Wood Environment & Infrastructure Solutions, Inc.
271 Mill Road, 3rd Floor
Chelmsford, MA 01824
USA

T: 978-692-9090

**www.woodplc.com**

July 19, 2019

Ms. Elizabeth Callahan
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Re: Written Comments
Amendments to 310 CMR 40.0000, Massachusetts Contingency Plan

Dear Ms. Callahan,

Wood Environment & Infrastructure Solutions, Inc. (Wood) is providing the following written comments to the proposed changes to the Massachusetts Contingency Plan (MCP), based on the draft released by the Massachusetts Department of Environmental Protection (MassDEP or the "Department") on April 19, 2019. Thank you for the opportunity to provide comments on these proposed changes. The below text contains the citation from the MCP and the draft MCP text if relevant, followed by the written comment and a suggested revision if provided.

**310 CMR 40.0974**

In the "Note to reviewers," MassDEP asked "How should the GW-1 standard consider Relative Source Contribution? The target Hazard Index used to develop the Method 1 Standards is 0.2 to account for multiple chemical- and multiple pathway- exposures at and from 21E sites. PFAS has been described as "ubiquitous" in the environment, including exposures from common household products and foods. Is the assumption that 20% of a person's exposure comes from drinking water sufficiently protective?"

**Comment:**

For PFAS, the exposure route of primary concern is ingestion; therefore, if one is referring specifically to exposure to PFAS, the question would be – to what extent does drinking water represent the proportion of PFAS ingested by a receptor? The major sources of ingestion would be anticipated to be food and water. If one assumes that a receptor consumes 2 liters of water per day at the proposed GW-1 standard of 20 ppt (20 ng/L), the consumption would be 40 ng/day from drinking water. For food, the best estimate of the PFAS contents of any foodstuffs is available in the ATSDR PFAS Toxicological Profile on page 588, which provides concentrations of PFOA in 31 food items, primarily protein and dairy with some starches, produce items, and oils/butter. If one uses the average of these PFOA concentrations (and ½ the DL for non-detects), the average PFOA concentration is 0.165 ng/g. Further, the weighted average per capita for total food consumption for ages 6 months to 70 years is 1,107.5 g/day (USEPA Exposure Factors Handbook, Table 14-3). If this is multiplied by 0.165 ng/g, the total PFAS (as PFOA) consumption per day from food is approximately 183 ng/day. The 40 ng/day from water expressed as a percentage of the total from water and food is 18 percent. As such, an assumption that 20 percent of PFAS exposure occurs from drinking water appears reasonable based on the information that is currently available. Therefore, no adjustment for relative source contribution would be warranted for the PFAS GW-1 standard.

**310 CMR 40.0924(8)**

(8) Indoor Air Exposure Points are locations within a building where exposure occurs or could occur. Indoor air Exposure Points:
 (a) shall be identified considering the nature, duration and likely frequency of exposure; and
  (b) areas of the building where exposure is likely to be different should be identified as distinct Exposure Points.

**310 CMR 40.0926(9)**

(9) Indoor Air Exposure Point Concentrations
 (a) A conservative estimate of the average concentration contacted by a receptor over the exposure period of concern, based on concentrations measured in indoor air, shall be used for the Exposure Point Concentration.
  1. Except where multiple rounds of data have been obtained in a manner that adequately establishes spatial and temporal variations, maximum concentration values shall be used as the Exposure Point Concentration for each contaminant of concern,
  2. When sufficient data are available to characterize the spatial and temporal variability at the Exposure Point, a maximum concentration value or 95 percent upper confidence limit on the mean shall be used to develop an Exposure Point Concentration.
 (b) A robust sub-slab soil vapor dataset and/or conditions may be used to:
  1. estimate or aid in the estimation of Exposure Point Concentrations in the event that it is not possible to distinguish disposal site-related contamination at the Exposure Point from interior sources at ongoing commercial and/or industrial operations or interior building materials contaminated by past commercial or industrial operations; or
  2. where appropriate, to rule out an indoor air Exposure Pathway.
 (c) Fate and transport models shall not be used to estimate future indoor air Exposure Point Concentrations in the indoor air of buildings that have not been constructed.

**Comment:**

While the current MCP is silent on the calculation of indoor air EPCs specifically, indoor air EPCs are addressed in the current Vapor Intrusion guidance. The guidance is similar to what is stated in the proposed sections 310 CMR 40.0924(8) and 40.0926(9), with the major difference that the guidance allows for the use of an arithmetic average to calculate EPCs and the proposed regulations do not.

