PARE
CORPORATION

DATE: January 14, 2026

TO: Mark J. Purple – Town of Southborough

FROM: Timothy P. Thies, PE – Pare Corporation

CC: William J. Cundiff, PE – Southborough DPW

RE: Pare Memo RE: MassDEP January 7, 2026 Letter
Southborough Landfill Monitoring Project
Pare Project No. 18128.06

On January 7, 2026, the Massachusetts Department of Environmental Protection (MassDEP) issued a letter to the Town of Southborough regarding the Parkerville Landfill (included as Attachment No. 1). The letter stated that MassDEP, "...noted one or more water quality parameters in exceedance of application standards..." in groundwater at three monitoring well locations. Specifically, the chemical 1,4-dioxane was reported above its applicable standard of 0.3 micrograms per liter (mg/L) at monitoring wells MW-3S and MW-3D. Arsenic was reported above its applicable standard of 0.01 milligrams per liter (mg/L) at well MW-4S. In this case, the applicable standards are drinking water standards set by the US Environmental Protection Agency and guidelines set by the MassDEP. The purpose of this memorandum is to provide some background information and context for the MassDEP's letter, describe the human health threats posed by these findings, and discuss the next steps to be taken by the Town.

BACKGROUND INFORMATION

The Parkerville Landfill was in operation during the 1970s and 1980s and was used primarily for municipal solid waste (i.e., household trash). The landfill is located in a residential area of the Town with private residences immediately adjacent to the north, east, and south. The Neary Elementary School is located approximately 350 feet west of the landfill. In 1995, the Town began the process of investigating and closing the landfill in accordance with applicable MassDEP regulations. In 2000, the landfill closure was complete, and the Town began long-term post-closure environmental monitoring of groundwater and surface water beneath and near the landfill. The landfill monitoring has been performed on an annual basis for 25 years by engineering consultants, such as Pare Corporation (Pare) and others, and the results are reported to the Town and the MassDEP after each round of sampling.

The Groundwater and Surface Water Monitoring Program includes annual sampling of six (6) groundwater monitoring wells around the landfill. The groundwater monitoring wells are grouped as pairs in three (3) well clusters. Each cluster has a shallow well, noted with the suffix "S" and a deep well, noted with a suffix "D." Two of the well clusters [MW-2S and MW2D, MW-3S and MW-3D] are downgradient of the landfill and one well cluster [MW-4S and MW-4D] is upgradient of the landfill. In 1995, the Town, through their engineering consultant at the time, installed 12 microwells around the landfill to gauge groundwater depth and to map groundwater flow direction

(these wells have since been destroyed or removed). Based on these microwells, groundwater flow direction at and downgradient of the landfill is understood to flow from the southeast to the northwest. It appears groundwater flows toward a small pond and a large wetland complex located north of the Neary School access road. Both features are topographically lower in elevation than the landfill and the surrounding area. The location of the wells and groundwater flow direction, as well as a copy of the original groundwater flow map produced in 1995, are included herein as Attachment Nos. 2 and 3, respectively.

In MassDEP's recent letter, they indicated that in their review of the 2025 groundwater monitoring report prepared by Pare, they noted certain parameter concentrations exceeded an applicable standard or guideline. It is important to note that 2025 was not the first year that these parameter concentrations were reported above their applicable standards. The concentration of the volatile organic compound (VOC) 1,4-dioxane in groundwater samples collected from monitoring wells MW-3S and/or MW-3D was reported above its applicable standard in every groundwater monitoring report sent to MassDEP since 2015. In addition, the concentration of arsenic, a naturally occurring metal, was reported above its applicable standard in the groundwater samples from three different monitoring wells since 2019. While MassDEP is acting on findings from their review of the 2025 report, these findings are not a new occurrence at the landfill. A graph of 1,4-dioxane and arsenic concentrations at the landfill is included herein as Attachment Nos. 4 and 5, respectively.

