CONCENTRATIONS AND CHARACTER OF PAH IN SEDIMENTS IN THE PROPOSED REMEDIAL ALTERNATIVES AREA OF THE PORTLAND HARBOR SUPERFUND SITE, RIVER MILES 5 – 6 2015 INVESTIGATION

MARCH 29, 2016

Prepared for:

ExxonMobil

Prepared by:

Allen D. Uhler, Ph.D. and Kerylynn Krahforst

NewFields
Perspective. Vision. Solutions.

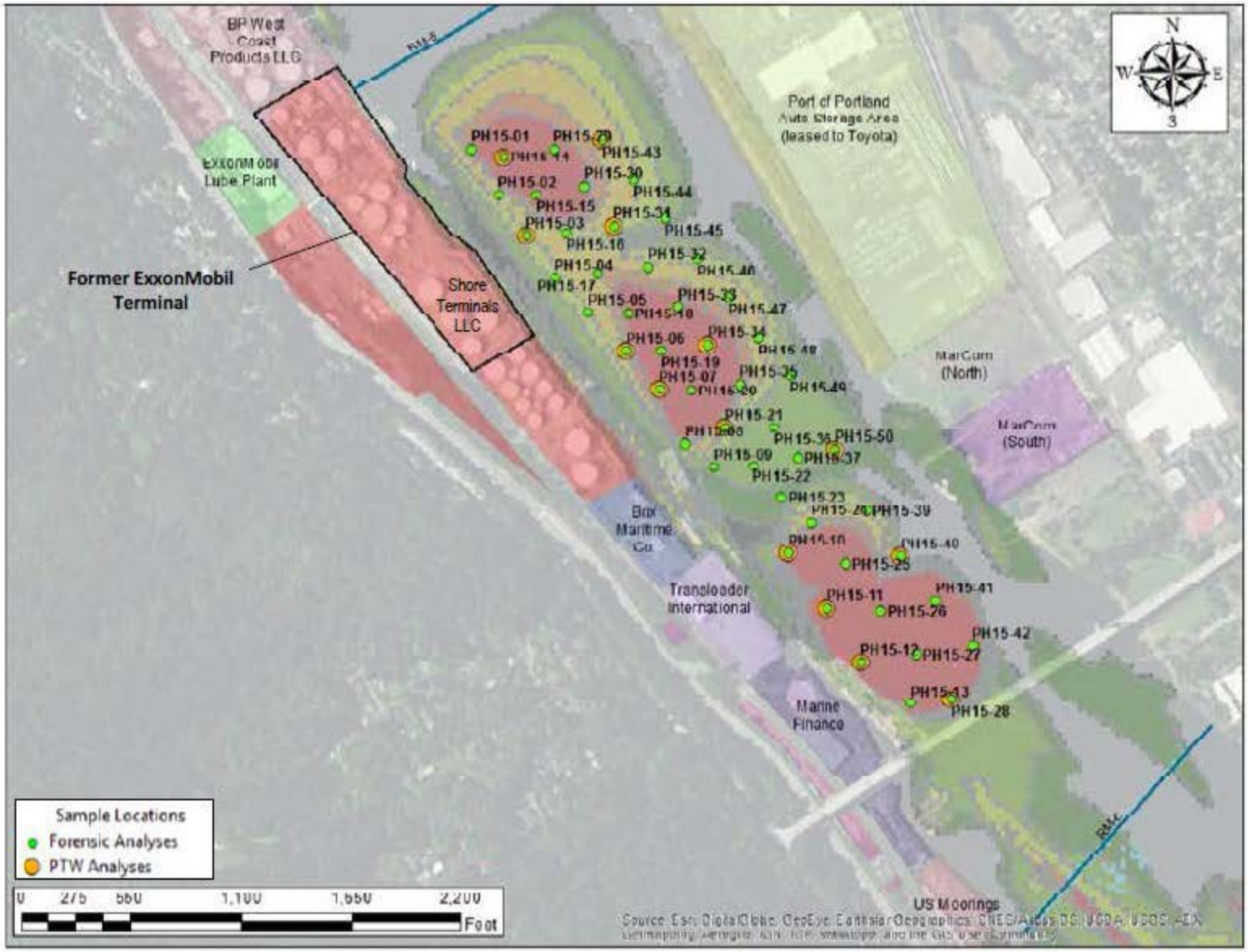


Figure 2. Sediment sampling locations for the NewFields 2015 investigation.