It should first be noted that the specific requirement to use a 95 percent upper confidence limit (UCL) on the mean is dissimilar from what is stated for calculating soil EPCs, which allow for either a 90 percent Chebyshev UCL in any case or a 95 percent lognormal/gamma UCL. MassDEP's stated goal in specifying the 90 percent Chebyshev UCL was that this UCL is able to be calculated using Excel and is applicable to the distribution of any data set. This would be just as applicable to an indoor air data set as to a soil data set. Therefore, I would suggest that, at a minimum, 40.0926(9)(a)2 be changed to be consistent with the proposed 40.0926(8)(2)(a).

Regardless, the calculation of a UCL for an air data set in particular may be generally infeasible due to the typically small number of samples available. The general recommendation that is provided in the VI Guidance is to collect 2 to 4 rounds of indoor air data for a residence and 2 rounds for an industrial/commercial building. Per USEPA's ProUCL software, an error message is shown when data sets of 10 or fewer samples are analyzed to calculate a UCL that warns the user of the small data set size. (The size of these data sets is in stark contrast to soil data sets, which typically have larger numbers of samples that are sufficient for calculating a valid UCL.) This would be further compounded if any of the results are not detected, as only detected concentrations are used by the software to determine the distribution of the data set. As such, this may lead a practitioner to suggest, for example, the collection of 2 or 3 samples within each exposure point during a sampling round (rather than collecting, for example, 10 quarterly rounds of indoor air samples, which would suggest a period of 2.5 years to collect a sufficient number of samples to calculate an indoor air EPC). While in general the collection of more samples is a potential solution, it also substantially increases the analytical cost of the indoor air sampling, which is not insignificant.

While it is understandable that a conservative estimate of exposure be developed for an indoor air exposure pathway, the requirement to use a maximum detected concentration or a 95th percentile upper confidence limit (UCL) on the mean is also potentially overly conservative. The maximum would represent a point estimate of possibly a worst-case scenario for exposure that is intended to represent a 30-year full-time exposure duration. For example, if six rounds of data are available and a chemical was detected in only two of those rounds, it would not seem reasonable to conclude that the maximum detection is representative of year-round exposure (rather, the average of the detected concentrations and the reporting limits for non-detects could be appropriate.)  A UCL on the mean is more likely to better represent potential exposures; however, this could require data sets that are much larger than the indoor air data sets that are currently being used for vapor intrusion evaluations and risk characterizations.

In addition to the suggestion to modify the UCL recommendations, another option would be to modify the indoor air EPC section to more closely resemble the proposed soil EPC approach in 310 CMR 40.0926(8) and the groundwater EPC requirements in 40.0926(7)(a), which state [note that there are two 40.0926(7)(a) sections, and I am referring to the second]: A groundwater Exposure Point Concentration shall be a conservative estimate of the temporal mean for the exposure period of concern[,] and shall consider temporal trends.

It is the case that indoor air exposures represent a direct exposure, but so does a scenario where groundwater is evaluated as drinking water.

Please consider the following alternate language for this section of the MCP:

(9)  Indoor Air Exposure Point Concentrations

(a) A conservative estimate of the average concentration contacted by a receptor over the exposure period of concern, based on concentrations measured in indoor air, shall be used for the Exposure Point Concentration.

1.  Except where multiple rounds of data have been obtained in a manner that adequately establishes spatial and temporal variations, maximum concentration values shall be used as the Exposure Point Concentration for each contaminant of concern,

2. When sufficient data are available to characterize the spatial and temporal variability at the Exposure Point, an indoor air Exposure Point Concentration shall be:

a. a conservative estimate of the temporal mean for the exposure period of concern[,] and shall consider temporal trends.  In this case, a valid justification must be provided indicating that the sample mean is unlikely to substantially underestimate the true mean of the concentration of oil or hazardous material at the Exposure Point.  Such a demonstration should include, but need not be limited to, consideration of the observed distribution of the data, sampling strategy (including frequency, density, and potential biases), graphical representation of analytical results, and/or statistical analyses.  This conservative estimate of the mean may be represented by either:

i.  the arithmetic average of data from the Exposure Point, provided that the arithmetic average is less than or equal to the applicable risk-based concentration limit, 75% of the data points used in the averaging procedure are equal to or less than the applicable standard or risk-based concentration limit, and no data point used in the averaging is ten times greater than the risk-based concentration limit;

ii. a maximum concentration value,

iii. an upper confidence limit on the mean, as follows:

a.  The 90th percentile Chebyshev non-parametric upper confidence limit on the mean may be used in any case; or

b. The 95th percentile parametric upper confidence limit on the mean for a normal, lognormal, or gamma distribution may be used if a technical justification for the choice of upper confidence limit on the mean is provided.

