Appendix C. States Survey: Printed from Interstate Technology & Regulatory Council (ITRC). 2018. TPH Risk Evaluation at Petroleum-Contaminated Sites. THPRisk-1. Washington, D.C.: Interstate Technology & Regulatory Council, TPH Risk Evaluation Team. https://tphrisk-1.itrcweb.org

Appendix C. States Survey

ITRC TPH States Survey Results

Current State of Cleanup Levels and Approaches for Petroleum-Contaminated Sites

Introduction

A States Survey was conducted by the Interstate Technology and Regulatory Council (ITRC) TPH Risk Evaluation at Petroleum-Contaminated Sites Team. A total of 53 complete responses were recorded from 44 states (a few with multiple programs), Washington, D.C., and Puerto Rico.

Risk evaluations for petroleum release sites present complex and unique challenges to site managers, risk assessors, regulators, and other stakeholders. Risk characterization based on TPH concentration measurements in different environmental media may be used for risk-based corrective actions at petroleum release sites. However, chemical compositions of petroleum hydrocarbon mixtures are complex and subject to change over time due to fate and transport processes. Although methods to characterize risk for individual constituents of TPH are well accepted, methods to assess cumulative risk posed by the multitude of petroleum-related compounds typically included under the term “TPH” have yet to be widely accepted and employed. This is compounded by inconsistencies between published guidance for the risk-based assessment of TPH-related compounds and requirements for expensive laboratory tests that might not be available in many areas of the country. Better guidance is needed to help states develop consistent methodology for establishing risk-based cleanup levels and for establishing and approving methods for risk-based evaluation and corrective action.

The goal of the survey was to collect information from state agencies on the use of TPH data within their regulatory programs and to help develop the ITRC technical and regulatory (Tech Reg) guidance that describes best practices for evaluating TPH risk. A total of 31 questions under five categories were included in the survey and the responses are included in this appendix (Question 1 of the survey was the respondent’s information and is not included in this appendix; summary of responses to Questions 2 through 31 of the survey are included). A summary of the survey results is presented in Table C-1. The document depository for this report contains more details about survey responses.

Table C-1: Summary of States Survey responses

Description	No. of Responses	States
Total number of responses recorded	60	Most states, including Puerto Rico
Number of complete responses	54	Most states, including Puerto Rico
Number of states with multiple programs	11	Arizona, California,[1] Colorado, Maryland, Michigan, Mississippi, Nebraska, Texas, Utah, Washington, and Wyoming
Number of incomplete responses	6	Maryland (2 programs), Michigan, New Mexico, Washington (1 program), and West Virginia
Number of states with no data (incomplete or survey not taken)	7	Idaho, Maryland, New Mexico, New York, Pennsylvania, South Dakota, and West Virginia
[1]California responses from multiple programs were later harmonized.		

Regulation and Policy

Question 2: Are you aware of sites with analytical results below screening levels/cleanup levels/standards that have exhibited problematic or nuisance conditions relating to petroleum impacts (e.g., odor, flammable vapors, aesthetics) and how often does this occur?

Response Summary for Q2: Almost two-thirds of respondents reported encountering otherwise compliant sites with nuisance conditions. A smaller number, about 1 in 10, encounter this situation regularly. Use of TPH standards did not appear to strongly influence whether or not this type of problem was reported.

Question 3: Are there different closure parameters/protocols/levels for different programs (e.g., exploration & production (E&P) sites, underground storage tank (UST) sites, voluntary remediation, brownfields, AST, pipeline, etc.)?

Response Summary (Figure Q3) see Response Summary Table: About half of respondents indicated that standards and protocols differed between programs; most of these indicated differences between UST/petroleum and voluntary cleanup programs, and several noted different standards or protocols addressing E&P sites.

Figure Q3.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 4: Are the contaminant-specific screening levels/cleanup levels/standards used by your program based on levels published by another agency, e.g., EPA's Regional Screening Levels, etc.?

Response Summary (Figure Q4) see Response Summary Table: Most respondents use state-determined screening levels/cleanup levels/standards. Most of the remainder use either EPA RSLs without modification or combined state levels and RSLs or modified RSLs.

Figure Q4.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 5: Why does your state or program NOT USE fractionated hydrocarbon analysis for environmental investigation/remediation of TPH? Please select all that apply.

Response Summary (Figure Q5) see Response Summary Table: Slightly less than a third of respondents indicated they currently used fractionated hydrocarbons in some capacity. Another third of respondents felt that total TPH standards are adequate, and the last third stated that indicator compounds are sufficient for assessing risk. Only a small number of respondents expressed concern for the cost of fractionated analysis.

Figure Q5.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 6: Are the vertical screening distances recommended by ITRC and U.S. EPA implemented/accepted by your program for PVI screening?

Response Summary (Figure Q6): ITRC vertical screening distances for PVI are accepted by about a third of respondents with a slightly lesser fraction considering them for future use.

Figure Q6.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 7: Does your state have specific guidance with regards to the discharge of TPH-impacted groundwater to surface water?

