5			95.6%
Lead	0.15 +/- 10%	0.010			98.7%
Nitrate/Nitrite (both as N)	30 +/- 10%			83.1%	86.8%
Nitrate[5]	27.0 +/- 10%	10.0		83.4%	87.0%
Nitrite	3.0 +/- 10%	1.0		79.5%	84.8%
Radium 226/2283	25pCi/L +/- 10%	5pCi/L			80.0%
Selenium	0.10 +/- 10%	0.05			96.0%
Cyst[4]	>50,000/mL		99.95%	99.99%	99.99%
Turbidity	11 +/- 1 NTU	0.5 NTU			99.00%

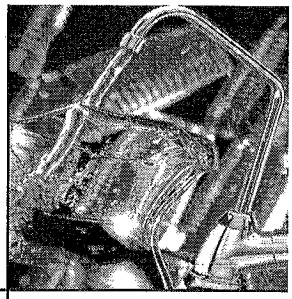
1 While testing was performed under standard laboratory conditions, actual performance may vary depending on water pressure, temperatures and other substances, which may be found in your water.
2 This system has been tested for the treatment of water containing pentavalent arsenic (also known as As(V), As(+5) or arsenate) at concentrations of 0.050 mg/L or less. This system reduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual at the system inlet or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramines (combined chlorine) is not sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Facts Sheet for further information.
3 Based upon testing methods using Barium as a surrogate. All concentrations in pCi/L pico curie/L.
4 Includes Giardia lamblia, Entamoeba histolyca and Cryptosporidium.
5 Units are not certified on water supplies with a pressure less than 40 psi (280 kPa). A booster pump is strongly recommended.

AS3

The AS3 has been tested according to NSF/ANSI 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 53. Conforms to NSF/ANSI Standard 53 for arsenic (trivalent and pentavalent) reduction. See Arsenic Fact section for an explanation of reduction performance.

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 53					
Trivalent Arsenic pH 6.5	0.050 + 10%	0.010			94.9%
Trivalent Arsenic pH 8.5	0.050 + 10%	0.010			98.0%
Pentavalent Arsenic	0.050 + 10%	0.010			97.4%

Flow Rate = 0.035 gpm (0.13 Lpm)
Capacity = 1000 gallons (3786 L)
1000 gallon capacity is only for use with PID
Testing was performed under standard laboratory conditions, actual performance may vary



Performance Data Sheet (con't)

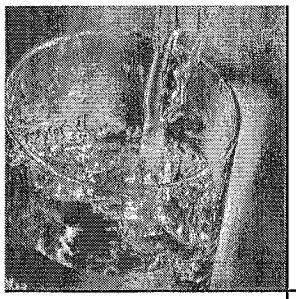
Total Defense (TD)

The Total Defense has been tested according to NSF/ANSI 42 and 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42 and 53.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	97.6%	98.0%
Aesthetic Chloramines	3.0 mg/L + 10%	0.5 mg/L		97.6%	98.0%
Particulate (0.5 - < um) Class I	at least 10,000 particles/mL		>85%	99.9%	99.9%
Standard 53					
MTBE	0.015 + 20%	0.005 mg/L	69%	74.6%	83.3%
Cyst [t]	Minimum 50,000/L		99.95%	99.95%	99.99%
Turbidity	11 mg/L + 1 NTU	0.5 NTU		96.6%	98.0%
Lead (pH 6.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Lead (pH 8.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Mercury (pH 6.5)	0.006 mg/L + 10%	0.002 mg/L		96.6%	96.6%
Mercury (pH 8.5)	0.006 mg/L + 10%	0.002 mg/L		72.4%	95.4%
Chloroform (VOC surrogate chemical)	0.300 mg/L + 10%	0.015 mg/L		95.2%	91.0%

Flow Rate = 0.5 gpm (1.89 Lpm)
Capacity = 1,000 gallons (3786 L)
t Based on the use of microspheres or Cryptosporidium parvum oocysts
Testing was performed under standard laboratory conditions, actual performance may vary
Organic Chemicals Included in Surrogate Testing:
Applies to Total Defense (TD) only

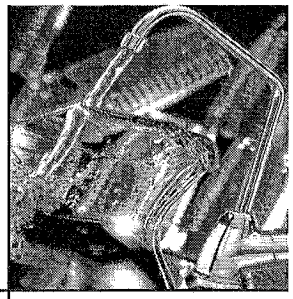


Performance Data Sheet (con't)

Organic Chemicals Included in Surrogate Testing:

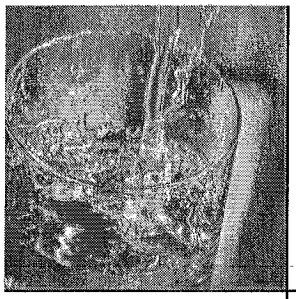
Applies to Total Defense (TD) only.

Substance	Influent Challenge Concentration mg/L	Maximum permissible product water concentration mg/L
alachor	0.050	0.001
atrazine	0.100	0.003
benzene	0.081	0.001
carbofuran	0.190	0.001
carbon tetrachloride	0.078	0.002
chlorbenzene	0.077	0.001
chlorpicrin	0.015	0.000
2,4-D	0.110	0.002
dibromochloropropane (DBCP)	0.052	0.000
o-dichlorobenzene	0.080	0.001
p-dichlorobenzene	0.040	0.001
1,2-dichloroethane	0.088	0.005
1,1-dichloroethylene	0.083	0.001
cis-1,2-dichloroethylene	0.170	0.001
trans-1,2-dichloroethylene	0.086	0.001
1,2-dichloropropane	0.080	0.001
cis-1,3dichloropropylene	0.079	0.001
dinoseb	0.170	0.000
endrin	0.053	0.001
ethylbenzene	0.088	0.001
ethylene dibromide (EDB)	0.044	0.000
haloacetonitriles (HAN):		
bromochloroacetonitrile	0.022	0.001
dibromoacetonitrile	0.024	0.001
dichloroacetonitrile	0.001	0.000
trichloracetonitrile	0.015	0.000
haloketones (HK):		
1,1-dichloro-2-propane	0.007	0.000
1,1,1-trichloro-2-propane	0.008	0.000
heptachlor	0.250	0.000
heptachlor epoxide	0.011	0.000
hexachlorobutadiene	0.044	0.001
hexachlorocyclopentadiene	0.060	0.000
lindane	0.055	0.000
methoxychlor	0.050	0.000
pentachloophenol	0.096	0.001



Performance Data Sheet (con't)

Substance	Influent Challenge Concentration mg/L	Maximum permissible product water concentration mg/L
simazine	0.120	0.004
styrene	0.150	0.001
1,1,2,2-tetrachloroethane	0.081	0.001
tetrachloroethylene	0.081	0.001
toluene	0.078	0.001
2,4,5-TP (silvex)	0.270	0.002
tribromoacetic acid	0.042	0.001
1,2,4-trichlorobenzene	0.160	0.001
1,1,1-trichloroethane	0.084	0.005
1,1,2-trichloroethane	0.150	0.001
trichloroethylene	0.180	0.001
trihalomethanes (includes):		
chloroform (surrogate chemical)		
bromoform	0.300	0.015
bromodichloromethane		
chlorodibromomethane		
xylenes (total)	0.070	0.001



Performance Data Sheet (con't)

RO50*

This system has been tested according to NSF/ANSI 58 for the reduction of the substances listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 58.

This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Require-ments	Minimum Reduction	Average Reduction
Arsenic (Pentavalent)[2]	0.30 +/- 10%	0.01			99.3%
Barium	10.0 +/- 10%	2			98.5%
Cadmium	0.03 +/- 10%	0.005			98.1%
Hexavalent Chromium	0.30 +/- 10%	0.05			97.7%
Trivalent Chromium	0.30 +/- 10%	0.05			99.0%
Copper	3.00 +/- 10%	1.3			98.7%
Fluoride	8.0 +/- 10%	1.5			95.5%
Lead	0.15 +/- 10%	0.010			98.1%
Nitrate/Nitrite (both as N)	30 +/- 10%			65.9%	68.9%
Nitrate[5]	27.0 +/- 10%	10.0		66.2%	68.5%
Nitrite	3.0 +/- 10%	1.0		65.5%	69.8%
Radium 226/228[3]	25pCi/L +/- 10%	5pCi/L			80.0%
Selenium	0.10 +/- 10%	0.05			94.0%
Cyst[4]	>50,000/mL		99.95%	99.99%	99.99%
Turbidity	11 +/- 1 NTU	0.5 NTU			99.3%

1 While testing was performed under standard laboratory conditions, actual performance may vary depending on water pressure, temperatures and other substances, which may be found in your water.

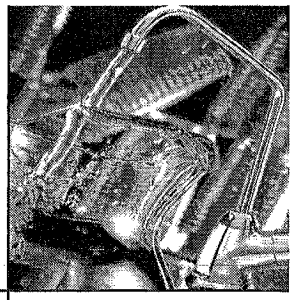
2 This system has been tested for the treatment of water containing pentavalent arsenic (also known as As(V), As(+5) or arsenate) at concentrations of 0.30 mg/L or less. This system reduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual at the system inlet or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramines (combined chlorine) is not sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Facts Sheet for further information.

3 Based upon testing methods using Barium as a surrogate. All concentrations in pCi/L pico curie/L.

4 Includes Giardia lamblia, Entamoeba histolyca and Cryptosporidium.

5 Units are not certified on water supplies with a pressure less than 40 psi (280 kPa). A booster pump is strongly recommended.

*RO50 not for sale in California.



Performance Data Sheet (con't)

RO50* with TD

These systems have been tested and certified by NSF International according to NSF/ANSI 42, 53, and 58 for the reduction of the substances listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42, 53, and 58.

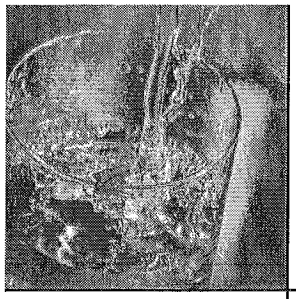
This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Require-ments	Minimum Reduction	Average Reduction
Arsenic (pen-tavalent)2	0.30 +/- 10%	0.01			99.3%
Barium	10.0 +/- 10%	2			98.5%
Cadmium	0.03 +/- 10%	0.005			98.1%
Hexavalent Chromium	0.30 +/- 10%	0.05			97.7%
Trivalent Chro-mium	0.30 +/- 10%	0.05			99.0%
Copper	3.00 +/- 10%	1.3			98.7%
Fluoride	8.0 +/- 10%	1.5			95.5%
Lead	0.15 +/- 10%	0.010			98.1%
Nitrate/Nitrite (both as N)	30 +/- 10%			65.9%	68.9%
Nitrate5	27.0 +/- 10%	10.0		66.2%	68.5%
Nitrite	3.0 +/- 10%	1.0		65.5%	69.8%
Radium 226/2283	25pCi/L +/- 10%	5pCi/L			80.0%
Selenium	0.10 +/- 10%	0.05			94.0%
Cyst4	>50,000/mL		99.95%	99.99%	99.99%
Turbidity	11 +/- 1 NTU	0.5 NTU			99.3%

1 While testing was performed under standard laboratory conditions, actual performance may vary depending on water pressure, temperatures and other substances, which may be found in your water.
2 This system has been tested for the treatment of water containing pentavalent arsenic (also known as As(V), As(+5) or arsenate) at concentrations of 0.30 mg/L or less. This system reduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual at the system inlet or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramines (combined chlorine) is not sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Facts Sheet for further information.
3 Based upon testing methods using Barium as a surrogate. All concentrations in pCi/L pico curie/L.
4 Includes Giardia lamblia, Entamoeba histolyca and Cryptosporidium.
5 Units are not certified on water supplies with a pressure less than 40 psi (280 kPa). A booster pump is strongly recommended.

*RO50 not for sale in California.



Performance Data Sheet (con't)

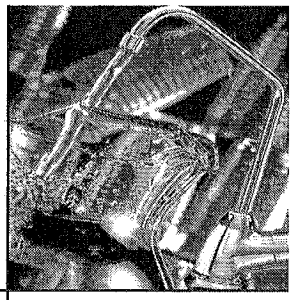
Total Defense (TD)

The Total Defense has been tested according to NSF/ANSI 42 and 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42 and 53.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	97.6%	98.0%
Aesthetic Chloramines	3.0 mg/L + 10%	0.5 mg/L		97.6%	98.0%
Particulate (0.5 - < um) Class I	at least 10,000 particles/mL		>85%	99.9%	99.9%
Standard 53					
MTBE	0.015 + 20%	0.005 mg/L	69%	74.6%	83.3%
Cyst t	Minimum 50,000/L		99.95%	99.95%	99.99%
Turbidity	11 mg/L + 1 NTU	0.5 NTU		96.6%	98.0%
Lead (pH 6.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Lead (pH 8.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Mercury (pH 6.5)	0.006 mg/L + 10%	0.002 mg/L		96.6%	96.6%
Mercury (pH 8.5)	0.006 mg/L + 10%	0.002 mg/L		72.4%	95.4%
Chloroform (VOC surrogate chemical)	0.300 mg/L + 10%	0.015 mg/L		95.2%	91.0%

Flow Rate = 0.5 gpm (1.89 Lpm)
Capacity = 1,000 gallons (3786 L)
t Based on the use of microspheres or Cryptosporidium parvum oocysts
Testing was performed under standard laboratory conditions, actual performance may vary
Organic Chemicals Included in Surrogate Testing:

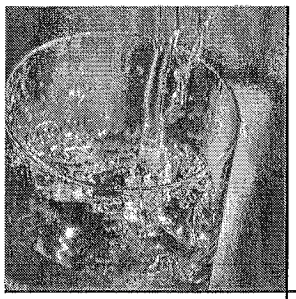


Performance Data Sheet (con't)

Organic Chemicals Included in Surrogate Testing:

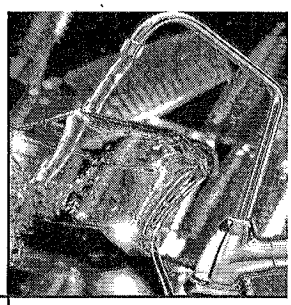
Applies to Total Defense (TD) only.