**310 CMR 40.0926(8)(a)2.a.ii**

(8) Soil Exposure Point Concentrations for Chronic and Subchronic Direct Contact

(a) To calculate Exposure Point Concentrations for chronic and subchronic human direct contact exposures, other than for screening evaluations, discrete, composite or incremental sampling procedures may be used. The risk assessment documentation shall provide a technical justification for the choice of sampling procedure and sampling approach (i.e., systematic or judgmental sampling). The following requirements for determining soil Exposure Point Concentrations apply unless otherwise specified by the Department:

1. At disposal sites where the contamination originated from a discrete source and remains localized within an area less than 2,000 square feet, judgmental sampling of locations where OHM contamination most likely to

be present shall be acceptable. The arithmetic average of data from the Exposure Point is acceptable as an Exposure Point Concentration, provided:

a. the arithmetic average is less than or equal to the applicable standard or risk-based concentration limit, 75% of the data points used in the averaging procedure are equal to or less than the applicable standard or risk-based concentration limit, and no data point used in the averaging is ten times greater than the applicable standard or risk-based concentration limit; or

b. a valid justification is provided indicating that the sample mean is unlikely to substantially underestimate the true mean of the concentration of oil or hazardous material at the Exposure Point. Such a demonstration should include, but need not be limited to, consideration of the observed distribution of the data, sampling strategy (including frequency, density, and potential biases), graphical representation of analytical results, and/or statistical analyses.

2. For site conditions other than as provided at 310 CMR 40.0926(8)(a)1., one of the following two conditions must be met:

a. a systematic sampling approach shall be used to obtain a representative data set for the Exposure Point(s), and for accessible soils, the upper confidence limit on the mean shall be used with data from discrete or incremental sampling procedures to estimate Exposure Point Concentrations:

i. The 90th percentile Chebyshev non-parametric upper confidence limit on the mean may be used in any case;

ii. The 95th percentile parametric upper confidence limit on the mean for a lognormal or gamma distribution may be used if a technical justification for the choice of upper confidence limit on the mean is provided.

**Comment:**

Why is the normal distribution excluded from 310 CMR 40.0926(8)(a)2.a.ii? Based on the how ProUCL evaluates and calculates UCLs, there is no fundamental difference between the calculation of a normal UCL and a gamma or lognormal UCL.

Suggested revision:
ii. The 95th percentile parametric upper confidence limit on the mean for a **normal,** lognormal, or gamma distribution may be used if a technical justification for the choice of upper confidence limit on the mean is provided.

**310 CMR 40.0955(2)(b) and (c)**

(2) The characterization of the risk of harm to human health shall be conducted using Method 3, as described in 310 CMR 40.0993.

(a) The toxicity information used to characterize risk shall be consistent with the type and duration of exposure under evaluation, and shall be clearly identified and documented. Primary consideration shall be given to information developed by the Massachusetts Department of Environmental Protection for the purpose of conducting such risk assessments. Examples of such toxicity information include:

1. Reference Doses and Reference Concentrations; and
2. Carcinogenic Slope Factors and Unit Risk values.

(b) The conditions at the disposal site pose an Imminent Hazard based upon the potential for carcinogenic health effects if, for the oil and/or hazardous material evaluated and for each receptor, the estimated Excess Lifetime Cancer Risk is equal to or greater than a cancer risk limit which is an Excess Lifetime Cancer Risk equal to one-in-100,000.

(c) The conditions at the disposal site pose an Imminent Hazard based upon the potential for non-cancer health effects if, for the oil and/or hazardous material evaluated and for each receptor, the non-cancer risk calculated is equal to or greater than a non-cancer risk limit of:

1. a Hazard Index (or equivalent ratio of exposure) equal to one for oil or hazardous materials that have the potential to cause serious effects (including but not limited to lethal, developmental, or neurological effects) following short-term exposures, for example lead or cyanide; and
2. a Hazard Index equal to ten for all other oil or hazardous materials.

**Comment:**

Per the Note to Reviewers, the motivation behind this change is understood; however, I would note that it sets a precedent which is inconsistent with how the MCP has been used for more than 25 years, which is that calculated risks and hazards have been evaluated using one significant figure. As such, the cancer risk limit and the non-cancer hazard index limit in 40.0955(2)(c)1 would be more conservative than the risk limits that are applied for all other risk calculations in the MCP.

