

NJDEP Technical Guidance Document Review Form

Document: "*FSPM Chapter 9 - Soil Gas Surveys*"

Comment Period: *September 27, 2022 to November 9, 2022*

Chair person: *Crystal Pirozek*

Comment #	Page	Section	Subsection	COMMENTS	RESPONSE
1	3	9.1		Second to last sentence in the first paragraph needs to be reworded - grammar issues	agreed to change
2	3	9.1		Define vadose	added definition
3	3	9.1		It is unclear why the Introduction begins with a discussion on groundwater contamination. Consider starting (after minor rewording) with "Soil gas sampling is a screening tool..." Soil gas surveys can be used to assess both soil and groundwater characterizations.	agreed to change
4	3 and/or 13	9.1 and/or 9.5		Consider adding text noting that discussion of the selected soil gas survey technique(s), including design/rationale, methods, criteria, limitations, QC requirements, etc., is to be provided in the Project WP/QAPP with associated SOPs.	agreed to change, added to 9.5
5	4	9.2		Bullet 2 - dimensional is misspelled	agreed to change
6	5	9.3	2	The process described here is not decomposition but chemical reactions - Perhaps rename Chemical reactivity or reactions?	agreed to change
7	5	9.3	4.2	"Tourtiosity" misspelled. Should be "tortuosity" with lower case "t"	agreed to change
8	5	9.3	4.2	9.3.4.2 Second sentence Diffusive flow is in the direction of lower concentration not "in the direction concentration decreases"	agreed to change
9	5	9.3	4.2	Not sure there is a need to include the last two sentences regarding "Tortuosity" since document does not really say what it is - Could just say "Within soils, the diffusion coefficients are only relative indicators of soil gas transport".	agreed to change
10	6	9.3	4.3	As this is discussing a pressure gradient, need to state that these chemical reactions will result in increased pressure in the lower regions of the landfill. It is the increased pressure that drives the transport of the soil vapor.	the paragraph already states this information
11	6	9.4	1	Table 9.2 -- These are not compounds found in landfills but in the landfill gas. Also, the source for these numbers should be cited (for both Table 9.1 and 9.2)	changed names
12	6	9.4	1	Emerging contaminants such as PFAS and 1,4 Dioxane should also be included.	PFAs and 1,4 dioxane added
13	6	9.4	1	Temporal and spacial variations in concentration of contaminants in soil gas surveys should be discussed.	added text
14	7	9.4	1.2	Henry's Law constant need to be reformatted to show units properly and define units	agreed to change
15	7	9.4	1.2	Third paragraph states that the soil water partition coefficient is the process by which... The coefficient is not a "process" it is a ratio of the concentration sorbed on the soil to the equilibrium concentration in water.	changed text