THREATS TO HUMAN HEALTH

In their letter to the Town, the MassDEP has requested additional information from the Town to assess if the presence of these parameters presents a significant threat to human health. Both parameters, 1,4-dioxane and arsenic, can pose serious potential health impacts at elevated concentrations. Arsenic is a known carcinogen and can be acutely toxic at high concentrations. The US EPA has established a maximum contaminant level (MCL) for arsenic in drinking water, which is essentially the concentration below which arsenic poses no significant risk to humans. The MCL for arsenic, which is the applicable standard noted in the MassDEP letter, is 0.01 mg/L. 1,4-Dioxane is a suspected carcinogen based on animal testing, but the US EPA has not established an MCL for 1,4-dioxane. Because there is no MCL for 1,4-dioxane, but it is considered a suspected carcinogen, the MassDEP has established a drinking water guideline concentration of 0.3 mg/L.

When assessing the threat to human health created by a chemical of potential concern, two factors to consider are the pathways of exposure (i.e., how a person could become exposed to the chemical) and the concentration at which a person might be exposed. Regarding exposure, there are basically two ways a person could be exposed to 1,4-dioxane or arsenic in groundwater – through ingestion (i.e., drinking the groundwater) and, in the case of 1,4-dioxane, inhalation of a gaseous form of the compound. For the following reasons, it is unlikely that the general public would be exposed to these two parameters at Parkerville Landfill:

1. The Neary School and the majority of residences around the landfill are connected to the Town of Southborough public water system. As such, these customers drink Town water (provided by the Massachusetts Water Resources Authority, MWRA) and do not drink the groundwater from beneath or near the landfill. There are a few exceptions. Some of the residences north of the landfill on Parkerville Road have private wells and are not connected

to the Town water system. Those houses are discussed in the subsequent sections of this memorandum.

2. There are no public water supplies located downgradient of the landfill, or within at least one mile of the landfill in any direction, which include public supply wells, Zone IIs, Interim Wellhead Protection Areas, Zone As, or potentially productive aquifers, etc. This means that the parameters of concern at the landfill are unlikely to impact any current or potential public water supply sources.

3. The risk of volatilization into an indoor space, which would be the primary concern for an inhalation hazard, is very low because the landfill, where the parameters were detected, is over 100 feet to the nearest residence and 350 feet to the school. It also appears that groundwater is flowing toward a nearby pond and wetland and not toward any occupied structures. In addition, the concentration of 1,4-dioxane in groundwater is considerably less than the standard (MCP Method 1 GW-2 Standard) that the MassDEP applies when assessing potential risks of indoor air vapor intrusion. Arsenic is not an inhalation risk because it is not volatile.

There are other less common exposure pathways, such as dermal contact and injection (i.e., toxins entering through a puncture in the skin), but given that the parameters of concern exist in groundwater several feet below the ground surface, it is extremely unlikely that somebody from the public would be in a situation where they would have these types of exposure to the groundwater. For these reasons, exposure to these contaminants is considered very unlikely.

With regard to the concentration of these parameters, while they exceed applicable standards at some locations, the concentrations are generally low. As shown on the attached graphs, 1,4-dioxane has generally been reported in the range of 0.5 and 1.2 mg/L and arsenic has been reported at concentrations similar to its MCL – sometimes just above the MCL and sometimes just below the MCL. The applicable standards referenced herein are intended to be protective of individuals who might have long-term exposure to these contaminants; for example, a person who might be drinking water with these contaminants every day for 30 years could suffer ill effects due to such long-term exposure. If a person were to have incidental or short-term exposure to the groundwater beneath the landfill, which is very unlikely, the potential health effects would be less. As it pertains to 1,4-dioxane, the concentration in groundwater that would be needed to create an indoor air risk is several orders of magnitude higher than what has been reported in groundwater beneath the landfill. The MassDEP groundwater standard for 1,4-dioxane that specifically addresses volatilization and indoor vapor intrusion is 5,000 mg/L, which is 5,000 to 10,000 times higher than what has been reported in groundwater beneath the landfill. So, while it is important to monitor groundwater for these parameters now and in the future, at their current concentrations, they pose a low risk to human health.

With regard to the homeowners on Parkerville Road who have private wells, the wells closest to the landfill should be sampled and analyzed for arsenic and 1,4-dioxane, as discussed on the next page.