Substance	Influent Challenge Concentration mg/L	Maximum permissible product water concentration mg/L
alachor	0.050	0.001
atrazine	0.100	0.003
benzene	0.081	0.001
carbofuran	0.190	0.001
carbon tetrachloride	0.078	0.002
chlorbenzene	0.077	0.001
chlorpicrin	0.015	0.000
2,4-D	0.110	0.002
dibromochloropropane (DBCP)	0.052	0.000
o-dichlorobenzene	0.080	0.001
p-dichlorobenzene	0.040	0.001
1,2-dichloroethane	0.088	0.005
1,1-dichloroethylene	0.083	0.001
cis-1,2-dichloroethylene	0.170	0.001
trans-1,2-dichloroethylene	0.086	0.001
1,2-dichloropropane	0.080	0.001
cis-1,3dichloropropylene	0.079	0.001
dinoseb	0.170	0.000
endrin	0.053	0.001
ethylbenzene	0.088	0.001
ethylene dibromide (EDB)	0.044	0.000
haloacetonitriles (HAN):		
bromochloroacetonitrile	0.022	0.001
dibromoacetonitrile	0.024	0.001
dichloroacetonitrile	0.001	0.000
trichloracetonitrile	0.015	0.000
haloketones (HK):		
1,1-dichloro-2-propane	0.007	0.000
1,1,1-trichloro-2-propane	0.008	0.000
heptachlor	0.250	0.000
heptachlor epoxide	0.011	0.000
hexachlorobutadiene	0.044	0.001
hexachlorocyclopentadiene	0.060	0.000
lindane	0.055	0.000
methoxychlor	0.050	0.000



Performance Data Sheet (con't)

pentachloophenol	0.096	0.001
simazine	0.120	0.004
Substance	**Influent Challenge Concentration mg/L**	**Maximum permissible product water concentration mg/L**
styrene	0.150	0.001
1,1,2,2-tetrachloroethane	0.081	0.001
tetrachloroethylene	0.081	0.001
toluene	0.078	0.001
2,4,5-TP (silvex)	0.270	0.002
tribromoacetic acid	0.042	0.001
1,2,4-trichlorobenzene	0.160	0.001
1,1,1-trichloroethane	0.084	0.005
1,1,2-trichloroethane	0.150	0.001
trichloroethylene	0.180	0.001
trihalomethanes (includes):		
chloroform (surrogate chemical)		
bromoform	0.300	0.015
bromodichloromethane		
chlorodibromomethane		
xylenes (total)	0.070	0.001



Performance Data Sheet (con't)

RO50* with AS3

These systems have been tested and certified by NSF International according to NSF/ANSI 53 and 58 for the reduction of the substances listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 53 and 58.

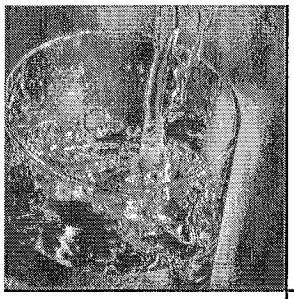
This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Arsenic (pentavalent)[2]	0.30 +/- 10%	0.01			99.3%
Barium	10.0 +/- 10%	2			98.5%
Cadmium	0.03 +/- 10%	0.005			98.1%
Hexavalent Chromium	0.30 +/- 10%	0.05			97.7%
Trivalent Chromium	0.30 +/- 10%	0.05			99.0%
Copper	3.00 +/- 10%	1.3			98.7%
Fluoride	8.0 +/- 10%	1.5			95.5%
Lead	0.15 +/- 10%	0.010			98.1%
Nitrate/Nitrite (both as N)	30 +/- 10%			65.9%	68.9%
Nitrate[5]	27.0 +/- 10%	10.0		66.2%	68.5%
Nitrite	3.0 +/- 10%	1.0		65.5%	69.8%
Radium 226/2283	25pCi/L +/- 10%	5pCi/L			80.0%
Selenium	0.10 +/- 10%	0.05			94.0%
Cyst[4]	>50,000/mL		99.95%	99.99%	99.99%
Turbidity	11 +/- 1 NTU	0.5 NTU			99.3%

1 While testing was performed under standard laboratory conditions, actual performance may vary depending on water pressure, temperatures and other substances, which may be found in your water.
2 This system has been tested for the treatment of water containing pentavalent arsenic (also known as As(V), As(+5) or arsenate) at concentrations of 0.30 mg/L or less. This system reduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual at the system inlet or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramines (combined chlorine) is not sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Facts Sheet for further information.
3 Based upon testing methods using Barium as a surrogate. All concentrations in pCi/L pico curie/L.
4 Includes Giardia lamblia, Entamoeba histolyca and Cryptosporidium.
5 Units are not certified on water supplies with a pressure less than 40 psi (280 kPa). A booster pump is strongly recommended.

*RO50 not for sale in California.



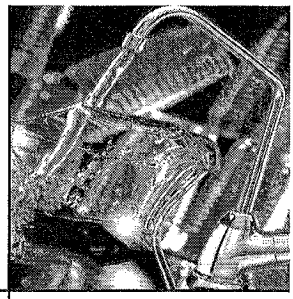
Performance Data Sheet (con't)

AS3

The AS3 has been tested according to NSF/ANSI 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 53. Conforms to NSF/ANSI Standard 53 for arsenic (trivalent and pentavalent) reduction. See Arsenic Fact section for an explanation of reduction performance.

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 53					
Trivalent Arsenic pH 6.5	0.050 + 10%	0.010			94.9%
Trivalent Arsenic pH 8.5	0.050 + 10%	0.010			98.0%
Pentavalent Arsenic	0.050 + 10%	0.010			97.4%

Flow Rate = 0.035 gpm (0.13 Lpm)
Capacity = 1000 gallons (3786 L)
1000 gallon capacity is only for use with PID
Testing was performed under standard laboratory conditions, actual performance may vary



Performance Data Sheet (con't)

RO50* with AS3, TD

These systems have been tested and certified by NSF International according to NSF/ANSI 42, 53 and 58 for the reduction of the substances listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42, 53 and 58.

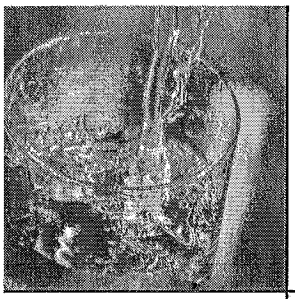
This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Con-centration mg/L	Reduction Require-ments	Minimum Reduction	Average Reduction
Arsenic (pentavalent)[2]	0.30 +/- 10%	0.01			99.3%
Barium	10.0 +/- 10%	2			98.5%
Cadmium	0.03 +/- 10%	0.005			98.1%
Hexavalent Chromium	0.30 +/- 10%	0.05			97.7%
Trivalent Chromium	0.30 +/- 10%	0.05			99.0%
Copper	3.00 +/- 10%	1.3			98.7%
Fluoride	8.0 +/- 10%	1.5			95.5%
Lead	0.15 +/- 10%	0.010			98.1%
Nitrate/Nitrite (both as N)	30 +/- 10%			65.9%	68.9%
Nitrate[5]	27.0 +/- 10%	10.0		66.2%	68.5%
Nitrite	3.0 +/- 10%	1.0		65.5%	69.8%
Radium 226/2283	25pCi/L +/- 10%	5pCi/L			80.0%
Selenium	0.10 +/- 10%	0.05			94.0%
Cyst[4]	>50,000/mL		99.95%	99.99%	99.99%
Turbidity	11 +/- 1 NTU	0.5 NTU			99.3%

1 While testing was performed under standard laboratory conditions, actual performance may vary depending on water pressure, temperatures and other substances, which may be found in your water.
2 This system has been tested for the treatment of water containing pentavalent arsenic (also known as As(V), As(+5) or arsenate) at concentrations of 0.30 mg/L or less. This system reduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual at the system inlet or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramines (combined chlorine) is not sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Facts Sheet for further information.
3 Based upon testing methods using Barium as a surrogate. All concentrations in pCi/L pico curie/L.
4 Includes Giardia lamblia, Entamoeba histolyca and Cryptosporidium.
5 Units are not certified on water supplies with a pressure less than 40 psi (280 kPa). A booster pump is strongly recommended.

*RO50 not for sale in California.



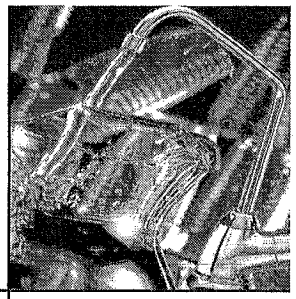
Performance Data Sheet (con't)

AS3

The AS3 has been tested according to NSF/ANSI 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 53. Conforms to NSF/ANSI Standard 53 for arsenic (trivalent and pentavalent) reduction. See Arsenic Fact section for an explanation of reduction performance.

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 53					
Trivalent Arsenic pH 6.5	0.050 + 10%	0.010			94.9%
Trivalent Arsenic pH 8.5	0.050 + 10%	0.010			98.0%
Pentavalent Arsenic	0.050 + 10%	0.010			97.4%

Flow Rate = 0.035 gpm (0.13 Lpm)
Capacity = 1000 gallons (3786 L)
1000 gallon capacity is only for use with PID
Testing was performed under standard laboratory conditions, actual performance may vary



Performance Data Sheet (con't)

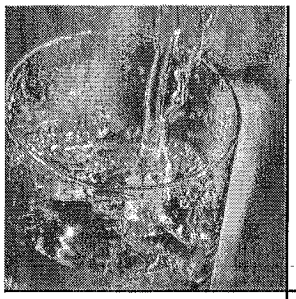
Total Defense (TD)

Total Defense has been tested according to NSF/ANSI 42 and 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42 and 53.

Substance Reduction[1]

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	97.6%	98.0%
Aesthetic Chloramines	3.0 mg/L + 10%	0.5 mg/L		97.6%	98.0%
Particulate (0.5 - < um) Class I	at least 10,000 particles/mL		>85%	99.9%	99.9%
Standard 53					
MTBE	0.015 + 20%	0.005 mg/L	69%	74.6%	83.3%
Cyst t	Minimum 50,000/L		99.95%	99.95%	99.99%
Turbidity	11 mg/L + 1 NTU	0.5 NTU		96.6%	98.0%
Lead (pH 6.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Lead (pH 8.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Mercury (pH 6.5)	0.006 mg/L + 10%	0.002 mg/L		96.6%	96.6%
Mercury (pH 8.5)	0.006 mg/L + 10%	0.002 mg/L		72.4%	95.4%
Chloroform (VOC surrogate chemical)	0.300 mg/L + 10%	0.015 mg/L		95.2%	91.0%

Flow Rate = 0.5 gpm (1.89 Lpm)
Capacity = 1,000 gallons (3786 L)
t Based on the use of microspheres or Cryptosporidium parvum oocysts
Testing was performed under standard laboratory conditions, actual performance may vary
Organic Chemicals Included in Surrogate Testing:
Applies to Total Defense (TD) only

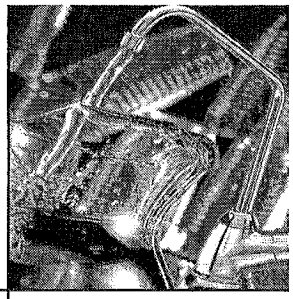


Performance Data Sheet (con't)

Organic Chemicals Included in Surrogate Testing:

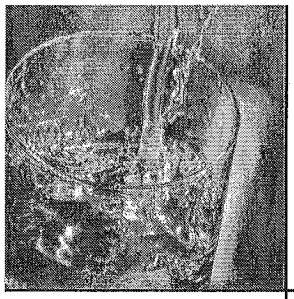
Applies to Total Defense (TD) only.

Substance	Influent Challenge Concentration mg/L	Maximum permissible product water concentration mg/L
alachor	0.050	0.001
atrazine	0.100	0.003
benzene	0.081	0.001
carbofuran	0.190	0.001
carbon tetrachloride	0.078	0.002
chlorbenzene	0.077	0.001
chlorpicrin	0.015	0.000
2,4-D	0.110	0.002
dibromochloropropane (DBCP)	0.052	0.000
o-dichlorobenzene	0.080	0.001
p-dichlorobenzene	0.040	0.001
1,2-dichloroethane	0.088	0.005
1,1-dichloroethylene	0.083	0.001
cis-1,2-dichloroethylene	0.170	0.001
trans-1,2-dichloroethylene	0.086	0.001
1,2-dichloropropane	0.080	0.001
cis-1,3dichloropropylene	0.079	0.001
dinoseb	0.170	0.000
endrin	0.053	0.001
ethylbenzene	0.088	0.001
ethylene dibromide (EDB)	0.044	0.000
haloacetonitriles (HAN):		
bromochloroacetonitrile	0.022	0.001
dibromoacetonitrile	0.024	0.001
dichloroacetonitrile	0.001	0.000
trichloracetonitrile	0.015	0.000
haloketones (HK):		
1,1-dichloro-2-propane	0.007	0.000
1,1,1-trichloro-2-propane	0.008	0.000
heptachlor	0.250	0.000
heptachlor epoxide	0.011	0.000
hexachlorobutadiene	0.044	0.001
hexachlorocyclopentadiene	0.060	0.000
lindane	0.055	0.000
methoxychlor	0.050	0.000
pentachloophenol	0.096	0.001



Performance Data Sheet (con't)

Substance	Influent Challenge Concentration mg/L	Maximum permissible product water concentration mg/L
simazine	0.120	0.004
styrene	0.150	0.001
1,1,2,2-tetrachloroethane	0.081	0.001
tetrachloroethylene	0.081	0.001
toluene	0.078	0.001
2,4,5-TP (silvex)	0.270	0.002
tribromoacetic acid	0.042	0.001
1,2,4-trichlorobenzene	0.160	0.001
1,1,1-trichloroethane	0.084	0.005
1,1,2-trichloroethane	0.150	0.001
trichloroethylene	0.180	0.001
trihalomethanes (includes):		
chloroform (surrogate chemical)		
bromoform	0.300	0.015
bromodichloromethane		
chlorodibromomethane		
xylenes (total)	0.070	0.001



Performance Data Sheet (con't)

Output (Total Dissolved Solids (TDS) Reduction and Output Production)[1] – RO30

Tank Size	2 gallon	3 gallon	9 gallon
Product System Daily Prod. Rate To Pressurized Storage Tank	11.09 gpd	11.09 gpd	11.09 gpd
Prod. Rate without Storage Tank To Atmosphere	36 gpd	36 gpd	36 gpd
Efficiency Rating[2]	16.86%	16.86%	16.86%
Recovery Rating[3]	28.84%	28.84%	28.84%
Influent Challenge Concentration (Mg/L)	770	770	770
Max. Permissible Product Water Concentration (Mg/L)	187	187	187
Minimum Percent Removal	93.1%	93.1%	93.1%
Average Percent Removal	95.4%	95.4%	95.4%

1 This is a factory specification for membrane production. Actual production rate and TDS rejection will depend on temperature, water pressure, TDS level, membrane variation and usage pattern.
2 Efficiency rating means the percentage of the influent water to the system that is available to the user are reverse osmosis treated water under operating conditions that approximate daily usage.
3 Recovery rating means the percentage of the influent water to the membrane portion of the system that is available to the user as reverse osmosis treated water when the system is operated without a storage tank or when the storage tank is bypassed.