16	8	9.4	1.3	The first sentence is problematic. Clarify to state that the vapor pressure is the pressure exerted by a vapor that is in equilibrium with its liquid phase and is a measure of the relative volatility of a contaminant.	agreed to change
17	8	9.4	1.4	Second sentence first paragraph. Missing the word "survey" after soil gas	agreed to change
18	9	9.4	1.4	First sentence on Page 9 mentions Fluorocarbons but then talks about chlorinated compounds. There is no mention of fluorine in the paragraph. Fluorocarbons is likely a typo?	removed sentence
19	9	9.4.1	1.4	Third to last sentence - The word "plume" is missing after ground water.	agreed to change
20	10	9.4	2.3	Last line "old" stream beds should be replaced with "buried former" stream bed.	agreed to change
21	11, 12	9.4		Figures 9.3 - Recommend revising to include clear/consistent labels -- for example - labelling the clay layer in 9.3B, impermeable later in 9.3C, etc. Reader had to sit and think about the figures for a few moments before I was interpreting them correctly.	agreed to change, images B and C were reversed
22	12	9.4	3.1	Recommend revising the last sentence to read "will have the greater effect of introducing VOCS into the vadose zone than...."	agreed to change
23	12	9.4	3.2	Second sentence needs to be reworded - clarity issue / not a complete understandable thought	agreed to change
24	13	9.4	3.3	First paragraph, consider changing to read: "can be a problem for soil gas sampling and therefore is not recommended."	agreed to change
25	13	9.4	3.3	Second paragraph - barometric can be lower case.	agreed to change
26	14	9.5	4	Figures 9.4 and 9.5 - recommend labeling features such as plume, sample point, etc.	agreed to change
27				General: Document uses both onsite and on-site, but only uses offsite. Consistency issue in the document	agreed to change
28	15	9.5	7	Second to last sentence -- Change to "it may demonstrate the variability" rather than "it will only indicate the variability"	agreed to change
29	18	9.6	2	Paragraph 3 - first use of direct push methods - but DP is defined with second use on page 19, 4th paragraph	agreed to change
30	18	9.6	2	Figure 9.9 - scxhedule 80 is not 1/8" but 1/4"	agreed to change
31	20	9.6	2	Figure 9.12 Features on the figure are not labeled	updated image, added labels
32	20	9.6	3	Materials of construction for PFAS sampling should also be discussed.	agreed to not discuss compound specifics, but general requirements instead
33	20	9.6	3	First sentence should specify "sampling materials" or "materials used for sampling"	agreed to change
34	20	9.6	3	QA/QC first use not defined	agreed to change
35	20	9.6	3	Last sentence -- replace revealed with "included"	agreed to change
36	21	9.6	4	"gage" is misspelled. Should be "gauge"	agreed to change
37	22	9.6	4	Second sentence - the word "tube" is missing after 1/4 inch	agreed to change
38	22	9.6	4	paragraph 2 line 4 - assuming can be lower case	agreed to change
39	22	9.6	4	paragraph 3 - PID, FID - first use and acronyms are not defined	agreed to change
40	22	9.6	6	First sentence - Remove measurements (says measurements can be measured)	agreed to change

41	23	9.6	6	Last paragraph. Falling barometric pressures do not increase the landfill gas pressures. The falling barometric pressure increases the convective transport due to the increased pressure differential. Please correct	agreed to change
42	24	9.7	1	Update Figure 9.15 . The AGI Sampler depicted is an older method that is focused on oil and gas exploration and is used on very few to no environmental surveys. Beacon's passive technology is the most frequently used passive method in New Jersey, across the United States, and globally. An updated figure is provided as an attachment that depicts installation in both open soils and through impervious surfacing.	exchanged picture
43	24	9.7	1.1	"1-foot" to be replaced by "one foot"	agreed to change
44	25	9.7	1	The section starts by defining AGI samplers as "formerly Gore-Sorber" and then goes back to referring to them as Gore-Sorbers. The section specifically states that Gore Sorbers are analyzed at Gore Labs but this is not the case for AGI Samplers? Please clarify	agreed to change
45	25	9.7	1.1	Paragraph 1 and 2 - both refer to Gore-Sorbers and Gore Laboratory after stating that the devices are now AGI samplers in earlier paragraphs	agreed to change
46	25	9.7	1.2	Are BEACON laboratory data accepted for other than screening? It is our understanding is the laboratory does not hold NJDEP certification and other laboratories do not analyze the sample collection devices.	agreed but decided to leave in the information
47	25	9.7	1.1	"hole the retrieval cord" should read " hole using the retrieval cord"	agreed to change
48	25	9.7	1.2	use acronym "GC/MS" previously defined	spelled out in each location for clarity
49	25	9.7	1.2	25 nanograms and 1 ng are not concentration units for RQL or MDL	sentence corrected
50	25	9.7	1.2	define MDL	spelled out
51	25	9.7	1.2	Correct the technology name to accurately reflect the name of the passive sampler. Title should read BEACON Soil Gas Sampler	agreed to change
52	25	9.7	1.2	Update the text to reflect the current capabilities of the technology with in the three paragraphs to read as follows:	agreed to change
53	25	9.7	1.2	The Beacon Soil Gas Sampler™ provided in BeSure Kits™ consists of two sets of hydrophobic adsorbent cartridges sealed in a 7ml screw top borosilicate glass vial that is pre-wrapped with a length of retrieval wire. The adsorbents used are chosen to concurrently target a broad range of compounds from the lighter VOCs (e.g., vinyl chloride) to the heavy SVOCs (e.g., PAHs), with the system calibrated to target over 100 compounds. Each cartridge contains the same measured amount of adsorbents, which are hydrophobic and not required to be wrapped in a membrane. The sampler is designed in compliance with ASTM Standard D7758.	agreed to change
54	25	9.7	1.2	To install a Beacon Sampler™, the solid shipping cap is removed and replaced with a sampling cap that allows for the free transfer of compounds onto the adsorbent. A small diameter hole is then advanced to a typical depth of 1 to 3 feet and the sampler is lowered into the upper portion of the hole, which is then sealed in the ground by plugging the hole with aluminum foil and collapsing the upper two inches of soil above this foil plug. For locations covered by asphalt or concrete surfacing, an approximately 1" diameter hole is drilled through the surfacing to the underlying soils, and the upper portion of the hole is sleeved with a sanitized metal pipe provided in the kit. After the sampler is installed inside the metal pipe, the hole is patched with an aluminum foil plug and a thin concrete patch to protect the sampler from surface runoff and ambient air. Following the exposure period, the samplers are retrieved and shipped under chain of custody to BEACON's laboratory for analysis. A minimum of one trip blank, which remains with the other samples during preparation, shipment, and storage, is included with the field samples. A two-person team can install approximately 50 to 100 samplers per day depending on the number of sample locations that are covered with asphalt or concrete. Sample exposure periods range from days to weeks depending on the sampling objectives and site conditions, with a typical exposure period being 7 or 14 days.	agreed to change