For example, using the current iteration of the Residential Soil Imminent Hazard Shortform, this change would mean that the lead concentration that would pose a potential imminent hazard would decrease from 315 mg/kg to 210 mg/kg, which is scarcely more than the Method 1 Standards that are intended to be protective of any exposure scenario and any soil depth. Does the Department wish to suggest that there are only two alternatives for lead in surface soil at a residence – acceptable or potentially immediately dangerous?

It should also be noted that in practice, 310 CMR 40.0955(2)(c) is used generally to apply to lead and cyanide and is not used for other chemicals. To make this section more effective, it would be better to list the exact OHM that should be considered rather than rely on MCP practitioners to make their own determinations as to what constitutes a "serious effect…following short-term exposures."

Another stated goal in their note to reviewers is the intent is to "eliminate the regulatory ambiguity created by the use of information with limited precision (1 significant figure)." However, this section (nor the MCP in general) does not state that risks should be evaluated using one significant figure, so in practice this is primarily a convention. As such, it may still be unclear to a practitioner what "equal to or greater than" means in the application of the revised sections 40.0955(2)(b) and (c). It appears that the Department *intends* to state that anything up to an HI of 0.99999 etc. or 9.9999 etc. would not be considered a potential Imminent Hazard. But, if a single significant figure is used, then in practice this would mean the limits would actually be 0.94999 etc. or 9.4999 etc.

To further clarify this section, I make the following suggestions:

1. 310 CMR 40.0955(2)(c)1 be amended to specifically reference the chemicals and routes of exposure that merit a comparison to the Hazard Index limit of 1.

2. The word "unrounded" be added to sections (b) and (c), as follows:

    (b) The conditions at the disposal site pose an Imminent Hazard based upon the potential for carcinogenic health effects if, for the oil and/or hazardous material evaluated and for each receptor, the **unrounded** estimated Excess Lifetime Cancer Risk is equal to or greater than a cancer risk limit which is an Excess Lifetime Cancer Risk equal to one-in-100,000.
    (c) The conditions at the disposal site pose an Imminent Hazard based upon the potential for non-cancer health effects if, for the oil and/or hazardous material evaluated and for each receptor, the **unrounded** non-cancer risk calculated is equal to or greater than a non-cancer risk limit of:
        1. an **unrounded** Hazard Index (or equivalent ratio of exposure) equal to one for oil or hazardous materials that have the potential to cause serious effects (including but not limited to lethal, developmental, or neurological effects) following short-term exposures, for example lead or cyanide; and
        2. an **unrounded** Hazard Index equal to ten for all other oil or hazardous materials.

**310 CMR 40.0993(6)**

(6) When identifying toxicity values for use in a Method 3 Risk Characterization, toxicity values developed by MassDEP shall be used.
(a) For perchlorate, a chronic and subchronic reference dose of 7E-5 mg/(kg-day).
(b) For methyl tert-butyl ether, a chronic RfD of 1E-1 mg/(kg-day).
(c) For methyl tert-butyl ether, a subchronic RfD of 1E0 mg/(kg-day).
(d) For tetrachloroethylene, an oral cancer slope factor of 2E-2 per mg/(kg-day). (e) For tetrachloroethylene, an inhalation unit risk of 3E-6 per ug/cubic meter.

(f) For the sum of the following per- and polyfluoroalkyl substances (PFAS), a chronic and subchronic reference dose of 5E-6 mg/kg/day:

1. Perfluorodecanoic acid (PFDA);
2. Perfluoroheptanoic acid (PFHpA);
3. Perfluorohexanesulfonic acid (PFHxS);
4. Perfluorononanoic acid (PFNA);
5. Perfluorooctanesulfonic acid (PFOS); and
6. Perfluorooctanoic acid (PFOA).

**Comment:**

It is understandable that MassDEP would like to instruct practitioners to preferentially use toxicity values that have been identified and developed by MassDEP. However, inserting the specific values themselves into the regulation could have unintended consequences that make this change inadvisable. The most significant risk is that new information is developed for one or more of these chemicals that leads to a re-evaluation of the toxicity and a corresponding change. In this case, updating any of the toxicity values listed in this section (or adding or deleting chemicals from this list) would require regulatory revision, which is a high barrier for a relatively minor change. In particular, the science of PFAS is still highly uncertain and likely to evolve such that the RfD listed in the proposed regulatory change and the chemicals to which it applies may even be out of date in the not too distant future.