NEXT STEPS

The MassDEP has asked for additional information from the Town, which includes the performance of an additional round of groundwater sampling from the landfill monitoring wells. The MassDEP has also asked the Town to state whether the concentrations of 1,4-dioxane and arsenic pose a condition of *No Significant Risk*. A condition of *No Significant Risk* is defined by the Massachusetts Contingency Plan, which requires that specific conditions be met before an environmental professional can state explicitly that a condition of *No Significant Risk* exists, such as the absence of the parameters of concern at significant concentrations in drinking water derived from private wells. As noted in the prior sections of this memorandum, there are several residences along Parkerville Road that have private drinking water wells. There are two wells that are located within 500 feet of the landfill, although they do not appear to be downgradient of the landfill. These two wells are located at 39 and 41 Parkerville Road. To complete the risk assessment required by the MassDEP, Pare recommends sampling and analyzing the water from these two wells for 1,4-dioxane and arsenic. As of the date of this correspondence, the Town DPW Superintendent has reached out to both homeowners to ask if they would participate in this assessment. Both homeowners have responded and have agreed to participate in this assessment.

MassDEP requires a response to their letter within 14 days, a new round of groundwater monitoring within 30 days, and a completed assessment within 60 days. Pare will work with the Town to submit a response to MassDEP by January 21, 2026. The additional round of groundwater monitoring at the landfill is scheduled to be performed on January 15, 2026. If granted access to the houses at 39 and 41 Parkerville Road, Pare will perform the sampling of their drinking water wells. Pare expects to receive the analytical data back from the laboratory within 2 weeks of the sampling. Barring any unforeseen issues, a response and assessment will be sent to the MassDEP on or before March 8, 2026.

Please do not hesitate to contact Pare should you have any questions.

-TPT

Enclosures

Attachment 1 – 01/07/2026 Southborough Parkville Rd LF Exceedance Response Letter
Attachment 2 – Site Plan
Attachment 3 – 11/13/1996 CSA GW Contour Plan
Attachment 4 - 1, 4-Dioxane Graph

ATTACHMENT 1

01/07/2026 Southborough Parkerville Road LF
Exceedance Response Letter

Commonwealth of Massachusetts | Executive Office of Energy and Environmental Affairs

Department of Environmental Protection

Central Regional Office

Address: 8 New Bond St, Worcester, MA 01606 | **Phone**: 508-792-7650

Maura T. Healey	**Kim Driscoll**	**Rebecca Tepper**	**Bonnie Heiple**
Governor	Lieutenant Governor	Secretary	Commissioner

January 7, 2026

VIA ELECTRONIC MAIL
wcundiff@southboroughma.com

William Cundiff, DPW Superintendent
Town of Southborough
147 Cordaville Road
Southborough, MA 01772

Re: CERO – SWM – Parkerville Road Landfill, Southborough, Massachusetts, Reported Exceedance(s) of 310 CMR 19.132(h) Parameter(s)

Dear Mr. Cundiff:

The Massachusetts Department of Environmental Protection ("MassDEP") has reviewed the report titled, "Post-Closure Environmental Monitoring Results – Round 24, Parkerville Road Landfill, Southborough, Massachusetts," dated May 28, 2025 (the "Report"), which was received by MassDEP on January 7, 2026. MassDEP's preliminary review of the Report noted one or more water quality parameters in exceedance of applicable standards at the Landfill. The parameters and monitoring locations not in compliance with 310 CMR 19.132(h) are as follows:

1,4-Dioxane – Applicable Standard 0.3 ug/L

- Groundwater Monitoring Well MW-3S at 0.939 ug/L
- Groundwater Monitoring Well MW-3D at 0.598 ug/L

Arsenic – Applicable Standard: 0.01 mg/L

- Groundwater Monitoring Well MW-4S at 0.0176 mg/L.

The monitoring report states that the results are generally consistent with previous rounds; however, MassDEP requests additional information regarding the above-mentioned exceedances. Please provide MassDEP with the following information within 14 days of this letter:

1. Identify the current MCP groundwater category (GW-1, GW-2, GW-3) on the site and immediately downgradient of the site.
2. Indicate specifically whether the site and areas immediately down gradient of the site are located in a Current Drinking Water Source Area (Zone II, IWPA, Zone A,

within 500 feet of a private well) and/or a Potential Drinking Water Source Area (potentially productive aquifer, etc.).