Output (Total Dissolved Solids (TDS) Reduction and Output Production)[1] – RO50*

Tank Size	2 gallon	3 gallon	9 gallon
Product System Daily Prod. Rate To Pressurized Storage Tank	16.16 gpd	16.16 gpd	16.16 gpd
Prod. Rate without Storage Tank To Atmosphere	50 gpd	50 gpd	50 gpd
Efficiency Rating[2]	18.98%	18.98%	18.98%
Recovery Rating[3]	31.37%	31.37%	31.37%
Influent Challenge Concentration (Mg/L)	770	770	770
Max. Permissible Product Water Concentration (Mg/L)	187	187	187
Minimum Percent Removal	86.6%	86.6%	86.6%
Average Percent Removal	92.3%	92.3%	92.3%

1 This is a factory specification for membrane production. Actual production rate and TDS rejection will depend on temperature, water pressure, TDS level, membrane variation and usage pattern.
2 Efficiency rating means the percentage of the influent water to the system that is available to the user are reverse osmosis treated water under operating conditions that approximate daily usage.
3 Recovery rating means the percentage of the influent water to the membrane portion of the system that is available to the user as reverse osmosis treated water when the system is operated without a storage tank or when the storage tank is bypassed.

*RO50 not for sale in California.

Testing Conditions (Complete System)

Temperature: 77° F + 2° F

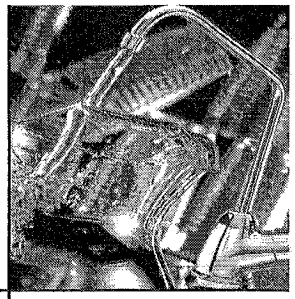
pH: 7.5 + 0.5

Pressure: 50 psi

Turbidity: <1 NTU

This system has been tested and shown to operate at its calculated recovery rating under standard laboratory conditions.

This reverse osmosis system contains a replaceable component critical to the efficiency of the system. Replacement of the reverse osmosis component should be with one of identical specifications, as defined by the manufacturer, to assure the same efficiency and contaminant reduction performance.



Performance Data Sheet (con't)

AS3

The AS3 has been tested according to NSF/ANSI 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 53. Conforms to NSF/ANSI Standard 53 for arsenic (trivalent and pentavalent) reduction. See Arsenic Fact section for an explanation of reduction performance.

Substance Reduction

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Concentration mg/L	Reduction Require-ments	Minimum Reduction	Average Reduction
Standard 53					
Trivalent Arsenic pH 6.5	0.050 + 10%	0.010			94.9%
Trivalent Arsenic pH 8.5	0.050 + 10%	0.010			98.0%
Pentavalent Arsenic	0.050 + 10%	0.010			97.4%

Flow Rate = 0.035 gpm (0.13 Lpm)
Capacity = 1000 gallons (3786 L)
1000 gallon capacity is only for use with PID
Testing was performed under standard laboratory conditions, actual performance may vary.

PER*

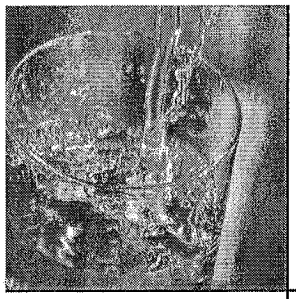
The PER has been tested for perchlorate reduction with an average influent of 103 ug/L and an average effluent of <1ug/L as tested by NSF International.

Substance Reduction

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Con-centration mg/L	Reduction Require-ments	Minimum Reduction	Average Reduction
Perchlorate	0.10 + 10%	0.006			99.0%

Flow Rate = 0.035 gpm (0.13 Lpm)
Capacity = 1000 gallons (3786 L)
Testing was performed under standard laboratory conditions, actual performance may vary.

* Cartridge not for sale in California.



Performance Data Sheet (con't)

The Aqua-Cleer Advanced Drinking Water System with CB, GAC, or GAC-L cartridge has been tested and certified by NSF International against NSF/ANSI Standard 42 for the effective reduction of aesthetic Chlorine Taste and Odor, the TD cartridge for the effective reduction of aesthetic Chlorine Taste and Odor and Nominal Particulate Class 1 and against CSA B483.1.

NSF C US

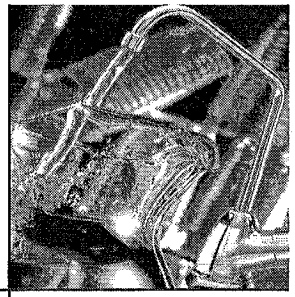
The Aqua-Cleer Advanced Drinking Water System with TD cartridge has been tested and certified by NSF International against NSF/ANSI Standard 53 for the effective reduction of Cyst, Lead, Mercury, VOC, MTBE and Turbidity and against CSA B483.1.

The Aqua-Cleer Advanced Drinking Water System with RO30 or RO50* has been tested and certified by NSF International against NSF/ANSI Standard 58 for the effective reduction of TDS, pentavalent arsenic, barium, cadmium, hexavalent and trivalent chromium, copper, lead, nitrate/nitrite, radium 226/228 and selenium. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system as specified in NSF/ANSI 58 and against CSA B483.1.

The Aqua-Cleer Advanced Drinking Water System with AS3 has been tested and certified by NSF International against NSF/ANSI Standard 53 for the effective reduction of arsenic (trivalent and pentavalent) when following an RO and against CSA B483.1.

Refer to your Installation and Operating Instructions and printed limited Warranties for more specific product information. To avoid contamination from improper handling and installation, your system should only be installed and serviced by your Culligan Man. Performance will vary based on local water conditions. The substances reduced by these systems are not necessarily in your water.

*RO50 not for sale in California.



State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1956

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Tank Capacity
Culligan International Company Aqua-Cleer Advanced Drinking Water System with TD	TD- 01020274	2 gallons

Manufacturer: Culligan International Company

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Inorganic/Radiological Contaminants

Lead
Mercury

Organic Contaminants

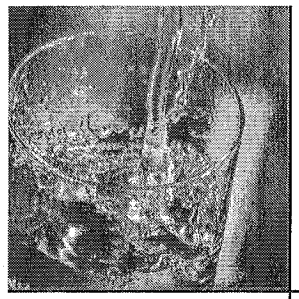
MTBE
VOCs

Alachlor	Atrazine	Benzene
Bromodichloromethane	Bromoform	Carbofuran
Carbon Tetrachloride	Chlorobenzene	Chloroform
2,4-D	DBCP	Dibromodichloromethane
o-Dichlorobenzene	p-Dichlorobenzene	1,1-Dichloroethane
1,2-Dichloroethane	trans-1,2-Dichloroethylene	1,1-Dichloroethylene
cis-1,2-Dichloroethylene	1,2-Dichloropropane	cis-1,3-Dichloropropylene
Dinoseb	EDB	Endrin
Ethylbenzene	Heptachlor	Heptachlor Epoxide
Hexachlorocyclopentadiene	Hexachlorobutadiene	Lindane
Methoxychlor	Pentachlorophenol	Simazine
Styrene	2,4,5-TP (Silvex)	Tetrachloroethylene
1,1,2,2-Tetrachloroethane	Toluene	1,2,4-Trichlorobenzene
1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethylene
m-Xylene	o-Xylene	p-Xylene

[1]Trihalomethanes

Rated Service Capacity: 1000 gal **Rated Service Flow:** 0.5 gpm

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.



California Certificates

State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1947

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Tank Capacity
Culligan International Company Aqua-Cleer Advanced Drinking Water System with TD	TD- 01020274	3 gallons

Manufacturer: Culligan

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Inorganic/Radiological Contaminants

Lead
Mercury

Organic Contaminants

MTBE
VOCs

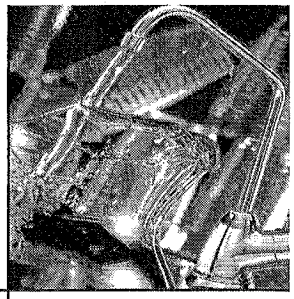
Alachlor
Bromodichloromethane[1]
Carbon Tetrachloride
2,4-D
o-Dichlorobenzene
1,2-Dichloroethane
cis-1,2-Dichloroethylene
Dinoseb
Ethylbenzene
Hexachlorocyclopentadiene
Methoxychlor
Styrene
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
m-Xylene
[1]Trihalomethanes

Atrazine
Bromoform[1]
Chlorobenzene
DBCP
p-Dichlorobenzene
trans-1,2-Dichloroethylene
1,2-Dichloropropane
EDB
Heptachlor
Hexachlorobutadiene
Pentachlorophenol
2,4,5-TP (Silvex)
Toluene
1,1,2-Trichloroethane
o-Xylene

Benzene
Carbofuran
Chloroform[1]
Dibromodichloromethane[1]
1,1-Dichloroethane
1,1-Dichloroethylene
cis-1,3-Dichloropropylene
Endrin
Heptachlor Epoxide
Lindane
Simazine
Tetrachloroethylene
1,2,4-Trichlorobenzene
Trichloroethylene
p-Xylene

Rated Service Capacity: 1000 gal **Rated Service Flow:** 0.5 gpm

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.



State of California
Department of Public Health

Water Treatment Device Certificate Number 10 - 1957

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Tank Capacity
Culligan International Company Aqua-Cleer Advanced Drinking Water System with TD	TD- 01020274	9 gallons

Manufacturer: Culligan International Company

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Inorganic/Radiological Contaminants

Lead
Mercury

Organic Contaminants

MTBE
VOCs

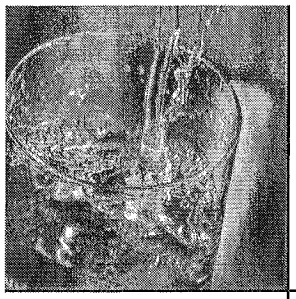
Alachlor
Bromodichloromethane[1]
Carbon Tetrachloride
2,4-D
o-Dichlorobenzene
1,2-Dichloroethane
cis-1,2-Dichloroethylene
Dinoseb
Ethylbenzene
Hexachlorocyclopentadiene
Methoxychlor
Styrene
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
m-Xylene
[1]Trihalomethanes

Atrazine
Bromoform
Chlorobenzene
DBCP
p-Dichlorobenzene
trans-1,2-Dichloroethylene
1,2-Dichloropropane
EDB
Heptachlor
Hexachlorobutadiene
Pentachlorophenol
2,4,5-TP (Silvex)
Toluene
1,1,2-Trichloroethane
o-Xylene

Benzene
Carbofuran
Chloroform[1]
Dibromodichloromethane[1]
1,1-Dichloroethane
1,1-Dichloroethylene
cis-1,3-Dichloropropylene
Endrin
Heptachlor Epoxide
Lindane
Simazine
Tetrachloroethylene
1,2,4-Trichlorobenzene
Trichloroethylene
p-Xylene

Rated Service Capacity: 1000 gal **Rated Service Flow:** 0.5 gpm

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.



California Certificates

State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1954

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Rated Service Flow
Culligan International Company Aqua-Cleer Advanced Drinking Water System with RO30	RO-30 01020268 - RO Membrane	11.09 gpd

Manufacturer: Culligan International Company **Tank Capacity:** 2 gallons

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Inorganic/Radiological Contaminants

Arsenic (pentavalent) 50 ppb[1]
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Nitrate/Nitrite[2]
Radium 226/228
Selenium

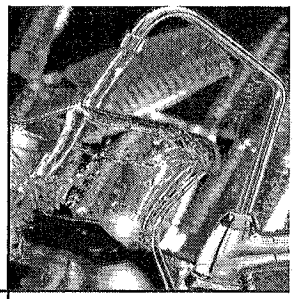
Organic Contaminants

None

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2] This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the performance of this system. Frequent analysis is encouraged.



State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1928

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Rated Service Flow
Culligan International CompanyAqua-Cleer Advanced Drinking Water System with RO30	RO-30 01020268 - RO Membrane	11.09 gpd

Manufacturer: Culligan **Tank Capacity:** 3 gallons

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Inorganic/Radiological Contaminants

Arsenic (pentavalent) 50 ppb
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Nitrate/Nitrite[2]
Radium 226/228
Selenium

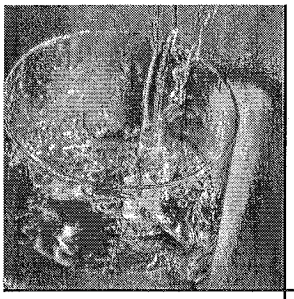
Organic Contaminants

None

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2] This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the performance of this system. Frequent analysis is encouraged.



California Certificates

State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1955

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Rated Service Flow
Culligan International Company Aqua-Cleer Advanced Drinking Water System with RO30	RO-30 01020268 - RO Membrane	11.09 gpd

Manufacturer: Culligan International Company **Tank Capacity:** 9 gallons

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Organic Contaminants

None

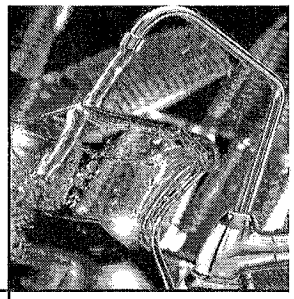
Inorganic/Radiological Contaminants

Arsenic[1] (pentavalent) 50 ppb
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Nitrate/Nitrite[2]
Radium 226/228
Selenium

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2]This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the performance of this system. Frequent analysis is encouraged.