The suggested revision to this section would be to revise (7) to be (6), and state that, “When identifying toxicity values for use in Method 3 Risk Characterization, the values should be selected in accordance with the hierarchy of sources listed below” etc. Then, MassDEP could publish the toxicity values that are listed in the proposed section (6) as a separate document, perhaps a risk assessment technical update, that could be updated or edited at any time. These would then qualify as “toxicity values adopted and otherwise published by MassDEP” and would be prioritized over toxicity values from other sources.

**General Comment:**

There are multiple references to 310 CMR 40.0993(6) in the MCP. Pursuant to the above changes to 40.0993, these references should be updated to 310 CMR 40.0993(10) (based on the current draft, or, if changes are made, to whichever number refers to the cumulative risk limits for section 40.0993 in the final draft).

Thank you for your consideration of these comments.

Sincerely,
Wood Environment & Infrastructure Solutions, Inc.

Jane A Parkin Kullmann

Jane A. Parkin Kullmann, CPH
Senior Risk Assessor

Wood Environment & Infrastructure Solutions, Inc.
271 Mill Road, 3rd Floor
Chelmsford, MA 01824
USA

T: 978-692-9090

**www.woodplc.com**

July 18, 2019

Ms. Elizabeth Callahan
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Re: Written Comments
Amendments to 310 CMR 40.0000, Massachusetts Contingency Plan
Manufactured Gas Plant Waste

Dear Ms. Callahan,

Wood Environment & Infrastructure Solutions, Inc. (Wood) is providing the following written comments on proposed amendments to the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000) that pertain to Manufactured Gas Plant Waste. A summary of the proposed revisions is provided below, followed by our comments.

## SUMMARY OF PROPOSED REVISIONS RELATED TO MANUFACTURED GAS PLANT WASTE

1. The definition of Hot Spot (310 CMR 40.0006) was revised to include the following: "*In all cases, areas of waste disposal, including but not limited to Manufactured Gas Plant Waste, shall be considered hot spots*." Furthermore, as specified at 310 CMR 40.0926(12), "*Where a Hot Spot is comprised in whole or in part of waste material, including Manufactured Gas Plant Waste, the concentrations of oil and/or hazardous material within the waste shall be considered the concentration of the OHM in soil.*" Also, at 310 CMR 40.0996(2), concentrations of oil and/or hazardous material (OHM) detected "*within waste material, including Manufactured Gas Plant Waste, itself*" shall be compared to Upper Concentration Limits (UCLs) in Soil.

2. Manufactured Gas Plant Waste has been added to the definitions at 310 CMR 40.0006 as follows: "*Manufactured Gas Plant Waste and MGP Waste means tars, oil, coke, and other by-products formed in the coal gasification process.*"

3. MGP Waste has also been added to the definition of Readily Apparent Harm (RAH) at 310 CMR 40.0995(3)(b)(1): "*The following conditions shall represent "readily apparent harm": …c. Visible presence of oil, tar, Manufactured Gas Plant Waste, or other non-aqueous phase hazardous material in soil within three feet of the ground surface over an area equal to or greater than two acres, or over an area equal to or greater than 1,000 square feet in sediment within one foot of the sediment surface.*"

## COMMENTS ON THE PROPOSED REVISIONS

- **Except for waste material that is present in the environment as a pure waste, the existing regulations are sufficient to ensure that MGP waste is appropriately remediated.**
    - Waste (such as liquid tar or oil) which is sufficiently fluid to invade surrounding porous media is by definition Non-Aqueous Phase Liquid (NAPL). For MGP waste present as a NAPL that has invaded soil pores or fractures in bedrock, the remedial objective for a Permanent Solution (per 310 CMR 40.1003(7) is currently to address "all Non-stable NAPL" and to remove "all NAPL with Micro-scale Mobility if and to the extent feasible based upon consideration of CSM principles." If the performance standard has been met for removing all Non-stable NAPL and removing NAPL with Micro-scale Mobility to the extent feasible, then it should not be necessary to compare remaining concentrations of NAPL in soil to Soil UCLs.