3. Indicate the location of and the distance to the closest private drinking water wells to groundwater monitoring wells MW-3S, MW-3D, and MW-4S.
4. Provide conclusions indicating 1 of 2 things: 1) Potential Exposure issues have been evaluated and there is presently No Significant Risk associated with exceedance(s) OR 2) Notification that additional assessment work is warranted (including the specific details proposed).
5. Provide a figure showing the location and distance to all private and public drinking water wells within ½-mile from the limit of landfilled waste.

In addition, 310 CMR 19.132(2)(j) requires the Owner or Operator of a landfill to conduct an additional round of sampling within 60 days of the prior date of sample collection for all exceedances unless a waiver has been granted by MassDEP. As of the writing of this letter, MassDEP has not issued any waivers from the requirements of 310 CMR 19.132(2)(j) and therefore requests the Town of Southborough complete a resampling event within 30 days of the writing of this letter. The above requested information shall be submitted with the results of the resampling event, which should be submitted within 60 days of the date of sample collection in accordance with 310 CMR 19.132(2)(f).

If you have any further questions or comments regarding this matter, please contact me at 617-448-4204 or james.mcquade@mass.gov.

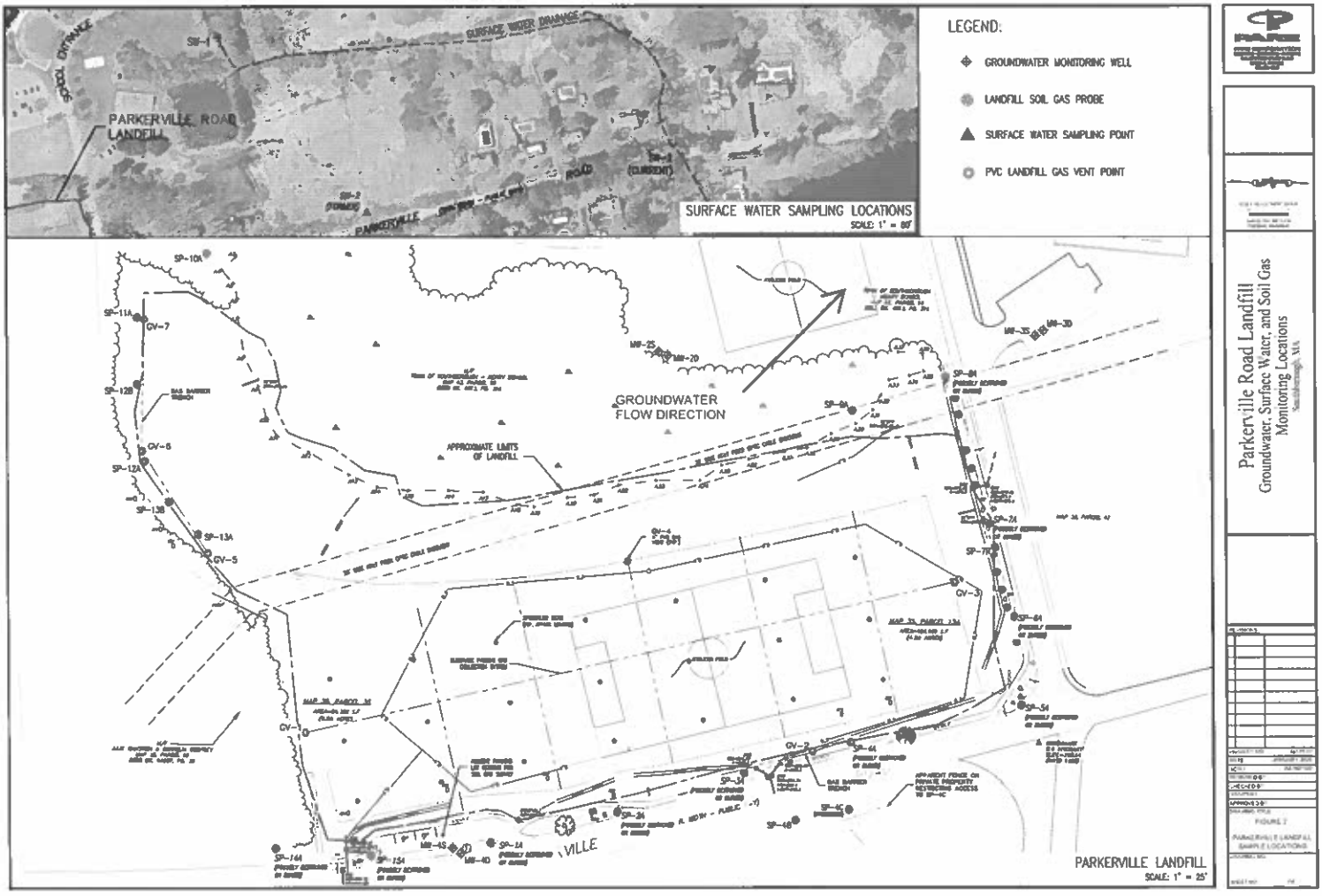
Sincerely,

James A. McQuade
Section Chief
Solid Waste Management Program

Ecc: Timothy P. Thies, P.E., Senior Vice President/Division Manager, Environmental Division, Pare Corporation, 8 Blackstone Valley Place, Lincoln, RI 02865, (tthies@parecorp.com)