State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1958

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Tank Capacity
Culligan International Company Aqua-Cleer Advanced Drinking Water System with RO30 and TD	RO-30 01020268 - RO Membrane TD-01020274 - Post Filter	2 gallons

Manufacturer: Culligan International Company

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Inorganic/Radiological Contaminants

Arsenic[1] (pentavalent) 50 ppb
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Mercury
Nitrate/Nitrite[2]
Radium 226/228
Selenium

Organic Contaminants

MTBE
VOCs

Alachlor
Bromodichloromethane
Carbon Tetrachloride
2,4-D
o-Dichlorobenzene
1,2-Dichloroethane
cis-1,2-Dichloroethylene
Dinoseb
Ethylbenzene
Hexachlorocyclopentadiene
Methoxychlor
Styrene
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
m-Xylene
[1]Trihalomethanes

Atrazine
Bromoform[1]
Chlorobenzene
DBCP
p-Dichlorobenzene
trans-1,2-Dichloroethylene
1,2-Dichloropropane
EDB
Heptachlor
Hexachlorobutadiene
Pentachlorophenol
2,4,5-TP (Silvex)
Toluene
1,1,2-Trichloroethane
o-Xylene

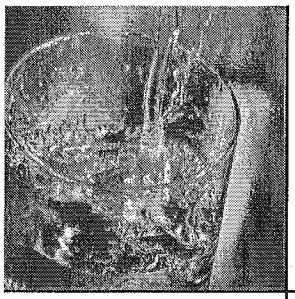
Benzene
Carbofuran
Chloroform[1]
Dibromodichloromethane[1]
1,1-Dichloroethane
1,1-Dichloroethylene
cis-1,3-Dichloropropylene
Endrin
Heptachlor Epoxide
Lindane
Simazine
Tetrachloroethylene
1,2,4-Trichlorobenzene
Trichloroethylene
p-Xylene

Rated Service Capacity: 1000 gal **Rated Service Flow:** 0.5 gpm

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2]This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the



California Certificates

State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1944

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Tank Capacity
Culligan International Company Aqua-Cleer Advanced Drinking Water System with RO30 and TD	RO-30 01020268 - RO Membrane TD-01020274 - Post Filter	3 gallons

Manufacturer: Culligan

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Inorganic/Radiological Contaminants

Arsenic[1] (pentavalent) 50 ppb
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Mercury
Nitrate/Nitrite[2]
Radium 226/228
Selenium

Organic Contaminants

MTBE
VOCs

Alachlor
Bromodichloromethane
Carbon Tetrachloride
2,4-D
o-Dichlorobenzene
1,2-Dichloroethane
cis-1,2-Dichloroethylene
Dinoseb
Ethylbenzene
Hexachlorocyclopentadiene
Methoxychlor
Styrene
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
m-Xylene
[1]Trihalomethanes

Atrazine
Bromoform[1]
Chlorobenzene
DBCP
p-Dichlorobenzene
trans-1,2-Dichloroethylene
1,2-Dichloropropane
EDB
Heptachlor
Hexachlorobutadiene
Pentachlorophenol
2,4,5-TP (Silvex)
Toluene
1,1,2-Trichloroethane
o-Xylene

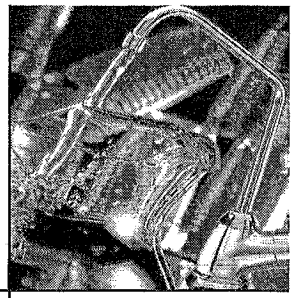
Benzene
Carbofuran
Chloroform[1]
Dibromodichloromethane[1]
1,1-Dichloroethane
1,1-Dichloroethylene
cis-1,3-Dichloropropylene
Endrin
Heptachlor Epoxide
Lindane
Simazine
Tetrachloroethylene
1,2,4-Trichlorobenzene
Trichloroethylene
p-Xylene

Rated Service Capacity: 1000 gals **Rated Service Flow:** 0.5 gpm

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2]This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the



State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1959

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Tank Capacity
Culligan International Company Aqua-Cleer Advanced Drinking Water System with RO30 and TD	RO-30 01020268 - RO Membrane TD-01020274 - Post Filter	9 gallons

Manufacturer: Culligan International Company

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Inorganic/Radiological Contaminants

Arsenic[1] (pentavalent)/50 ppb
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Mercury
Nitrate/Nitrite[2]
Radium 226/228
Selenium

Organic Contaminants

MTBE
VOCs

Alachlor
Bromodichloromethane
Carbon Tetrachloride
2,4-D
o-Dichlorobenzene
1,2-Dichloroethane
cis-1,2-Dichloroethylene
Dinoseb
Ethylbenzene
Hexachlorocyclopentadiene
Methoxychlor
Styrene
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
m-Xylene
[1]Trihalomethanes

Atrazine
Bromoform[1]
Chlorobenzene
DBCP
p-Dichlorobenzene
trans-1,2-Dichloroethylene
1,2-Dichloropropane
EDB
Heptachlor
Hexachlorobutadiene
Pentachlorophenol
2,4,5-TP (Silvex)
Toluene
1,1,2-Trichloroethane
o-Xylene

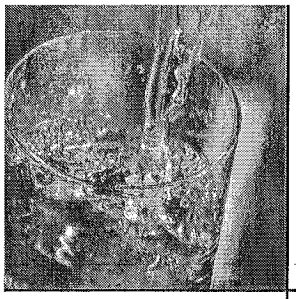
Benzene
Carbofuran
Chloroform[1]
Dibromodichloromethane[1]
1,1-Dichloroethane
1,1-Dichloroethylene
cis-1,3-Dichloropropylene
Endrin
Heptachlor Epoxide
Lindane
Simazine
Tetrachloroethylene
1,2,4-Trichlorobenzene
Trichloroethylene
p-Xylene

Rated Service Capacity: 1000 gal **Rated Service Flow:** 0.5 gpm

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2]This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the



California Certificates

State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1960

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Rated Service Flow
Culligan International Company Aqua-Cleer Advanced Drinking Water System with RO30 and AS3	RO-30 61020268 - RO Membrane AS3 - P1020272 - Post Filter	0.035 gpm **Rated Service Capacity** 1000 gal

Manufacturer: Culligan International Company **Tank Capacity:** 2 gallons

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Organic Contaminants

None

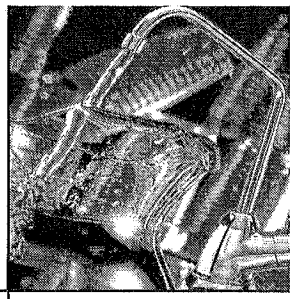
Inorganic/Radiological Contaminants

Arsenic (pentavalent) 50 ppb
Arsenic (trivalent) 50 ppb
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Nitrate/Nitrite[2]
Radium 226/228
Selenium

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2]This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the performance of this system. Frequent analysis is encouraged.



State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1948

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Rated Service Flow
Culligan International Company Aqua Cleer Advanced Drinking Water System with RO30 and AS3	RO-30 01020268 - RO Membrane AS3 - P1020272 - Post Filter	0.035 gpm **Rated Service Capacity** 1000 gal

Manufacturer: Culligan International Company **Tank Capacity:** 3 gallons

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Organic Contaminants

None

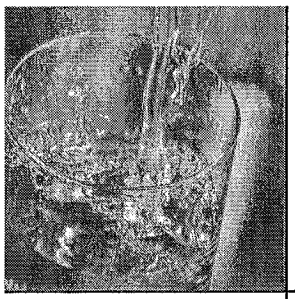
Inorganic/Radiological Contaminants

Arsenic (pentavalent) 50 ppb[1]
Arsenic (trivalent) 50 ppb[1]
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Nitrate/Nitrite[2]
Radium 226/228
Selenium

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2] This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the performance of this system. Frequent analysis is encouraged.



California Certificates

State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1961

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Rated Service Flow
Culligan International Company Aqua-Cleer Advanced Drinking Water System with RO30 and AS3	RO-30 0102026S - RO Membrane AS3 - P1020272 - Post Filter	0.035 gpm **Rated Service Capacity** 1000 gal

Manufacturer: Culligan International Company **Tank Capacity:** 9 gallons

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Organic Contaminants

None

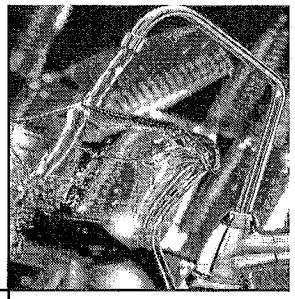
Inorganic/Radiological Contaminants

Arsenic (pentavalent) 50 ppb
Arsenic (trivalent) 50 ppb
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Nitrate/Nitrite
Radium 226/228
Selenium

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2]This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the performance of this system. Frequent analysis is encouraged.



State of California
Department of Public Health

Water Treatment Device Certificate Number 10 - 1962

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Tank Capacity
Culligan International Company Aqua-Cleer Advanced Drinking Water System with RO30, TD and AS3	RO-30 01020268 - RO Membrane TD - 01020274 - Post Filter AS3 - P1020272 - Post Filter	2 gallons

Manufacturer: Culligan International Company

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Inorganic/Radiological Contaminants

Arsenic[1] (pentavalent) 50 ppb
Arsenic[1] (trivalent) 50 ppb
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Nitrate/Nitrite[2]
Radium 226/228
Selenium

Organic Contaminants

MTBE
VOCs

Alachlor
Bromodichloromethane[1]
Carbon Tetrachloride
2,4-D
o-Dichlorobenzene
1,2-Dichloroethane
cis-1,2-Dichloroethylene
Dinoseb
Ethylbenzene
Hexachlorocyclopentadiene
Methoxychlor
Styrene
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
m-Xylene
[1]Trihalomethanes

Atrazine
Bromoform
Chlorobenzene
DBCP
p-Dichlorobenzene
trans-1,2-Dichloroethylene
1,2-Dichloropropane
EDB
Heptachlor
Hexachlorobutadiene
Pentachlorophenol
2,4,5-TP (Silvex)
Toluene
1,1,2-Trichloroethane
o-Xylene

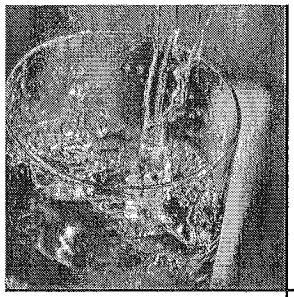
Benzene
Carbofuran
Chloroform[1]
Dibromodichloromethane[1]
1,1-Dichloroethane
1,1-Dichloroethylene
cis-1,3-Dichloropropylene
Endrin
Heptachlor Epoxide
Lindane
Simazine
Tetrachloroethylene
1,2,4-Trichlorobenzene
Trichloroethylene
p-Xylene

Rated Service Capacity: 1000 gal **Rated Service Flow:** 0.035 gpm

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2]This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the



California Certificates

State of California
Department of Public Health

Water Treatment Device Certificate Number

10 - 1949

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Tank Capacity
Culligan International Company Aqua Cleer Advanced Drinking Water System with RO30, TD and AS3	RO-30 01020268 - RO Membrane TD - 01020274 - Post Filter AS3 - P1020272 - Post Filter	3 gallons

Manufacturer: Culligan International Company

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Organic Contaminants

MTBE
VOCs

Alachlor
Bromodichloromethane[1]
Carbon Tetrachloride
2,4-D
o-Dichlorobenzene
1,2-Dichloroethane
cis-1,2-Dichloroethylene
Dinoseb
Ethylbenzene
Hexachlorocyclopentadiene
Methoxychlor
Styrene
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
m-Xylene

Atrazine
Bromoform[1]
Chlorobenzene
DBCP
p-Dichlorobenzene
trans-1,2-Dichloroethylene
1,2-Dichloropropane
EDB
Heptachlor
Hexachlorobutadiene
Pentachlorophenol
2,4,5-TP (Silvex)
Toluene
1,1,2-Trichloroethane
o-Xylene

Benzene
Carbofuran
Chloroform[1]
Dibromodichloromethane[1]
1,1-Dichloroethane
1,1-Dichloroethylene
cis-1,3-Dichloropropylene
Endrin
Heptachlor Epoxide
Lindane
Simazine
Tetrachloroethylene
1,2,4-Trichlorobenzene
Trichloroethylene
p-Xylene

[1]Trihalomethanes

Inorganic/Radiological Contaminants

Arsenic[1] (pentavalent) 50 ppb
Arsenic (trivalent) 50 ppb
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Nitrate/Nitrite[2]
Radium 226/228
Selenium

Rated Service Capacity: 1000 gal **Rated Service Flow:** 0.035 gpm

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2]This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater. A sampling and analysis test kit for nitrate is provided for checking the

California Certificates

State of California
Department of Public Health

Water Treatment Device Certificate Number 10 - 1963

Date Issued: July 16, 2010

Trademark/Model Designation	Replacement Elements	Tank Capacity
Culligan International Company Aqua-Cleer Advanced Drinking Water System with RO30, TD and AS3	RO-30 01020268 - RO Membrane TD - 01020274 - Post Filter AS3 - P1020272 - Post Filter	9 gallons

Manufacturer: Culligan International Company

The water treatment device(s) listed on this certificate have met the testing requirements pursuant to Section 116830 of the Health and Safety Code for the following health related contaminants:

Microbiological Contaminants and Turbidity

Cysts (protozoan)
Turbidity

Inorganic/Radiological Contaminants

Arsenic[1] (pentavalent) 50 ppb
Arsenic[1] (trivalent) 50 ppb
Barium
Cadmium
Chromium (hexavalent)
Chromium (trivalent)
Copper
Fluoride
Lead
Nitrate/Nitrite
Radium 226/228
Selenium

Organic Contaminants

MTBE
VOCs

Alachlor
Bromodichloromethane
Carbon Tetrachloride
2,4-D
o-Dichlorobenzene
1,2-Dichloroethane
cis-1,2-Dichloroethylene
Dinoseb
Ethylbenzene
Hexachlorocyclopentadiene
Methoxychlor
Styrene
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
m-Xylene
[1]Trihalomethanes

Atrazine
Bromoform[1]
Chlorobenzene
DBCP
p-Dichlorobenzene
trans-1,2-Dichloroethylene
1,2-Dichloropropane
EDB
Heptachlor
Hexachlorobutadiene
Pentachlorophenol
2,4,5-TP (Silvex)
Toluene
1,1,2-Trichloroethane
o-Xylene

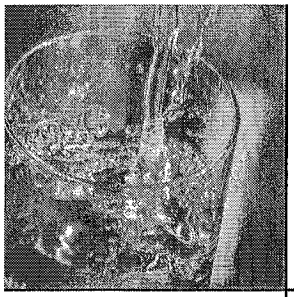
Benzene
Carbofuran
Chloroform
Dibromodichloromethane[1]
1,1-Dichloroethane
1,1-Dichloroethylene
cis-1,3-Dichloropropylene
Endrin
Heptachlor Epoxide
Lindane
Simazine
Tetrachloroethylene
1,2,4-Trichlorobenzene
Trichloroethylene
p-Xylene

Rated Service Capacity: 1000 gal **Rated Service Flow:** 0.035 gpm

Do not use where water is microbiologically unsafe or with water of unknown quality, except that systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

[1] Claims for arsenic reduction shall only be made on water supplies maintaining detectable residual free chlorine at the reverse osmosis (RO) system inlet. Water systems using an in-line chlorinator should provide a minimum of 1 minute chlorine contact time before the RO system.