55	25	9.7	1.2	Analysis of the samplers is completed by BEACON using thermal desorption/gas chromatography/mass spectrometry (TD-GC/MS) instrumentation, following EPA Method 8260C or TO-17 procedures. Analytical results are based on an initial five-point calibration and internal standards and surrogates are included with each sample analysis. Data are reported in units of mass (nanograms) and/or concentration (ug/m3). With a 14 day sampling period, the laboratory's reporting limit for each of the targeted compounds is in the pptv range. Data are provided in tabular format as well as depicted on color isopleth maps showing the distribution of compounds identified.	agreed to change
56	26	9.7	1.4	replace "25-75 foot" with "25-75 feet"	agreed to change
57	27	9.8		Containers for PFAS sampling should also be discussed.	agreed to not discuss compound specifics, but only general requirements
58	29	9.9	2	Analytical instruments such as ppbRAEs measuring VOCs in ppb, etc. should also be discussed.	added reference to FSPM chapter 7 Direct Read information
59	29	9.9	2	use acronym "IR" insread of "infrared detector"	first use of acronym is spelled out
60	30	9.9	3	define ECD or reference in new section	spelled out
61	30	9.9	3	Heading - GC instead of G.C.	agreed to change
62	31	9.11		define K _{oc}	was previously defined
63	32	9.11		Second paragraph - replace "attack" with "biodegrade"	agreed to change
64	32	9.11		Second paragraph states that the longer the contamination is present, the higher the concentration of biogenic gasses, but this assumes that there is biodegradation happening. The absence of biogenic gasses may indicate that certain factors necessary for biodegradation are simply not in place at the Site. Please clarify or caveat this statement.	agreed to change
65	32	9.11		Last paragraph - instead of 'enormous differences' , this should be revised to 'significant differences'	agreed to change
66	32	9.11		use formulas for listed gases as in Section 9.9.2	Changed formulas to text
67	33	9.11		Line space needed between notes for equation and first sentence of paragraph	agreed to change
68				General - ppm, ppb, ppmV, ppbV, ug/L, mg/m3 not defined	agreed to change