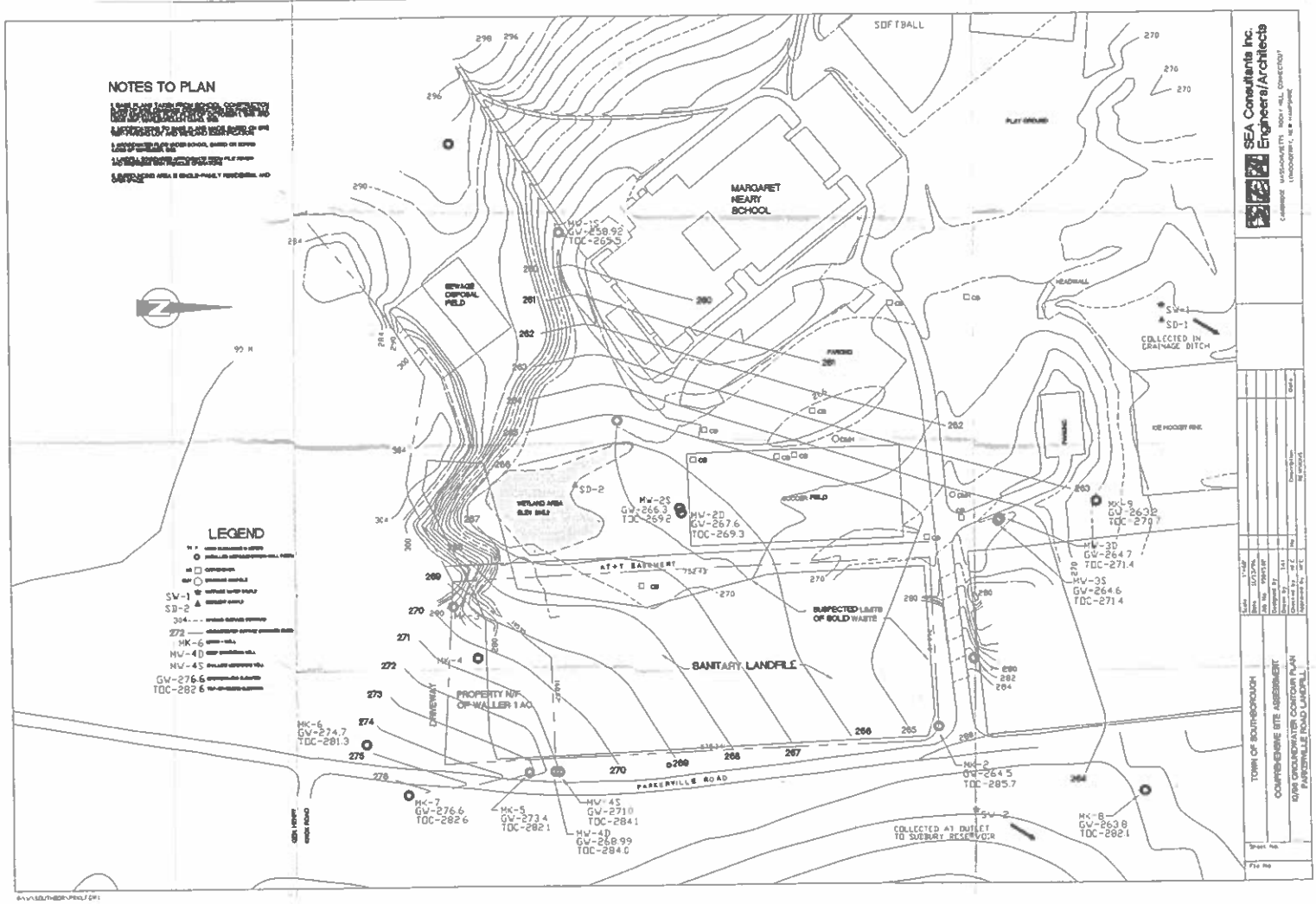
ATTACHMENT 2

Site Plan


SURFACE WATER DRAINAGE
SP-1
TOOL DISTANCE
PARKERVILLE ROAD LANDFILL
SP-2
STREAM
PARKERVILLE
ROAD
SP-3 (CURRENT)
SURFACE WATER SAMPLING LOCATIONS
SCALE: 1" = 80'
LEGEND:
GROUNDWATER MONITORING WELL
LANDFILL SOIL GAS PROBE
SURFACE WATER SAMPLING POINT
PVC LANDFILL GAS VENT POINT
GROUNDWATER FLOW DIRECTION
APPROXIMATE LIMITS OF LANDFILL
PARKERVILLE LANDFILL
SCALE: 1" = 25'
Parkerville Road Landfill
Groundwater, Surface Water, and Soil Gas Monitoring Locations