[2]This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L



Arsenic Fact Sheet

Arsenic (abbreviated As) is found naturally in some well water. Arsenic in water has no color, taste or odor. It must be measured by a lab test. Public water utilities must have their water tested for arsenic. You can get the results from your water utility. If you have your own well, you can have the water tested. The local health department or the state environmental health agency can provide a list of certified labs. The cost is typically $15 - $30. Information about arsenic in water can be found on the internet at the US Environmental Protection Agency website:
www.epa.gov/safe water/arsenic.html.

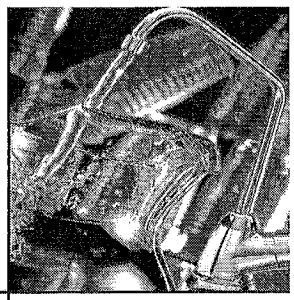
There are two forms of arsenic: pentavalent arsenic (also called As (v), As (+5), and arsenate) and trivalent arsenic (also called As (III), As (+3), and arsenite). In well water, arsenic may be pentavalent, trivalent, or a combination of both. Special sampling procedures are needed for a lab to determine what type and how much of each type of arsenic is in the water. Check with the labs in your area to see if they can provide this type of service.

Reverse osmosis (RO) water treatment systems do not remove trivalent arsenic from water very well. RO systems are very effective at removing pentavalent arsenic. A free chlorine residual will rapidly convert trivalent arsenic to pentavalent arsenic. Other water treatment chemicals such as ozone and potassium permanganate will also change trivalent arsenic to pentavalent arsenic. A combined chlorine residual (also called chloramine) may not convert all the trivalent arsenic. If you get water from a public water utility, contact the utility to find out if free chlorine or combined chlorine is used in the water system.

The Aqua-Cleer system is designed to remove pentavalent arsenic. It will not convert trivalent arsenic to pentavalent arsenic. The system was tested in a lab. Under those conditions, the system reduced 0.050 mg/L (ppm) pentavalent arsenic to 0.010 mg/L (ppm) (the USEPA standard for drinking water) or less. The performance of the system may be different at your installation. Have the treated water tested for arsenic to check if the system is working properly.

The RO component of the Aqua-Cleer system must be replaced every 3-5 years to ensure the system will continue to remove pentavalent arsenic. The component identification and locations where you can purchase the component are listed in the installation/operation manual.

The system has been tested for the treatment of water containing pentavalent arsenic (also known as As (V), As (III), or arsenate) at concentrations of 0.050 mg/L or less. This system reduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramine (combined chlorine) is not sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Fact section of the Performance data Sheet for further information.



Arsenic Fact Sheet (con't)

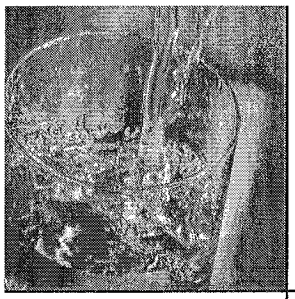
Arsenic (As) is a naturally occurring contaminant found in many ground waters. It generally occurs in two forms (valences or oxidation states): pentavalent arsenic (also known as As(V), As(+5), and arsenate) and trivalent arsenic (also known as As(III), As(+3), and arsenite). In natural ground water, arsenic may exist as trivalent arsenic, pentavalent arsenic, or a combination of both. More information about arsenic and its toxicity can be found at the Agency for Toxic Substances and Disease Registry Toxicological Profile on Arsenic website at http://www.atsdr.cdc.gov/toxprofiles/phs2.html, and at the U.S. Environmental Protection Agency website at http://www.epa.gov/safewater/arsenic.html.

Arsenic does not generally impart color, taste, or smell to water; therefore, it can only be detected by a chemical analytical test. Public water supplies are required to monitor delivered water for arsenic (trivalent arsenic plus pentavalent arsenic) and the results are available to the public from the utility. Consumers using private water sources will need to make arrangements for testing. An arsenic test usually costs about $15-30, and it is recommended that the test be conducted by a certified laboratory. Local health departments or environmental protection agencies can help provide consumers with a list of certified laboratories. Some laboratories may also be able to analyze specifically for (speciate) the form(s) of arsenic present in a water sample if requested.

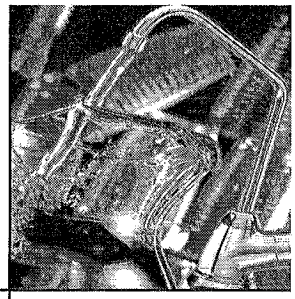
The Aqua-Cleer system with AS3 following an RO is designed to reduce arsenic: both pentavalent and trivalent forms of arsenic. This treatment system was tested under laboratory condition as defined in NSF/ANSI 53 Drinking Water Treatment Units - Health Effects and was found to reduce [influent arsenic challenge concentration 0.050 mg/L] arsenic consisting of either pentavalent or trivalent arsenic in the test water to less than 0.010 mg/L, for [tested treatment capacity] gallons of delivered water, the life of the system under standard testing conditions. Actual performance of the system may vary depending on specific water quality conditions at the consumer's installation. Following installation of this system, the consumer should have the treated water tested for arsenic to verify that arsenic reduction is being achieved and the system is functioning properly.

The arsenic removal component of this system must be replace at the end of its useful life of 1,000 gallons. The replacement components, AS3, RO30, RO50* can be purchased from your local Culligan dealer.

*RO50 not for sale in California.



Troubleshooting Guide



Troubleshooting Guide (con't)

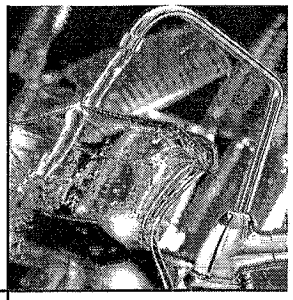
Service Log

Model_____ Serial No._____

Date Installed _____

For Service Call Culligan at: (_____) _____ - _____

Cartridge(s) Changed						
Date Serviced	Sediment Filter	Activated Pre-Carbon Filter	RO Membrane	Activated Post-Carbon Filter	Sanitized	Specialty Cartridge



Culligan Lifetime Limited Warranty

Culligan Aqua-Cleer Advanced Drinking Water System

You have just purchased one of the finest drinking water systems made. As an expression of our confidence in Culligan products, your drinking water system is warranted to the original end-user, when installed in accordance with Culligan International Company specifications, against defects in material and workmanship from the date of original installation, as follows:

• **For the LIFETIME of the original end-user**	**The entire reverse osmosis water conditioning unit, EXCLUDING THE EXPENDABLE FILTER CARTRIDGES AND REVERSE OSMOSIS MEMBRANE FILTER USED IN THE UNIT.**
• **For a period of ONE YEAR**	**The Culligan brand reverse osmosis membrane filter.**

If a part described above is found defective within the specified period, you should notify your independently operated Culligan dealer and arrange a time during normal business hours for the dealer to inspect the drinking water system on your premises. Any part found defective within the terms of this warranty will be repaired or replaced by the dealer. You pay only freight from our factory and local dealer charges.

Damage caused by accident, fire, flood, freezing, Act of God, misuse, misapplication, neglect, alteration, installation or operation contrary to our printed instructions, or by the use of accessories or components which do not meet Culligan specifications, is not covered by this warranty.

Our product performance specifications are furnished with each drinking water system. TO THE EXTENT PERMITTED BY LAW, CULLIGAN DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE; TO THE EXTENT REQUIRED BY LAW, ANY SUCH IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE ONE-YEAR PERIOD SPECIFIED ABOVE FOR THE PARTS DESCRIBED IN THIS LIMITED WARRANTY. As manufacturer, we do not know the characteristics of your water supply or the purpose for which you are purchasing a drinking water system. Please understand that the quality of water supplies may vary seasonally or over a period of time, and that your water usage rate may vary as well. Water characteristics can also change considerably if your drinking water system is moved to a new location. For these reasons, we assume no liability for the determination of the proper equipment necessary to meet your requirements, and we do not authorize others to assume such obligations for us. Further, we assume no liability and extend no warranties, express or implied, for the use of this product on a non-potable water source. OUR OBLIGATIONS UNDER THIS WARRANTY ARE LIMITED TO THE REPAIR OR REPLACEMENT OF THE FAILED PARTS OF THE DRINKING WATER SYSTEM, AND WE ASSUME NO LIABILITY WHATSOEVER FOR DIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, GENERAL, OR OTHER DAMAGES, WHETHER FROM CORROSION OR OTHER CAUSES.

CONSUMERS:
Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Similarly, some states do not allow the exclusion of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Consult your telephone directory for your local independently-operated Culligan dealer, or write Culligan International Company, for warranty and service information.

Culligan International Company
9399 W. Higgins Road, Suite 1100
Rosemont, Illinois 60018

Attachment E

Long-Term Monitoring Plan for Private Wells without POETs

Long-Term Monitoring Plan for Private Wells without POETs

Corrective Action Areas I and II – Operable Unit B
Attachment E

Prepared for
Saint-Gobain Performance Plastics

March 2020

E1.0 Introduction

This Plan for performing Long-Term Monitoring (LTM Plan) of private wells without point-of-entry treatment (POET) systems, prepared by Barr Engineering Co. (Barr) on behalf of Saint-Gobain Performance Plastics (Saint-Gobain), complies with the Consent Order and Final Judgement, dated May 28, 2019 (Consent Order). This Consent Order supersedes the Consent Order and Final Judgement, dated October 2, 2017. Specifically, this plan addresses Appendix A, Section IV Corrective Action Area II – Operable Unit B, paragraph 8f, of the Consent Order, which requires a long-term monitoring plan for private wells in Corrective Action Areas Operable Unit B (CAAs OUB) without POET systems.

Monitoring of private wells within CAAs OUB with concentrations of per- and poly-fluoroalkyl substances (PFAS) less than the regulatory standard will be performed under this LTM Plan. Based on the sampling conducted as of the effective date of the Consent Order, 144 private wells with PFAS concentrations below the regulatory standard have been identified in CAAs OUB. In addition, there are currently 24 wells within Operable Unit A that will continue to be monitored in accordance with this Plan until the residence has been connected to municipal water. The current regulatory standard established by the Groundwater Protection Rule and Strategy is 20 parts per trillion (ppt) for the combined concentrations (sum of): perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), and perfluorononanoic acid (PFNA). Private wells within CAAs OUB with PFAS concentrations at or above the regulatory standard have received POET or POU systems and are monitored in accordance with the POET Systems Operation & Maintenance Plan (POET OM&M Manual; Attachment D).

E2.0 Sampling Plan

The purpose of this LTM Plan is to establish a process for monitoring private wells in CAAs OUB that are not covered under the POET OM&M Manual because they either do not contain PFAS, or contain PFAS concentrations less than the regulatory standard. This LTM Plan applies to all wells without POETs, including:

- Existing wells in CAAs OUB that had not been tested as of the effective date of the Consent Order, but have subsequently been tested by Vermont Department of Environmental Conservation (VTDEC);
- New wells in CAAs OUB that are drilled after the effective date of the Consent Order; and
- Wells that had POET systems in CAAs OUB as of the effective date of the Consent Order, but the POETs have either been removed or are no longer required because the concentration of PFAS meets the regulatory standards.

Samples will be analyzed using a modified version identified in EPA Method 537.1 and will include the following 18 analytes:

Analyte	Acronym	Chemical Abstract Services Registry Number (CASRN)
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluorononanoic acid	PFNA	375-95-1
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorotetradecanoic acid	PFTA	376-06-7
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluoroundecanoic acid	PFUnA	2058-94-8
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4

Water samples will be collected from the private wells to which the LTM Plan applies on a semi-annual (twice a year) basis, contingent on gaining access to the wells, until a new sampling frequency is supported based on the sampling results of these wells over time and the Secretary of the Agency of Natural Resources (ANR) concurs with a recommended change in this sampling frequency. Currently, the LTM Plan covers 144 private wells in CAAs OUB, which are listed in Table E1 and shown on Figure E1.

If the PFAS concentration is at or above the regulatory standard in a private well monitored under this LTM Plan, Saint-Gobain will as soon as practicable notify the State and provide bottled water to the well owner, in accordance with the Bottled Water Plan (Attachment C). Within 30 days of receipt of the laboratory results, the reasonableness and cost effectiveness of connecting the subject property to the municipal water system, installing a POET system, or replacing the well (Plan for Private Well Replacement at Locations with POETs; Attachment A) will be evaluated. Prior to this evaluation, the property owner may request an additional water sample to confirm the PFAS concentration is at or above the regulatory standard. If the result of the confirmation sample is also at or above the regulatory standard, the need for further actions will be made in consultation with VTDEC.

E2.1 Sample Collection Procedures

The sampling activities conducted under this LTM Plan will be performed in accordance with the following supporting documents:

- Field Sampling Plan (FSP), dated June 2019, which presents the standard field sampling and data gathering procedures to be followed during implementation of the field activities.
- Quality Assurance Project Plan (QAPP), dated July 2019, which provides project-specific organization details, objectives, data acquisition, data assessment, oversight, data review procedures, and analytical parameters. Protocols for sample collection, handling, storage, chain-of-custody, laboratory and/or field analyses, data evaluation and validation, and reporting are also addressed.
- Project-Specific Health and Safety Plan (PHASP), dated December 2018, which addresses the potential health and safety hazards that may be encountered while performing the work.