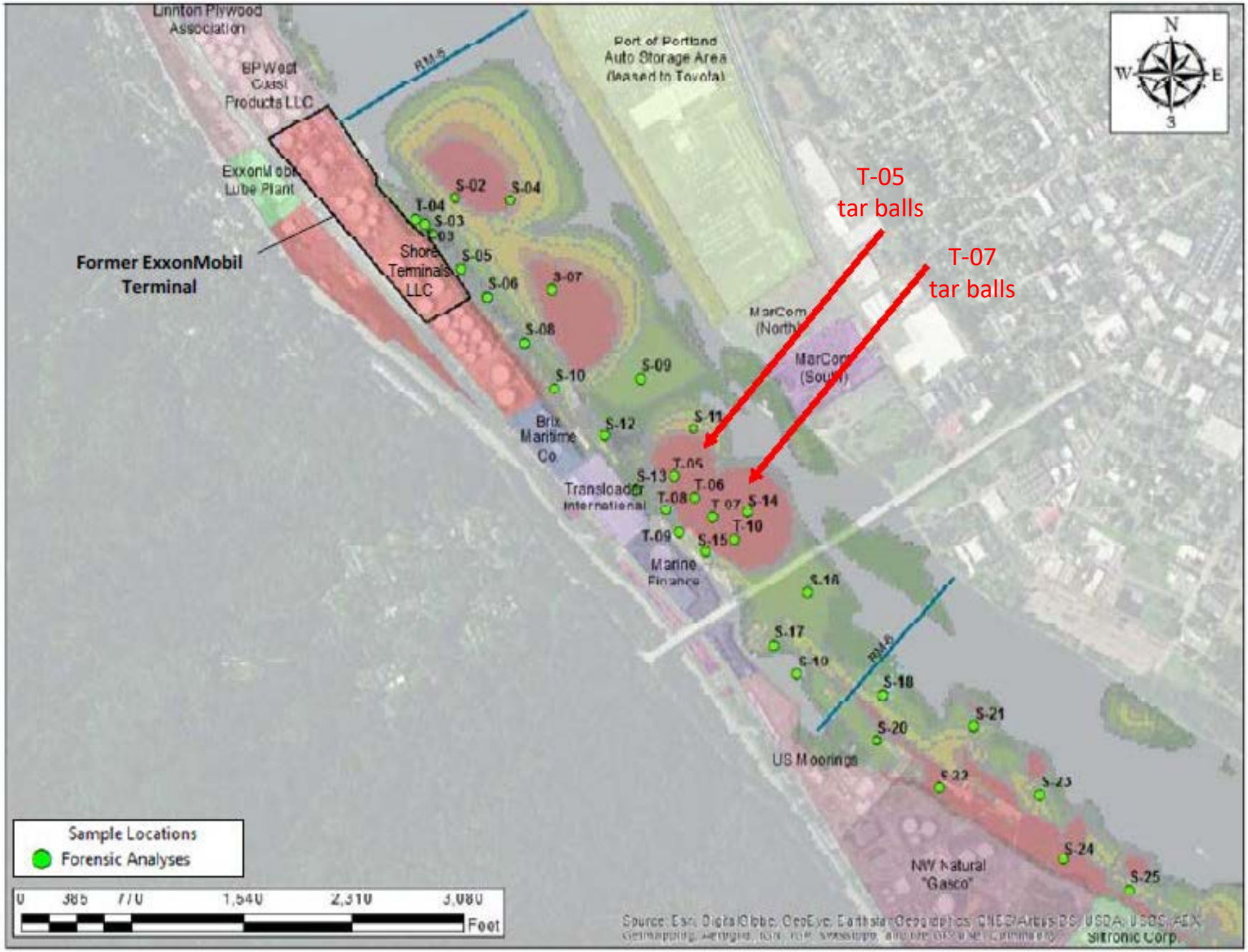


Figure 3. Sediment sampling locations for the NewFields 2014 Investigation.