Response Summary (see Response Summary Table): Half of respondents have no guidance on discharge to surface water. Most of those respondents indicating there was guidance referenced the use of surface water or specific discharge to surface water screening levels.

Question 8: Recognizing regulators often have the ability to approve low-threat closures that leave residual TPH in soil and/or groundwater, in your state, is there a policy or statute under which a discharger/responsible party has the right to leave any amount of residual TPH in soil and/or groundwater (meaning, the state regulator has little or no input on the final decision)?

Response Summary: Most states indicated that regulatory review was required prior to leaving low-risk TPH behind. Those that indicated there was a right to leave low risk TPH behind largely specified in their comments that some regulatory approval or permit was still required to do this.

Question 9: Does your state implement a Natural Resource Damage Assessment or Natural Resource Injury Assessment for the contamination of groundwater or for the contamination of surface water sediments from a groundwater discharge to surface water?

Response Summary (Figure Q9): Over half of respondents do not implement Natural Resource Damage Assessments for the contamination of groundwater or for the contamination of surface water sediments from a groundwater discharge to surface water.

Figure Q9.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Field Screening, Sample Collection, and Analytical Methods

Question 10: Does your program have a specific protocol or field methods to require odor, visual, or other field methods for characterizing TPH impacts? Select all that apply and provide any thresholds (quantitative or qualitative) associated with the method.

Response Summary (Figure Q10) see Response Summary Table: About half of respondents indicated they had protocols for using visual, odor, or photoionization detector (PID) readings to evaluate petroleum impacts. Respondents who did not have specific protocols also cited these methods as commonly used. Only a handful of respondents indicated they had protocols for the use of dye or immunoassay tests for TPH and other field methods as suggested in Appendix C.

Figure Q10.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Screening, Cleanup, or Closure Levels/Standards

Question 11: Which analytical parameters does your state or program use for regulatory compliance or evaluating soil or groundwater contaminated with TPH products? (Please check all that apply).

Response Summary see Response Summary Table: A wide variety of analytical parameters are required by states in various combinations. Most respondents require GRO, BTEX, and additives for gasoline, and DRO, BTEX, and some combination of SVOCs for diesel, waste oil, and crude oil.

Question 12: How are measurements of screening levels, cleanup levels, or standards of total or fractionated hydrocarbons used within your program (select all that apply).

Response Summary (Figure Q12) see Response Summary Table: Most respondents used TPH for both screening levels and cleanup levels while a slightly lesser number also use TPH as an indicator of LNAPL presence. In order of decreasing frequency, TPH was cited as used for contaminant mass estimation, natural source zone depletion, and LNAPL mobility.

Figure Q12.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Ecological Risk Evaluation

Question 13: Does your state have requirements/guidance on performing aquatic community surveys/monitoring, terrestrial wildlife species assessments, tissue sampling, bioassays, or habitat assessments following an oil spill/cleanup?

Response Summary (Figure Q13) see Response Summary Table: Respondents were evenly split between those that did and did not have specific guidance on measuring ecological impacts of a release.

Figure Q13.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 14: Does your state require remediation of TPH contamination based only on ecological risk, if human health risks are not a concern?

Response Summary (Figure Q15) see Response Summary Table: A little less than two-thirds of respondents indicated that remediation was required by their state to address ecological risk.

Figure Q14.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 15: With respect to TPH, does your specific program follow a publicly available, written guidance for conducting an ecological risk assessment?

Response Summary (Figure Q15) see Response Summary Table: Half of respondents indicated their program had guidance on ecological risk assessment.

Figure Q15.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 16: What approach does the state or program follow for addressing ecological impacts of TPH?

Response Summary (Figure Q16) see Response Summary Table: About half of respondents indicated they used a tiered approach to address ecological impacts of TPH, with most of the remainder not having specific guidance. A baseline risk approach was indicated by a half dozen respondents.

Figure Q16.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

General

Question 17: Does your program utilize screening and/or cleanup/closure levels for TPH contamination in any media?

Response Summary (Figure Q17): Less than a third of respondents did not use TPH at all, a third used both fractionated and unfractionated TPH, and another third using only unfractionated TPH. A smaller number—about a half-dozen respondents—use only fractionated hydrocarbons.

Figure Q17.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Fractionated TPH-Specific Questions

Question 18: Why is your program using fractionated screening levels/cleanup levels/standards? (select all that apply)

Response Summary (Figure Q18): Of those who use fractionated TPH, the majority indicated that fractionated standards were adopted to improve risk assessment or develop more robust screening levels. A half dozen respondents indicated that fractionated standards were chosen to replace prior unfractionated standards.

Figure Q18.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 19: Are you aware of previously closed cases that were reopened due to the use of closure levels that were based on fractionated standards?

Response Summary for Q19: Respondents were not aware of any closed case that had been reopened due to the use of fractionated TPH standards.

Question 20: If your state program also utilizes unfractionated TPH data (e.g., TPH GRO, TPH DRO) for TPH contamination in any media, click “Continue to unfractionated TPH questions.” Otherwise click “Continue to Final Thoughts.”