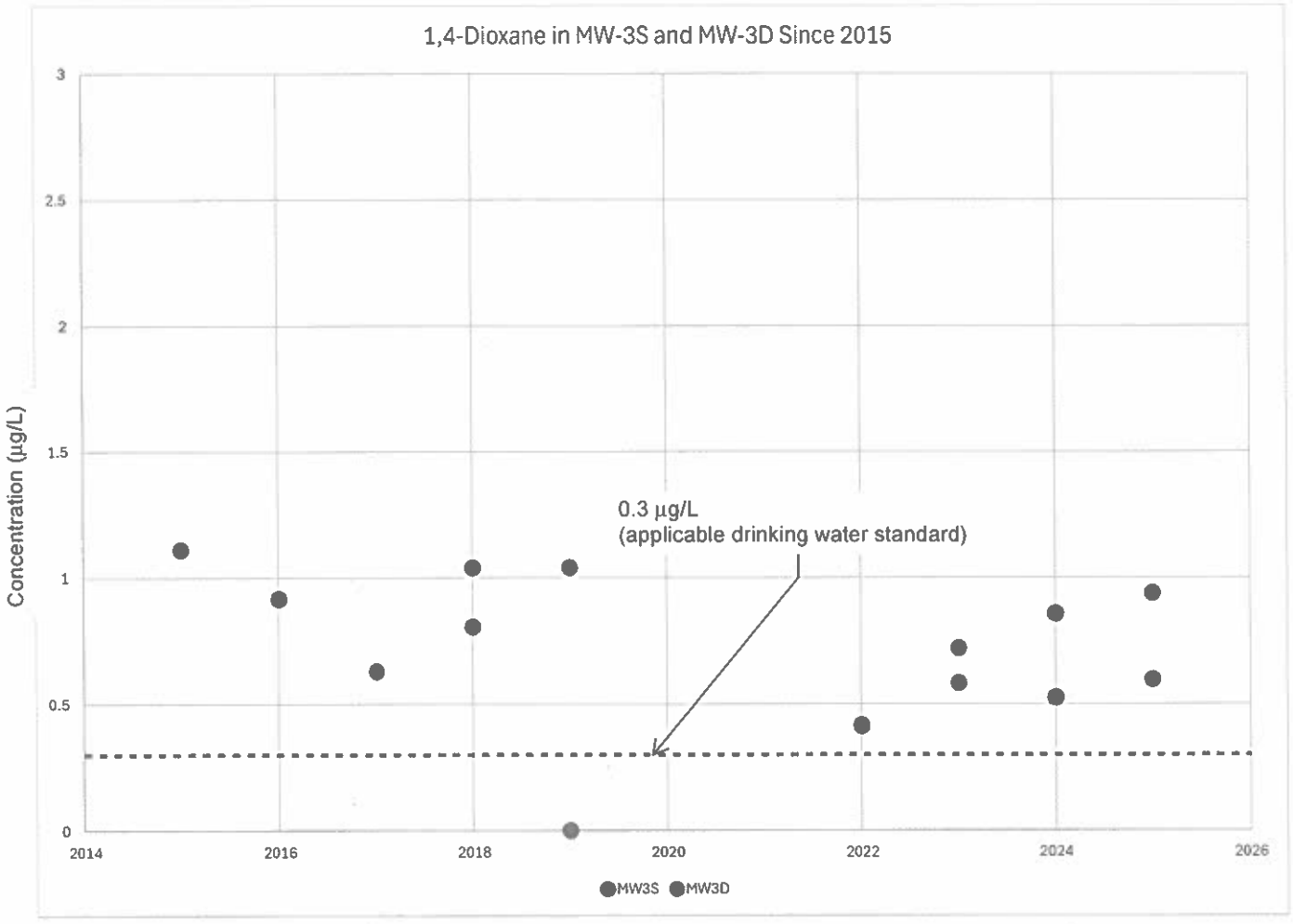
ATTACHMENT 3

11/13/1996 CSA GW Contour Plan


NOTES TO PLAN
LEGEND
SW-1
SD-2
MK-6
MW-4D
MW-4S
GW-276.6
TOC-282.6
SOFTBALL
MARGARET NEARY SCHOOL
SEWAGE DISPOSAL FIELD
PLAY GROUND
HEADWALL
COLLECTED IN DRAINAGE DITCH
ICE HOCKEY RINK
PARKING
SOCCER FIELD
WETLAND AREA SLEN SHLD
AT+T EASEMENT
SUSPECTED LIMITS OF SOLID WASTE
SANITARY LANDFILL
PROPERTY N/F OF WALLER 1 AC.
DRIVEWAY
PARKERVILLE ROAD
COLLECTED AT OUTLET TO SUDBURY RESERVOIR
MW-1S GW-258.92 TOC-263.5
MW-2S GW-266.3 TOC-269.2
MW-2D GW-267.6 TOC-269.3
MW-3D GW-264.7 TOC-271.4
MW-3S GW-264.6 TOC-271.4
MW-4 GW-274.7 TOC-281.3
MK-5 GW-273.4 TOC-282.1
MK-7 GW-276.6 TOC-282.6
MW-4S GW-271.0 TOC-284.1
MW-4D GW-268.99 TOC-284.0
MW-2 GW-264.5 TOC-285.7
GW-2
MK-8 GW-263.8 TOC-282.1
SEA Consultants Inc.
Engineers/Architects
TOWN OF SOUTHBOROUGH
COMPREHENSIVE SITE ASSESSMENT
10/98 GROUNDWATER CONTOUR PLAN
PARKERVILLE ROAD LANDFILL