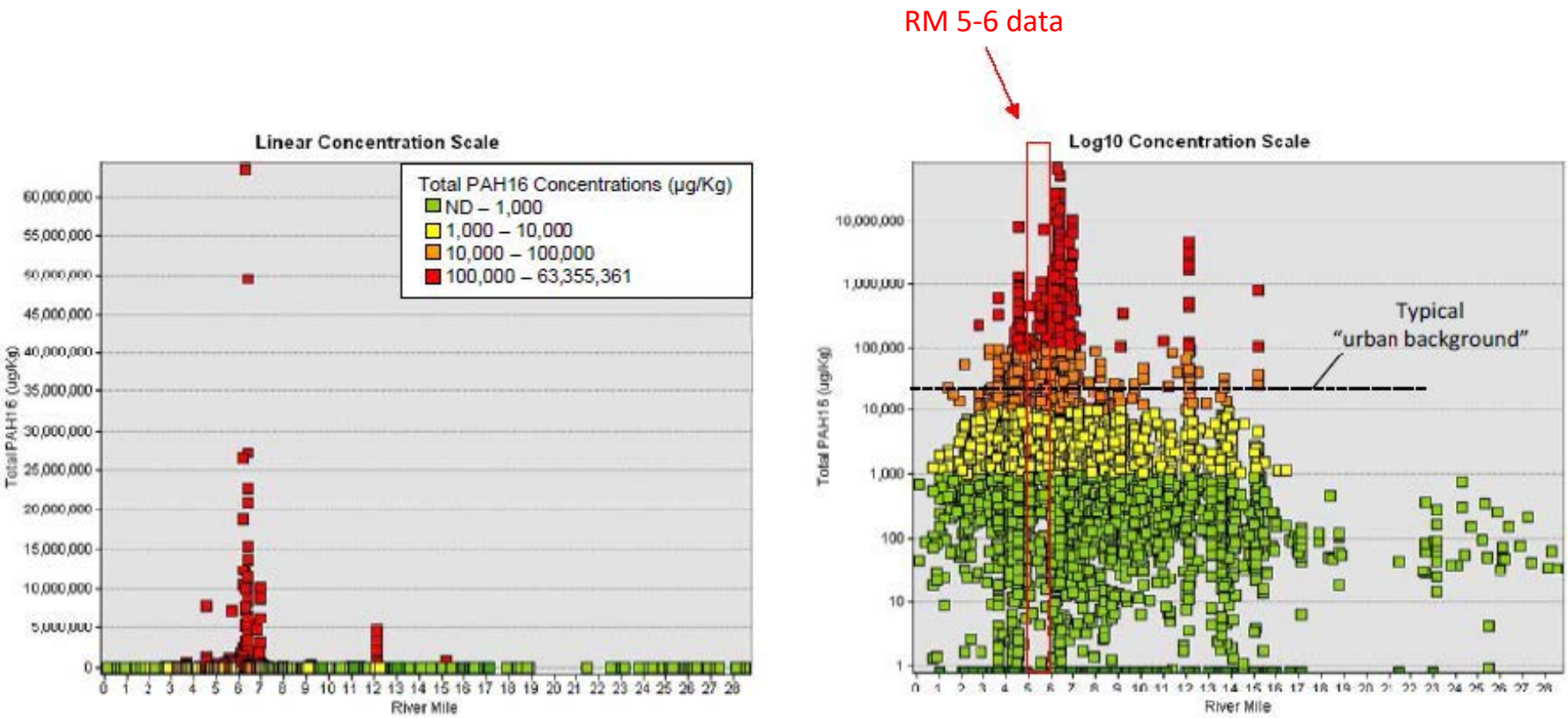


Figure 6. Concentration of 16 Priority Pollutant PAH vs River Mile in the Portland Harbor Superfund Site Area.