  - For waste that is contained within tanks, holders, piping or other structures and has not yet reached the environment, the comparison of OHM concentrations in the waste to Soil UCLs also seems inappropriate. The need for remediation should be based on other criteria, such as whether the waste poses a threat of release per 310 CMR 40.0312, or whether the waste represents a source of contamination that requires elimination or control per 310 CMR 40.1003(5).
  - The proposed MCP revised text "*Where a Hot Spot is comprised in whole or in part of waste material, including Manufactured Gas Plant Waste, the concentrations of oil and/or hazardous material within the waste shall be considered the concentration of the OHM in soil*" is confusing. In cases where waste material is mixed with soil, the concentrations of OHM in the soil mixture, not in the waste material itself, should be considered the concentration of OHM in soil. Waste material mixed with soil or incorporated into soil is already regulated by the MCP and the standard of care is to sample and analyze the mixture as contaminated soil and follow MCP requirements for soil.

- **It may be appropriate to compare OHM concentrations in pure waste to UCLs in evaluating whether the material poses a risk to public welfare. However, defining the waste as a hot spot and comparing the waste concentrations to Soil UCLs are problematic for the risk characterization process. Instead, separate UCLs should be developed for waste material.**

  - The MCP definition of "Hot Spot" makes no reference to any specific environmental medium (soil, groundwater, surface water, sediment, etc.). In the Risk Characterization section of the MCP, section 310 CMR 40.0924 (4) states that "Hot Spots shall be considered distinct Exposure Points." The designation of Hot Spots as distinct Exposure Points indicates that risks to health, safety, public welfare, and environment at Hot Spots must be characterized. However, the MCP does not include a procedure for evaluating risk to health associated with potential exposure to "waste material" nor "areas of waste disposal."
  - Under the proposed revisions, any "disposal area" (hardened tar at 5 to 10 feet below ground surface [bgs], for example) would be defined as a Hot Spot. Concentrations of OHM in the "waste material" would be considered the "soil concentrations." In a Method 1 risk characterization, an exposure point concentration (EPC) for OHM in the waste material (the hot spot) would be compared to Method 1 soil standards, although receptors would not be exposed to waste material with the same frequency and intensity as exposure to soil. Therefore, treating them as soil for the evaluation of human health risk is inappropriate.
  - In a Method 3 risk characterization, the exposure assessment for the Hot Spot would be a substantial challenge. Determination of ingestion rates, dermal contact surface areas, dermal absorption rates for potential exposure to hardened tar would be difficult at best. In addition, identifying frequency of exposure for hardened tar would also be very difficult. Unlike soil that is generally accessible to receptors of all ages, it is probable that people would be less likely to be in direct contact with the waste material than they would for soil. The hardened tar is clearly visible, and it does not provide the same opportunity for contact (dermal contact, incidental ingestion, and inhalation of wind-derived dust). Consistent with the MCP at 310 CMR 40.0923 (3) (b), certain activities and uses that might otherwise be reasonably foreseeable can be eliminated from further consideration through an Activity and Use Limitation (AUL). For example, excavation within the footprint of the Hot Spot might be prohibited to prevent future exposure to the waste material located at depth (5 to 10 feet bgs). This is a reasonable approach for protecting health and the environment, if OHM concentrations do not exceed UCLs (or OHM concentrations have been immobilized or treated by fixation) and the waste material does not pose a risk to public welfare.
  - Based on the above considerations, it would be more straightforward to require that OHM concentrations in waste material be compared to UCLs developed specifically for waste material. Designation of waste material as a hot spot would require that EPCs of OHM in the waste material be evaluated in a human health risk characterization, which does not appear to be necessary.

- **The inclusion of MGP waste in the definition of RAH does not appear to be technically justified.** Without the proposed revision, tars and oils are already included in the definition of RAH. It is not clear how MassDEP can assert readily apparent harm to ecological receptors based on visible evidence of coke or oxide box waste. Is the proposed regulation change based on documented toxicological impacts of coke or oxide box waste on terrestrial and benthic organisms? Or is the presence of visible coke or visible oxide box over a 2-acre terrestrial area or 1,000 square feet of sediments assumed, as a matter of policy, to represent an obvious threat to the environment?

It seems that the requirements for a Permanent Solution that were promulgated with MCP revisions in 2014 (relative to source elimination or control, migration control, and NAPL) should be sufficient to ensure that MGP wastes are being adequately remediated. What is the impetus for the regulatory revisions currently proposed for MGP wastes? Have MGP wastes been left in place at sites without appropriate controls? If so, would it be better to address these sites on an individual basis rather than to promulgate additional regulatory changes?

Thank you for the opportunity to provide these comments.

Sincerely,
Wood Environment & Infrastructure Solutions, Inc.

Kim M Henry

Kim M. Henry, LSP
Principal Program Manager

M J Murphy

Michael J. Murphy
Principal Risk Assessor

Russell A. Johnson, LEP
Principal Program Manager