Response Summary for Q20: Most respondents who use fractionated hydrocarbons also used unfractionated hydrocarbons in some capacity.

Unfractionated TPH–Specific Questions

Question 21: How are sites with TPH above screening levels/cleanup levels/standards but no other individual chemicals above screening levels/cleanup levels/standards typically addressed? (select all that apply using 1–5 to show order of importance, 1–most important and 5–least important).

Response Summary (Figure Q21): Active remediation was identified as by far the preferred option for addressing TPH when no indicator compounds are present. The second option was pathway elimination, closely followed by use of additional analytical data and numerical risk assessment.

Figure Q21.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 22: Does your program consider TPH degradation products (e.g., polar compounds) as part of its risk evaluation?

Response Summary (Figure Q22): Half of respondents do not evaluate for TPH degradation products. The eight respondents who do consider polar compounds indicated they are considered at certain sites on a site-specific basis to determine breakdown rate, evaluate new versus older spill, or evaluate intermediate and unrefined products.

Figure Q22.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 23: What analytical methods or combination of methods are required by your program for TPH? Select all that apply.

Response Summary (Figure Q23) see Response Summary Table): Half of the respondents reported requiring use of EPA Method 8015B. Other methods also mentioned by about a half-dozen respondents are MADEP-EPH-04, TX 1005, and TX 1006. Other methods mentioned by a few states included TO-15 and TO-17, EPA 8260 and 8270, or state methods for GRO/DRO/RRO.

Figure Q23.

(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 24: Does your program allow for comparison of TPH data collected using different analytical methods, e.g., to facilitate comparison of historical data with more current data (e.g., DRO vs. EPH)?

Response Summary (Figure Q24) see Response Summary Table: The programs of more than a third of respondents do not allow comparison of TPH data collected using different analytical methods or comparison of historical data with more current data. Almost a third of respondents allow these types of comparisons, often on a site-specific basis.

Figure Q24.

(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 25: Does your agency allow silica gel cleanup (SGC) when analyzing TPH?

Response Summary (Figure Q25): Respondents were evenly split between allowing and not allowing SGC. A quarter of the total allow the use of SGC along with non-SGC data. A number who identified SGC as allowed indicated that it was only to be used for removing naturally occurring polar compounds, not petroleum degradation products. Two states require SGC. More than half of states that use unfractionated TPH do not allow SGC.

Figure Q25.

(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 26: What is the basis of your state's screening levels/cleanup levels/standards? Select all that apply.

Response Summary for Q26: Half of the respondents indicated that their screening levels/cleanup levels/standards are risk-based values. A few also mentioned background and/or taste/odor as the basis.

Only four respondents use EPA screening levels. Other considerations mentioned include soil saturation, groundwater saturation, and policy-based limits.

Question 27: For which media does your state screen or evaluate TPH levels? Select all that apply.

Response Summary (Figure Q27) see Response Summary Table: Soil and groundwater are evaluated for TPH by more than half of respondents. Many also evaluate gas/vapor or air (ambient and indoor), with a lesser number evaluating TPH in air. A few noted other media such as surface water and sediments.

Figure Q27.

(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 28: Are site-specific cleanup screening levels/cleanup levels/standards allowed for TPH?

Response Summary (Figure Q28): Only a third of respondents would allow site-specific levels for TPH or TPH fractions.

Figure Q28.

(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Question 29: Check all applicable environmental concerns considered in development of state risk-based Air/Soil Vapor screening levels for carbon range fractions and/or TPH.

Response Summary see Response Summary Table: Most respondents who developed risk-based levels consider inhalation

toxicity, with a lesser number considering groundwater partitioning or nuisance issues.

Question 30: Check all applicable environmental concerns considered in development of state risk-based Soil/Sediments screening levels for carbon range fractions and/or TPH.

Response Summary see Response Summary Table: Direct exposure and leaching were almost always considered in developing TPH soil standards while vapor intrusion, aesthetic, or ecological issues were considered less often.

Question 31: Check all applicable environmental concerns considered in development of state risk-based groundwater/surface water screening levels for carbon range fractions and/or TPH.

Response Summary (Figure Q31) see Response Summary Table: The top environmental concern considered when developing state risk-based screening levels for carbon range fractions and/or TPH was direct exposure (e.g., drinking water ingestion). About a third of respondents cited vapor intrusion, aquatic toxicity, and gross contamination as concerns of equal importance.

Figure Q31.
(Source: M. Pattanayek (ITRC Industry Affiliate, 2018))

Final Thoughts

Question 32: Do you have any other thoughts regarding your state or program's current use, or choice not to use screening levels/cleanup levels/standards levels for TPH? For example, are there sites/circumstances where the use of screening levels/cleanup levels/standards for petroleum hydrocarbons would have been helpful, or conversely where it may unnecessarily hindered site closure? Please describe.

Response Summary for Q32: A third of respondents provided additional comments with most describing how their programs use, or why they do not use, TPH. Several expressed an interest in new science and national guidance regarding TPH and petroleum metabolites while a similar number felt that only indicator compounds should be evaluated or that TPH should only be used for screening purposes.

States Survey Supporting Tables