E2.2 Groundwater Performance Standards

Private wells will continue to be monitored at a schedule agreed to by VTDEC and Saint-Gobain, and will remain in place until the performance standards as set forth in the Consent Order, Appendix A, paragraphs 8e and 8h are met.

If as part of the Consent Order, a private water well is being replaced with a new well or eliminated if the location is being connected to municipal water, the private water well will be properly closed in accordance with ANR, Chapter 21, Water Supply Rule or converted into a long-term monitoring well.

E3.0 Schedule

Sampling in accordance with this LTM Plan will be completed on a semi-annual (twice a year) basis, contingent on gaining access to the private wells. Laboratory analytical results for each private well sampling event will be forwarded to VTDEC in accordance with the reporting schedule defined by the Consent Order.

E4.0 Reporting

For water samples with PFAS concentrations below the regulatory standard, the laboratory report of the analytical results will be provided to VTDEC on the schedule specified by the Consent Order and the private well will continue to be monitored at the sampling frequency of the LTM Plan.

For water samples with PFAS concentrations at or above the regulatory standard, VTDEC will be notified as soon as practicable and provided a copy of the laboratory report of the analytical results. The need for further actions will be made in consultation with VTDEC. Saint-Gobain will coordinate with VTDEC to provide each property owner the results of each sampling event.

On an annual basis, a summary of the private well analytical results collected under this LTM Plan will be tabulated and provided to VTDEC. The annual summary will also include a compilation of the private wells

sampled, where property access was denied or could not be coordinated, and other relevant notes collected during the sampling events.

List of Attachments

Table E1	List of Private Wells without POET Systems
Figure E1	Long-Term Monitoring Sampling Locations of Private Wells without POET Systems

Acronyms

ANR	Agency of Natural Resources
CAAI	Corrective Action Area I
CAAII	Corrective Action Area II
CAAs OUB	Corrective Action Areas – Operable Unit B
FSP	Field Sampling Plan
LTM	Long-Term Monitoring
PFAS	per- and poly-fluoroalkyl substances
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
PHASP	Project-Specific Health and Safety Plan
POET	point-of-entry treatment
ppt	parts per trillion
QAPP	Quality Assurance Project Plan
VTDEC	Vermont Department of Environmental Conservation

Table E1
List of Private Wells without POET Systems*
Bennington, VT
Saint-Gobain Performance Plastics

House #	Street	Address	Town	CAA	OU
OUA					
137	Harwood Hill Rd	137 Harwood Hill Rd	Bennington	CAAII	OUA
140	Harwood Hill Rd	140 Harwood Hill Rd	Bennington	CAAII	OUA
635	Harwood Hill Rd	635 Harwood Hill Rd	Bennington	CAAII	OUA
1161	Harwood Hill Rd	1161 Harwood Hill Rd	Bennington	CAAII	OUA
1440	Harwood Hill Rd	1440 Harwood Hill Rd	Bennington	CAAII	OUA
1506	Harwood Hill Rd	1506 Harwood Hill Rd	Bennington	CAAII	OUA
1726	Harwood Hill Rd	1726 Harwood Hill Rd	Bennington	CAAII	OUA
1868	Harwood Hill Rd	1868 Harwood Hill Rd	Bennington	CAAII	OUA
589	Houghton Ln	589 Houghton Ln	Bennington	CAAII	OUA
609	Houghton Ln	609 Houghton Ln	Bennington	CAAII	OUA
628	Houghton Ln	628 Houghton Ln	Bennington	CAAII	OUA
34	Mcintosh Ln	34 McIntosh Ln	Bennington	CAAII	OUA
24	Settlers Rd	24 Settlers Rd	Bennington	CAAII	OUA
16	Wilkie Way	16 Wilkie Way	Bennington	CAAI	OUA
272	Willow Rd	272 Willow Rd	Bennington	CAAII	OUA
401	Willow Rd	401 Willow Rd	Bennington	CAAII	OUA
540	Willow Rd	540 Willow Rd	Bennington	CAAII	OUA
596	Willow Rd	596 Willow Rd	Bennington	CAAII	OUA
634	Willow Rd	634 Willow Rd	Bennington	CAAII	OUA
655	Willow Rd	655 Willow Rd	Bennington	CAAII	OUA
702	Willow Rd	702 Willow Rd	Bennington	CAAII	OUA
807	Willow Rd	807 Willow Rd	Bennington	CAAII	OUA
839	Willow Rd	839 Willow Rd	Bennington	CAAII	OUA
907	Willow Rd	907 Willow Rd	Bennington	CAAII	OUA
OUB					
106	Airport Rd	106 Airport Rd S	Bennington	CAAI	OUB
590	Airport Rd	590 Airport Rd	Bennington	CAAI	OUB
623	Airport Rd	623 Airport Rd N	Bennington	CAAI	OUB
740	Airport Rd	740 Airport Rd N	Bennington	CAAI	OUB
53	Austin Hill Rd	53 Austin Hill Rd	Bennington	CAAI	OUB
159	Austin Hill Rd	159 Austin Hill Rd	Bennington	CAAI	OUB
520	Autumn Acres Rd	520 Autumn Acres Rd	Bennington	CAAII	OUB
3	Carpenter Ln	3 Carpenter Ln	Bennington	CAAII	OUB
51	East Rd	51 East Rd	Shaftsbury	CAAII	OUB
117	East Rd	117 East Rd	Bennington	CAAII	OUB
1123	East Rd	1123 East Rd	Bennington	CAAII	OUB
126	Fox Hill Rd	126 Fox Hill Rd	Bennington	CAAII	OUB
146	Furnace Brook Rd	146 Furnace Brook Rd	Bennington	CAAII	OUB
171	Furnace Brook Rd	171 Furnace Brook Rd	Bennington	CAAII	OUB
550	Gulley Ln	550 Gulley Ln	Bennington	CAAII	OUB
115	Harrington Rd	115 Harrington Rd	Shaftsbury	CAAI	OUB
147	Harrington Rd	147 Harrington Rd	Shaftsbury	CAAI	OUB
519	Harrington Rd	519 HARRINGTON RD	Bennington	CAAI	OUB
801	Harrington Rd	801 Harrington Rd	Bennington	CAAI	OUB
843	Harrington Rd	843 Harrington Rd	Bennington	CAAI	OUB
882	Harrington Rd	882 Harrington Rd	Bennington	CAAI	OUB
1076	Harrington Rd	1076 Harrington Rd	Bennington	CAAI	OUB
1151	Harrington Rd	1151 Harrington Rd	Bennington	CAAI	OUB
1452	Harrington Rd	1452 Harrington Rd	Bennington	CAAI	OUB
1645	Harrington Rd	1645 Harrington Rd	Bennington	CAAI	OUB
1591	Harrington Rd	1591 Harrington Rd	Bennington	CAAI	OUB

Table E1
List of Private Wells without POET Systems*
Bennington, VT
Saint-Gobain Performance Plastics

House #	Street	Address	Town	CAA	OU
1860	Harwood Hill Rd	1860 Harwood Hill Rd	Bennington	CAAII	OUB
2006	Harwood Hill Rd	2006 Harwood Hill Rd	Bennington	CAAII	OUB
2116	Harwood Hill Rd	2116 Harwood Hill Rd	Bennington	CAAII	OUB
2196	Harwood Hill Rd	2196 Harwood Hill Rd	Bennington	CAAII	OUB
2232	Harwood Hill Rd	2232 Harwood Hill Rd	Bennington	CAAII	OUB
344	North St	344 North St	Bennington	CAAII	OUB
734	Orchard Rd	734 Orchard Rd	Bennington	CAAII	OUB
830	Orchard Rd	830 Orchard Rd	Bennington	CAAII	OUB
574	Ore Bed Rd	574 Ore Bed Rd	Bennington	CAAI	OUB
759	Ore Bed Rd	759 Ore Bed Rd	Bennington	CAAI	OUB
995	Ore Bed Rd	995 Ore Bed Rd	Bennington	CAAI	OUB
12	Outwater Rd	12 Outwater Rd	Shaftsbury	CAAII	OUB
55	Outwater Rd	55 Outwater Rd	Shaftsbury	CAAII	OUB
112	Outwater Rd	112 Outwater Rd	Shaftsbury	CAAII	OUB
675	Overlea Rd	675 Overlea Rd	Bennington	CAAII	OUB
752	Overlea Rd	752 Overlea Rd	Bennington	CAAII	OUB
768	Overlea Rd	768 Overlea Rd	Bennington	CAAII	OUB
311	Rice Ln	311 Rice Ln	Bennington	CAAII	OUB
313	Rice Ln	313 Rice Ln	Bennington	CAAII	OUB
340	Rice Ln	340 Rice Ln	Bennington	CAAII	OUB
361	Rice Ln	361 Rice Ln	Bennington	CAAII	OUB
447	Rice Ln	447 Rice Ln	Bennington	CAAII	OUB
453	Rice Ln	453 Rice Ln	Bennington	CAAII	OUB
509	Rice Ln	509 Rice Ln	Bennington	CAAII	OUB
558	Rice Ln	558 Rice Ln	Bennington	CAAII	OUB
565	Rice Ln	565 Rice Ln	Bennington	CAAII	OUB
593	Rice Ln	593 Rice Ln	Bennington	CAAII	OUB
616	Rice Ln	616 Rice Ln	Bennington	CAAI	OUB
623	Rice Ln	623 Rice Ln	Bennington	CAAII	OUB
674	Rice Ln	674 Rice Ln	Bennington	CAAI	OUB
688	Rice Ln	688 Rice Ln	Bennington	CAAI	OUB
691	Rice Ln	691 Rice Ln	Bennington	CAAI	OUB
726	Rice Ln	726 Rice Ln	Bennington	CAAI	OUB
842	River Rd	842 River Rd	Bennington	CAAI	OUB
1176	River Rd	1176 River Rd	Bennington	CAAI	OUB
1709	River Rd	1709 River Rd	Bennington	CAAII	OUB
16	Rocky Ln	16 Rocky Ln	Bennington	CAAII	OUB
88	Rocky Ln	88 Rocky Ln	Bennington	CAAII	OUB
171	Rocky Ln	171 Rocky Ln	Bennington	CAAII	OUB
232	Rocky Ln	232 Rocky Ln	Bennington	CAAII	OUB
270	Rocky Ln	270 Rocky Ln	Bennington	CAAII	OUB
306	Rocky Ln	306 Rocky Ln	Bennington	CAAII	OUB
364	Rocky Ln	364 Rocky Ln	Bennington	CAAII	OUB
712	Rocky Ln	712 Rocky Ln	Bennington	CAAII	OUB
901	Rocky Ln	901 Rocky Ln	Bennington	CAAII	OUB
1001	Rocky Ln	1001 Rocky Ln	Bennington	CAAII	OUB
73	Settlers Rd	73 Settlers Rd	Bennington	CAAII	OUB
101	Settlers Rd	101 Settlers Rd	Bennington	CAAII	OUB
177	Settlers Rd	177 Settlers Rd	Bennington	CAAII	OUB
178	Settlers Rd	178 Settlers Rd	Bennington	CAAII	OUB
245	Settlers Rd	245 Settlers Rd	Bennington	CAAII	OUB
145	Spring Hill Rd	145 Spring Hill Rd	Bennington	CAAII	OUB

Table E1
List of Private Wells without POET Systems*
Bennington, VT
Saint-Gobain Performance Plastics

House #	Street	Address	Town	CAA	OU
259	Spring Hill Rd	259 Spring Hill Rd	Bennington	CAAII	OUB
290	Spring Hill Rd	290 Spring Hill Rd	Bennington	CAAII	OUB
291	Spring Hill Rd	291 Spring Hill Rd	Bennington	CAAII	OUB
310	Spring Hill Rd	310 Spring Hill Rd	Bennington	CAAII	OUB
340	Spring Hill Rd	340 Spring Hill Rd	Bennington	CAAII	OUB
383	Spring Hill Rd	383 Spring Hill Rd	Bennington	CAAII	OUB
43	Spur Rd	43 Spur Rd	Shaftsbury	CAAII	OUB
62	Spur Rd	62 Spur Rd	Shaftsbury	CAAII	OUB
113	Spur Rd	113 Spur Rd	Shaftsbury	CAAII	OUB
12	Stateline Road South	12 Stateline Road South	Shaftsbury	CAAII	OUB
484	Sugar Maple Ln	484 Sugar Maple Ln	Bennington	CAAII	OUB
518	Sugar Maple Ln	518 Sugar Maple Ln	Bennington	CAAII	OUB
11	Town Line Rd	11 Town Line Rd	Shaftsbury	CAAII	OUB
24	Town Line Rd	24 Town Line Rd	Bennington	CAAII	OUB
105	Town Line Rd	105 Town Line Rd	Shaftsbury	CAAII	OUB
174	Town Line Rd	174 Town Line Rd	Bennington	CAAII	OUB
599	Town Line Rd	599 Town Line Rd	Shaftsbury	CAAII	OUB
646	Town Line Rd	646 Town Line Rd	Shaftsbury	CAAII	OUB
743	Town Line Rd	743 TOWN LINE RD	Shaftsbury	CAAII	OUB
881	Town Line Rd	881 Town Line Rd	Bennington	CAAII	OUB
933	Town Line Rd	933 Town Line Rd	Bennington	CAAII	OUB
972	Vail Rd	972 Vail Rd	Bennington	CAAI	OUB
1068	Vail Rd	1068 Vail Rd	Bennington	CAAI	OUB
1101	Vail Rd	1101 Vail Rd	Bennington	CAAI	OUB
1120	Vail Rd	1120 Vail Rd	Bennington	CAAI	OUB
1152	Vail Rd	1152 Vail Rd	Bennington	CAAI	OUB
1172	Vail Rd	1172 Vail Rd	Bennington	CAAI	OUB
1244	Vail Rd	1244 Vail Rd	Bennington	CAAI	OUB
1306	Vail Rd	1306 Vail Rd	Bennington	CAAI	OUB
1312	Vail Rd	1312 Vail Rd	Bennington	CAAI	OUB
1337	Vail Rd	1337 Vail Rd	Bennington	CAAI	OUB
1389	Vail Rd	1389 Vail Rd	Bennington	CAAI	OUB
1431	Vail Rd	1431 Vail Rd	Bennington	CAAI	OUB
1506	Vail Rd	1506 Vail Rd	Bennington	CAAI	OUB
1575	Vail Rd	1575 Vail Rd	Bennington	CAAI	OUB
1584	Vail Rd	1584 Vail Rd	Bennington	CAAI	OUB
1602	Vail Rd	1602 Vail Rd	Bennington	CAAI	OUB
1645	Vail Rd	1645 Vail Rd	Bennington	CAAI	OUB
1690	Vail Rd	1690 Vail Rd	Bennington	CAAI	OUB
1742	Vail Rd	1742 Vail Rd	Bennington	CAAI	OUB
70	Village Ln	70 Village Ln	Bennington	CAAII	OUB
109	Village Ln	109 Village Ln	Bennington	CAAII	OUB
1220	Vt Route 67 E	1220 VT Route 67 E	Shaftsbury	CAAII	OUB
1466	Vt Route 67 E	1466 VT Route 67 E	Shaftsbury	CAAII	OUB
1477	Vt Route 67 E	1477 VT Route 67 E	Shaftsbury	CAAII	OUB
193	Vt Route 67 W	193 VT Route 67 W	Shaftsbury	CAAI	OUB
211	Vt Route 67 W	211 VT Route 67 W	Shaftsbury	CAAI	OUB
239	Vt Route 67 W	239 VT Route 67 W	Shaftsbury	CAAI	OUB
535	Vt Route 67 W	535 VT Route 67 W	Shaftsbury	CAAI	OUB
606	Vt Route 67 W	606 VT Route 67 W	Shaftsbury	CAAI	OUB
686	Vt Route 67 W	686 VT Route 67 W	Shaftsbury	CAAI	OUB
1118	Vt Route 67 W	1118 VT Route 67 W	Shaftsbury	CAAII	OUB