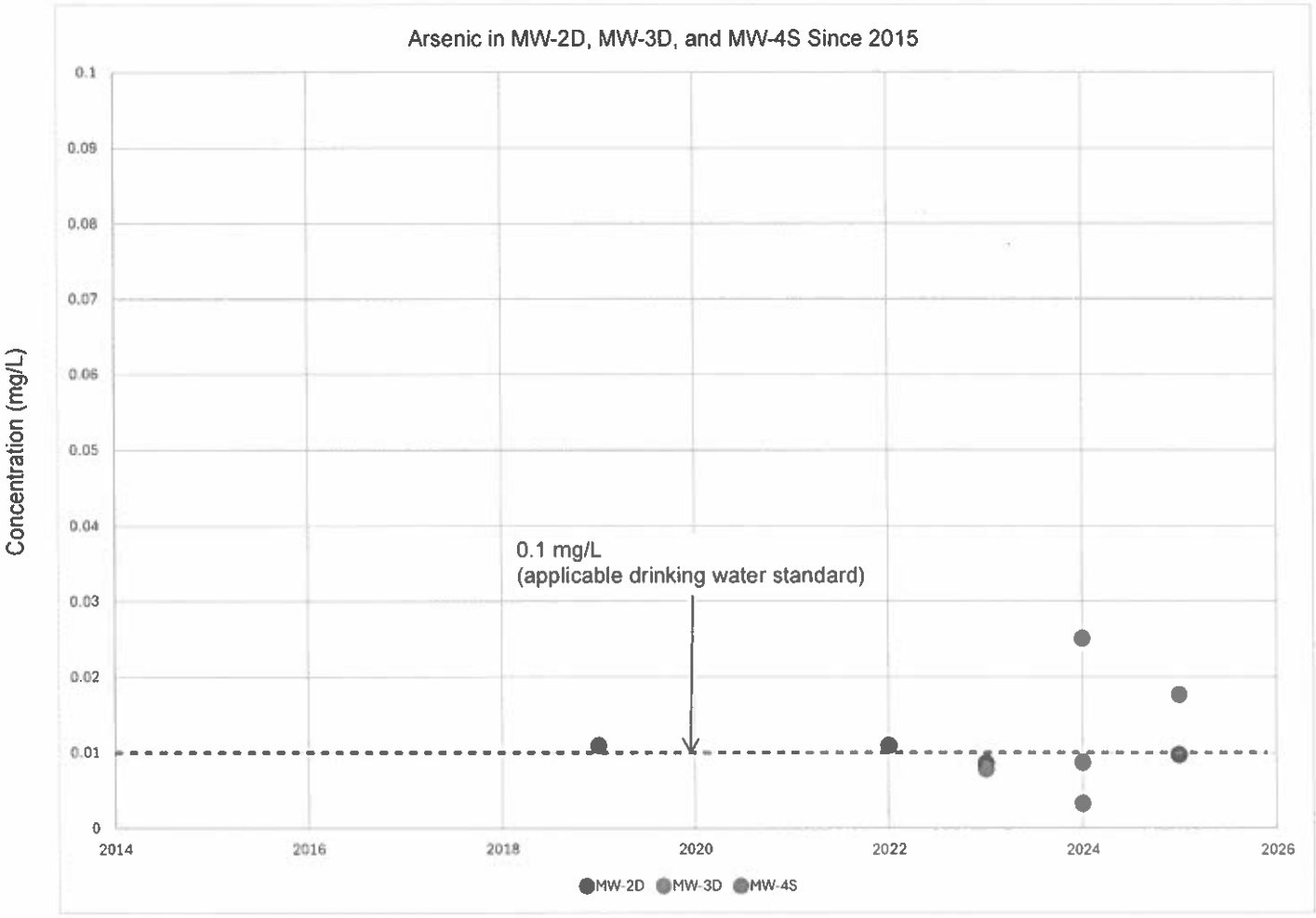
ATTACHMENT 4

1, 4-Dioxane Graph


1,4-Dioxane in MW-3S and MW-3D Since 2015
Concentration (µg/L)
3
2.5
2
1.5
1
0.5
0
2014
2016
2018
2020
2022
2024
2026
0.3 µg/L
(applicable drinking water standard)
MW3S
MW3D

ATTACHMENT 5

Arsenic Graph


Arsenic in MW-2D, MW-3D, and MW-4S Since 2015
Concentration (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0.1 mg/L
(applicable drinking water standard)
2014
2016
2018
2020
2022
2024
2026
MW-2D
MW-3D
MW-4S