Table E1
List of Private Wells without POET Systems*
Bennington, VT
Saint-Gobain Performance Plastics

House #	Street	Address	Town	CAA	OU
1278	Vt Route 67 W	1278 VT Route 67 W	Shaftsbury	CAAII	OUB
1414	Vt Route 67 W	1414 VT Route 67 W	Shaftsbury	CAAII	OUB
1382	Walloomsac Rd	1382 Walloomsac Rd	Bennington	CAAII	OUB
1397	Walloomsac Rd	1397 Walloomsac Rd	Bennington	CAAII	OUB
1427	Walloomsac Rd	1427 Walloomsac Rd	Bennington	CAAII	OUB
1563	Walloomsac Rd	1563 Walloomsac Rd	Bennington	CAAI	OUB
1616	Walloomsac Rd	1616 Walloomsac Rd	Bennington	CAAII	OUB
900	West Rd	900 West Rd	Bennington	CAAII	OUB
24	Westwood Dr	24 Westwood Dr	Bennington	CAAI	OUB
43	Westwood Dr	43 Westwood Dr	Bennington	CAAI	OUB
110	Westwood Dr	110 Westwood Dr	Bennington	CAAI	OUB
213	White Creek Road	213 White Creek Road	Shaftsbury	CAAII	OUB

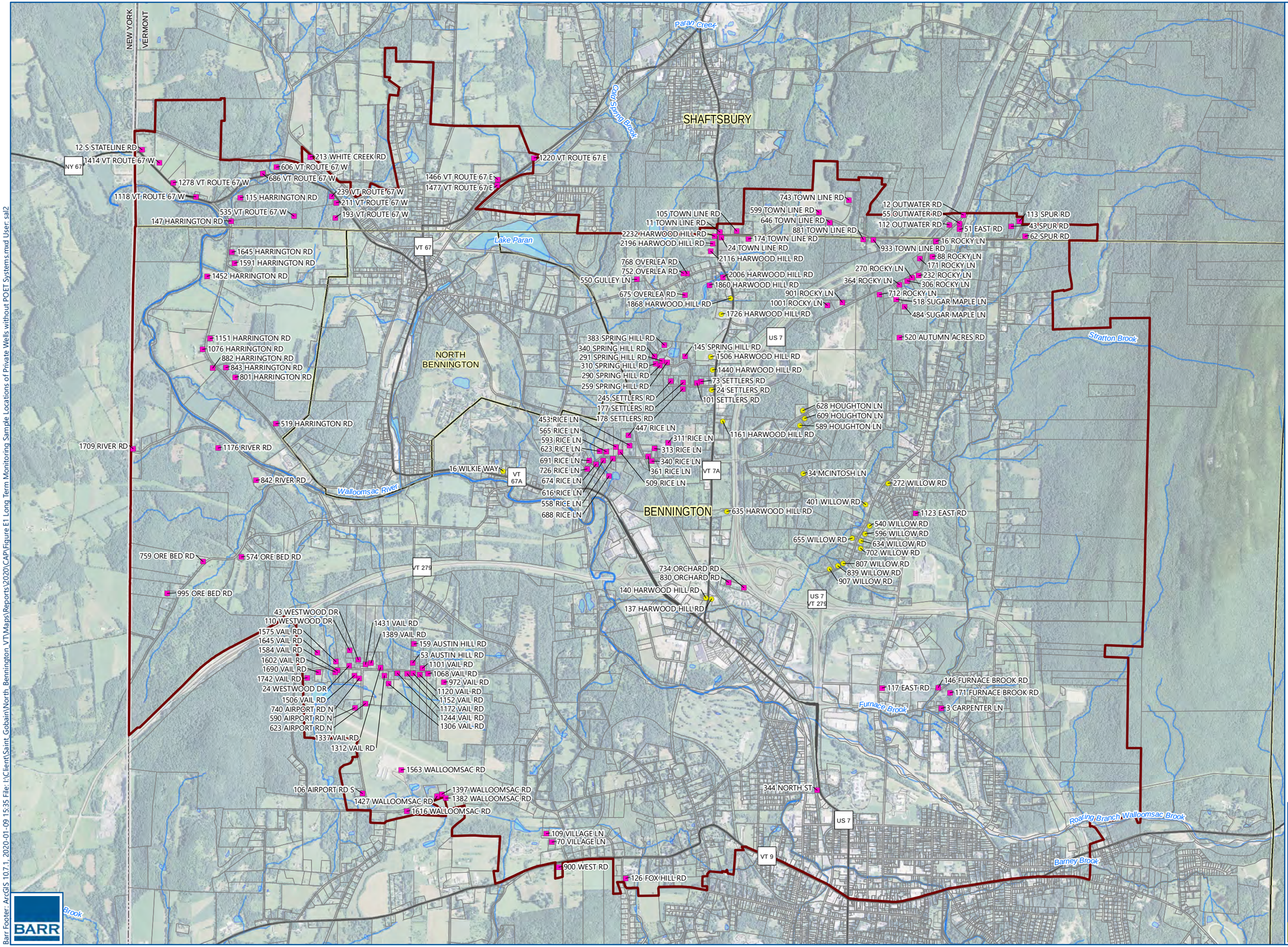
Notes:

* List subject to change in consultation with VTDEC

NA - not available

OUA: Operable Unit A

OUB: Operable Unit B



LTM Well
- OUA
- OUB

Corrective Action Area
Parcel Boundary
State Boundary
Village/Township Boundary

Locations subject to change, in consultation with VTDEC.

N

0 2,500
Feet

LONG-TERM MONITORING SAMPLE LOCATIONS OF PRIVATE WELLS WITHOUT POET SYSTEMS
Bennington, VT
Saint-Gobain

FIGURE E1

BARR

Barr Footer: ArcGIS 10.7.1, 2020-01-09 15:35 File: I:\Client\Saint_Gobain\North_Bennington_VT\Maps\Reports\2020\CAP\Figure E1 Long Term Monitoring Sample Locations of Private Wells without POET Systems.mxd User: sal2

Attachment F

Long-Term Monitored Natural Attenuation Plan for PFAS in Groundwater and Soil

Long-Term Monitored Natural Attenuation Plan for PFAS in Groundwater and Soil

Corrective Action Areas I and II – Operable Unit B
Attachment F

Prepared for
Saint-Gobain Performance Plastics

March 2020

F1.0 Introduction

This Plan for performing Long-Term Monitoring for Natural Attenuation (Long-Term MNA Plan) of per- and polyfluoroalkyl substances (PFAS) in groundwater and soil, prepared by Barr Engineering Co. (Barr) on behalf of Saint-Gobain Performance Plastics (Saint-Gobain), complies with the Consent Order and Final Judgment, dated May 28, 2019 (Consent Order). This Consent Order supersedes the Consent Order and Final Judgment, dated October 2, 2017. Specifically, this plan addresses Appendix A, Section IV Corrective Action Area II – Operable Unit B, paragraph 8g, of the Consent Order, which requires a long-term monitoring plan to evaluate the effectiveness of natural attenuation of perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), and perfluorononanoic acid (PFNA) in soil and groundwater in the corrective action areas (CAAs).

Natural attenuation is a remediation strategy that relies upon natural processes such as biodegradation, chemical reactions, dilution, evaporation, and/or sorption to decrease concentrations of contaminants in soil and groundwater. Monitoring is required to assess the effectiveness of this remedy; therefore, the process is referred to as monitored natural attenuation (MNA).

F2.0 MNA Sampling Plan

The purpose of this Long-Term MNA Plan is to establish the process and procedures for monitoring groundwater and soils in the CAAs to assess the effectiveness of natural attenuation of PFAS.

F2.1 Proposed Groundwater Monitoring

F2.1.1 Groundwater Monitoring Network

The groundwater monitoring network for this Long-Term MNA Plan consists of 22 wells located in the CAAs (Figure F1). Available well construction information is summarized in Table F1. These wells were either installed as part of previous investigations at Water Street and Northside Drive, were private water supply wells that have been or will be converted to monitoring wells, or active private water supply wells. The wells selected for this Plan are based on a combination of the following factors:

- Representation of a range of PFAS concentrations, including several wells located near Water Street and Northside Drive;
- The availability of wells screened in the unconsolidated aquifers for monitoring; and
- Spatial distribution within the CAAs including potential monitoring points along the perimeter and throughout the interior of the CAAs.

Within this Long-Term MNA Plan, these wells are referred to as “compliance wells.” As groundwater quality trends are observed during the process of MNA, compliance wells may be added to, or removed from, the monitoring network to meet the objectives of this Long-Term MNA Plan, as determined by the Agency of Natural Resources (ANR). The groundwater monitoring network will be re-evaluated annually as part of the annual reporting process.

F2.1.2 Groundwater Monitoring Frequency

Groundwater samples will be collected from compliance wells on a quarterly basis for two years prior to the evaluation of groundwater quality data and analysis of groundwater quality trends as they relate to the performance standard established in Appendix A, paragraph 8(h) of the Consent Order. The current regulatory standard established by the Groundwater Protection Rule and Strategy is 20 parts per trillion (ppt) for the combined concentrations (sum of): PFOA, PFOS, PFHxS, PFHpA, and PFNA.

If the PFAS concentrations at a compliance well are below the regulatory standard and are stable or follow a decreasing trend, the sampling frequency will be reduced or eliminated, as described in Appendix A, paragraph 8(h) of the Consent Order. If the PFAS concentrations are at or above the regulatory standard, but suggest an increasing trend, the sampling frequency will either remain the same or be adjusted following consultation with Vermont Department of Environmental Conservation (VTDEC) and shall be consistent with paragraph 8(b)(ii), 8(c), and 8(f) of Appendix A of the Consent Order. The sampling frequency change will be based primarily on evaluating the compliance well, the private wells monitored as per the Long-Term Monitoring Plan (Attachment E), and the point-of-entry treatment (POET) water quality data.

Monitoring at a compliance well will continue at a frequency agreed to by VTDEC and Saint-Gobain until the performance standard is met.

F2.2 Proposed Soil Monitoring

In March 2016, over 130 soil samples were collected from Corrective Action Area I to evaluate the presence and distribution of PFOA in shallow soils (0 to 2 feet below ground surface (bgs)) at and in the vicinity of Water Street. The PFAS concentrations in these samples were below the residential and nonresidential soil standards for PFAS compounds (sum of PFHpA, PFHxS, PFNA, PFOS and PFOA) of 1.22 milligrams per kilogram (mg/kg) and 14.4 mg/kg, respectively. The highest PFAS concentration in the upper 2 feet bgs of soil was 0.045 mg/kg.

During the 2017 Conceptual Site Model Site Investigation, 569 soil samples were collected to further assess the distribution of PFAS in soil and groundwater in Corrective Action Area I and Corrective Action Area II. The PFAS concentrations in these soil samples were below the residential and nonresidential soil standards and the highest PFAS concentration was 0.158 mg/kg in the shallow surface soil.

A site investigation was completed at Water Street in 2018 and a total of 104 soil samples were collected to evaluate the distribution of PFAS. The PFAS concentrations in these samples were below the residential and nonresidential soil standards and the highest PFAS concentration was 0.392 mg/kg in the shallow surface soil.

Based on these data, the PFAS concentrations are below the residential and nonresidential soil standards and do not constitute a human direct contact concern. Therefore, performing additional soil sampling over time to assess the natural attenuation of PFAS is not proposed at this time.

If soil analytical data collected in subsequent investigations are detected at PFAS concentrations at or above the residential or nonresidential soil standard, as applicable, soil sampling to demonstrate the effectiveness of natural attenuation in soil will be completed at the locations with PFAS concentrations at or above the residential or nonresidential soil standard, as applicable.

Soil sampling for MNA evaluation will commence on a semiannual basis along with establishing an institutional control to the extent required. Once the PFAS concentration in soil is stable or decreases below the residential or nonresidential soil standard, as applicable, the sampling will be considered complete. If soil monitoring results demonstrate an increasing trend in PFAS, soil monitoring will continue on a semiannual basis.

MNA soil samples will be composite samples. Soil samples will be collected at a two-foot interval (from ground surface to a depth of two feet) within a ten-foot radius of the original sample location. A composite sample will consist of three near equal-volume subsamples from the same vertical depth interval within the general sample location (i.e., ten-foot radius of the original sample location). The subsamples will be homogenized to create one analytical sample.

F2.3 Sample Collection Procedures and Methods

Activities conducted under this Long-Term MNA Plan will be performed in accordance with the following supporting documents:

- Field Sampling Plan (FSP), dated June 2019, which presents the standard field sampling and data gathering procedures to be followed during implementation of the monitoring activities.
- Quality Assurance Project Plan (QAPP), dated July 2019, which provides project-specific organization details, objectives, data acquisition, data assessment, oversight, data review procedures, and analytical parameters. Protocols for sample collection, handling, storage, chain-of-custody, laboratory and/or field analyses, data evaluation and validation, and reporting are also described.
- Project-Specific Health and Safety Plan (PHASP), dated December 2018, which addresses the potential health and safety hazards that may be encountered while performing the work.

Samples will be analyzed using a modified version identified in EPA Method 537.1 (2018) and will include the following 18 analytes:

Analyte	Acronym	Chemical Abstract Services Registry Number (CASRN)
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluoroheptanoic acid	PFHpA	375-85-9

Analyte	Acronym	Chemical Abstract Services Registry Number (CASRN)
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluorononanoic acid	PFNA	375-95-1
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorotetradecanoic acid	PFTA	376-06-7
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluoroundecanoic acid	PFUnA	2058-94-8
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4

F2.4 Performance Standards for Soil and Groundwater

The performance standards for groundwater and soil include:

- **Groundwater** – PFAS concentrations at groundwater compliance wells established by the Secretary exhibit a stable or decreasing trend, meaning PFAS concentrations are below the performance standard for eight rounds of quarterly sampling and the statistical trend analysis for eight quarters of sampling shows an overall downward trend in PFAS concentrations or a flat trend if the concentrations are below the regulatory standard.

- **Soil** – PFAS concentrations at soil compliance points are below the residential or nonresidential soil standard, as applicable, established by the Secretary or appropriate institutional controls are in place.

F3.0 Schedule

Sampling in accordance with this Long-Term MNA Plan will be initiated in the first quarter of 2020 following approval of the Long-Term MNA Plan. Groundwater samples will be collected on a quarterly basis for two years or until the concentrations are consistently below the regulatory standard and show no increasing concentration trend, contingent on gaining access to the wells each quarter.

If PFAS concentrations in soil are above the residential or nonresidential soil standard, as applicable, soil samples will be collected on a semiannual basis until the concentrations are below the residential or nonresidential soil standard, as applicable.

Laboratory analytical results for each sampling event will be provided to VTDEC in accordance with the reporting schedule defined by the Consent Order.

F4.0 Reporting

Monitoring data will be used to document whether natural attenuation is effectively occurring. An Annual MNA Report will be submitted to the VTDEC by March 31st of each year. The Annual MNA Report will include a summary of completed tasks and analytical data for soil, if applicable, and groundwater.

Following eight quarterly events of groundwater monitoring, a statistical evaluation of data will be completed to determine if there are stable or decreasing trends of PFAS concentrations in groundwater. Groundwater results collected under this Long-Term MNA Plan will be used to determine if the sampling frequency is adequate. Similarly, soil results collected under this Long-Term MNA Plan will be evaluated to determine whether a decreasing trend is present. The Annual MNA Report will also consider the private well and POET water quality data to assess the MNA trends in context of broader groundwater quality trends.

Following the annual data evaluation, any modifications to this Long-Term MNA Plan will be made in consultation with and approval by VTDEC and shall be consistent with paragraph 8(b)(ii), 8(c), and 8(f) of Appendix A of the Consent Order. In the event that unanticipated increasing groundwater or soil concentration trends are observed, that information will be communicated to the VTDEC, which may occur separately from, and in advance of, the annual report.

List of Attachments

Table F1	Proposed Long-Term MNA Groundwater Sample Locations
Figure F1	Compliance Wells Long-Term MNA Plan

Acronyms

ANR	Agency of Natural Resources
bgs	below ground surface
CAAs	corrective action areas
FSP	Field Sampling Plan
MNA	monitored natural attenuation
PFAS	per- and poly-fluoroalkyl substances
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
PHASP	Project-Specific Health and Safety Plan
POET	point-of-entry treatment

ppt	parts per trillion
QAPP	Quality Assurance Project Plan
VTDEC	Vermont Department of Environmental Conservation

Table F1
Proposed Long-Term MNA Groundwater Sample Locations
Saint-Gobain Performance Plastics
Bennington, VT

Well Identification / Address	Well Type (screen interval in feet bgs)	PFOA (ppt)
SG3-MW17-WWTP	Unconsolidated (25-35)	120
SG3-MW17-07	Unconsolidated (55-75)	8 J
558 Murphy Road	Unknown (57-500+)	670
17 Jennings Drive	Unknown	14
548 Vail Road	Unknown (40-380)	95 J
90 Riverside	Unknown (21-381)	640
662 Route 67 West	Unknown	71
85 Silk Road	Unknown (37-170)	56 J
MW01 (Former Chemfab Water Street Facility)	Unconsolidated (5-15)	6000
MW02 (Former Chemfab Water Street Facility)	Unconsolidated (5-13)	10000
MW03S (Former Chemfab Water Street Facility)	Unconsolidated (5-13)	3200
MW06S (Former Chemfab Water Street Facility)	Unconsolidated (5-13.5)	2000
MW07S (Former Chemfab Water Street Facility)	Unconsolidated (9-19)	1100
748 Harvest Hills Drive	Unknown	123
1688 Harwood Hill Road	Unknown	41.1
155 Harwood Hill Road	Unknown	33
108 Michaels Drive	Unknown[1]	240
1747 East Road	Unknown	27.7
1 Carpenter Lane	Unknown[1]	37.6
113 Spur Road	Unknown	3.46 J
SG5-MW03 (Former Chemfab Northside Drive Facility)	Unconsolidated (TBD)	120
SG5-MW06 (Former Chemfab Northside Drive Facility)	Unconsolidated (TBD)	1000 J

Notes:

[1] Well evaluation will be completed during conversion of well from residential supply well to groundwater monitoring well.

J The result is an estimated quantity; the associated numerical value is the approximate concentration of the analyte in the sample.

TBD	To be determined
NA	Not available
MNA	monitored natural attenuation
bgs	below ground surface
PFOA	perfluorooctanoic acid
ppt	parts per trillion

NEW YORK
VERMONT
NY 67
VT 67
VT 67A
VT 279
VT 7A
VT 9
US 7
US 7;VT 279
748 Harvest Hills Dr
662 VT Route 67 W
Cold Spring Brook
SHAFTSBURY
Lake Paran
Paran Creek
113 Spur Rd
1688 Harwood Hill Rd
Stratton Brook
NORTH BENNINGTON
SG3-MW17-07
Former Chemfab (Water Street)
1747 East Rd
108 Michaels Dr
SG3-MW17-WWTP
MW02S
MW01
MW03S
MW06S
MW07S
558 Murphy Rd
90 Riverside Dr
155 Harwood Hill Rd
BENNINGTON
548 Vail Rd
Former Chemfab (Northside Drive)
SG5-MW03
SG5-MW06
Furnace Brook
1 Carpenter Ln
85 Silk Rd
Roaring Branch
Walloomsac Brook
17 Jennings Dr
Walloomsac River
Barney Brook

PFOA (ng/l),
Max Value (as of 1/8/2020)

- > 1000
- 100 - 1000
- 20 - 100
- < 20
- ND
- Corrective Action Area
- Village/Township Boundary
- State Boundary

Locations subject to change, in consultation with VTDEC.

N

0 2,500
Feet

COMPLIANCE WELLS
LONG-TERM MNA PLAN
(REVISED JANUARY 2020)
Bennington, VT
Saint-Gobain

FIGURE F1

BARR

Barr Footer: ArcGIS 10.7.1, 2020-01-13 15:12 File: I:\Client\Saint_Gobain\North_Bennington_VT\Maps\Reports\2020\CAP\Figure F1 Compliance Wells.mxd User: sal2

Attachment G

Institutional Control Plan

Institutional Control Plan

Corrective Action Areas I and II – Operable Unit B
Attachment G

Prepared for
Saint-Gobain Performance Plastics

March 2020

G1.0 Introduction

Pursuant to paragraph 8i of the Consent Order and Final Judgment, dated May 28, 2019 (Consent Order), Saint-Gobain is required to submit an Institutional Control Plan that addresses institutional controls anticipated to be required to implement the selected remedial actions for the Corrective Action Areas (CAAs), Operable Unit A (OUA), and Operable Unit B (OUB). This Consent Order supersedes and replaces the Consent Order and Final Judgment, dated October 2, 2017.

G2.0 Institutional Control Plan

Institutional controls will be required to implement the remedy selected for CAAs OUA. The State is required to reclassify groundwater in CAAs OUA in accordance with the Investigation and Remediation of Contaminated Properties Rule (IROCPR, dated July 6, 2019) and state groundwater protection rules to prohibit future use of this groundwater for human consumptive or other residential purposes in areas serviced by the municipal water line. Saint-Gobain will continue to consult with the State regarding the reclassification of groundwater in CAAs OUA.

Saint-Gobain also proposes to reclassify groundwater in CAAs OUB as Class IV groundwater with the provision that its use as a potable water supply conforms to the protocols established in the Corrective Action Plan, Corrective Action Areas I and II – Operable Unit B, North Bennington and Bennington (CAP2).

The plans included in CAP2 that comprise the remedial action for OUB and confirm that wells used for potable water supply within OUB meet the regulatory standards established in the Consent Order are referenced below:

- **Well Replacement Plan (Attachment A)** – addresses potential well replacements and associated activities at properties at which the per- and polyfluoroalkyl substances (PFAS) concentrations are at or above the regulatory standard.
- **New Well Testing Plan (Attachment B)** – addresses sampling requirements at properties with newly proposed and installed wells.
- **Bottled Water Plan (Attachment C)** – addresses interim actions (i.e., supplying bottled water) upon identification of PFAS concentrations at or above the groundwater regulatory standard in a replacement or any wells in the long-term monitoring plan.
- **POET Operation, Monitoring, and Maintenance (OM&M) Manual (Attachment D)** – addresses point-of-entry treatment (POET) OM&M requirements at properties with POET systems.
- **Long-Term Monitoring Plan (Attachment E)** – addresses the sampling requirements for drinking-water wells without POETs.

The current regulatory standard established by the Groundwater Protection Rule and Strategy is 20 parts per trillion (ppt) for the combined concentrations (sum of): perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), and perfluorononanoic acid (PFNA).

G3.0 Schedule

Saint-Gobain prepared and submitted a draft groundwater reclassification petition to Vermont Agency of Natural Resources (ANR) in November 2018 and Vermont ANR issued comments to that draft, dated February 8, 2019. Subsequently, a technical memorandum was issued by Saint-Gobain on August 12, 2019, with supporting figures on September 6, 2019, to which Vermont ANR issued comments on November 27, 2019. Saint-Gobain and Vermont ANR continue to coordinate in preparing a revised groundwater reclassification petition pursuant to the Consent Order.

G4.0 Reporting

Reporting requirements will be determined following initial approval of this plan by Vermont ANR.

Acronyms

ANR	Agency of Natural Resources
CAAs	Corrective Action Areas
CAP2	Corrective Action Plan 2 (2019)
IROCPR	Investigation and Remediation of Contaminated Properties Rule
OUA	Operable Unit A
OUB	Operable Unit B
PFAS	per- and polyfluoroalkyl substances
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
POET	point-of-entry treatment system
ppt	parts per trillion

Attachment H

Public Notice

[Date]

Public Notice

Corrective Action Plan for Private Wells
Corrective Action Areas I and II - Operable Unit B
North Bennington and Bennington

Corrective Action Plan 2 (CAP2) is has been developed to address the presence of per- and polyfluoroalkyl substances (PFAS) in groundwater and certain drinking water supply wells in portions of the Towns of Bennington and Shaftsbury and the Village of North Bennington. CAP2 specifically addresses properties in an area designated Operable Unit B in Corrective Action Area I and Corrective Action Area II pursuant to the Consent Order and Final Judgment between the Vermont Agency of Natural Resources (ANR) and Saint-Gobain Performance Plastics, dated May 28, 2019. CAP2 includes the following plans:

- **Well Replacement Plan** – addresses potential well replacement and associated activities at properties at which the PFAS concentrations are at or above the groundwater enforcement standard.
- **New Well Testing Plan** – addresses sampling requirements at properties with newly proposed and installed wells.
- **Bottled Water Plan** – addresses interim actions (i.e., supplying bottled water) upon identification of PFAS concentrations at or above the groundwater enforcement standard in a new or replacement well or any well subject to the long-term monitoring plan.
- **POET Operation, Monitoring and Maintenance (OM&M) Manual** – addresses point of entry treatment (POET) system OM&M requirements at properties with POET systems.
- **Long-Term Monitoring Plan** – addresses the sampling requirements for drinking-water wells without POET systems.
- **Long-Term MNA Plan** – addresses the long-term plan to monitor natural attenuation (MNA) of PFAS concentrations in soil and groundwater until the associated soil and groundwater enforcement standards are met; and
- **Institutional Control Plan** – addresses the institutional controls associated with Corrective Action Area I OUB and Corrective Action Area II OUB, as applicable.

More detail about this proposed corrective action can be found in CAP2. CAP2 is available for review and comment online at [*insert hyperlink*] and at the Bennington Town Offices, located at 205 South Street, Bennington VT 05201.

Per the requirements of Investigation and Remediation of Contaminated Properties Rule (IROCPR) § 35-506, dated July 6, 2019, interested persons shall have 30 days from the date of the notice to comment on proposed CAP2. Also, any interested person may submit a request to the ANR to have a public informational meeting within 14 days of the date of the notice.

If you have any comments on proposed CAP2, please send your comments in writing by **Xxxxxx XX, 2019**, to Richard Spiese or John Schmeltzer at:

VT ANR/Department of Environmental Conservation
Waste Management and Prevention Division
1 National Life Dr – Davis 1
Montpelier VT 05620-3704

Or by email

Richard.spiese@vermont.gov
john.schmeltzer@vermont.gov