Left panel: linear concentration scale; Right panel: Log10 concentration scale. Dashed line: upper limit of "urban background" sediments proposed by Stout et al. (2004).

Source: Lower Willamette Group RI Database.

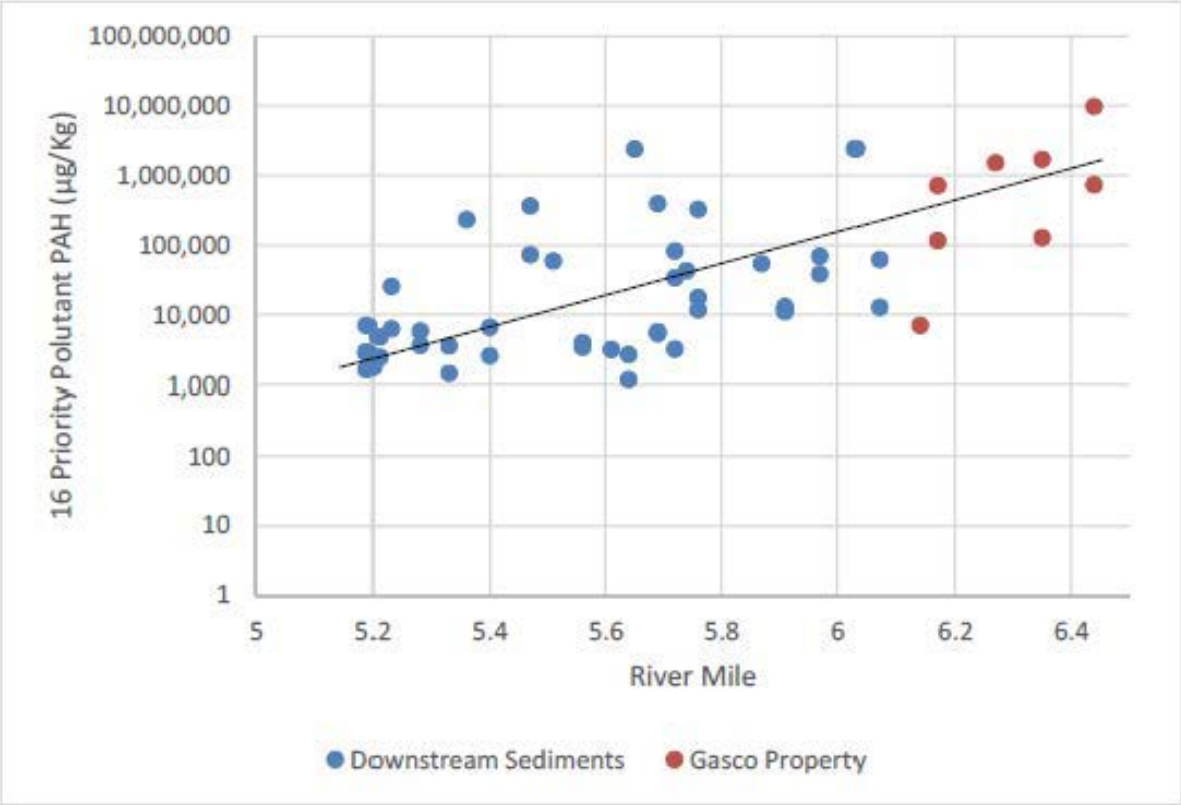


Figure 7. Surface and subsurface PAH concentrations versus River Mile in the vicinity of River Mile 5 and River Mile 6. PAH concentrations generally decrease downstream of the Gasco property.

Source: NewFields 2014 Investigation.

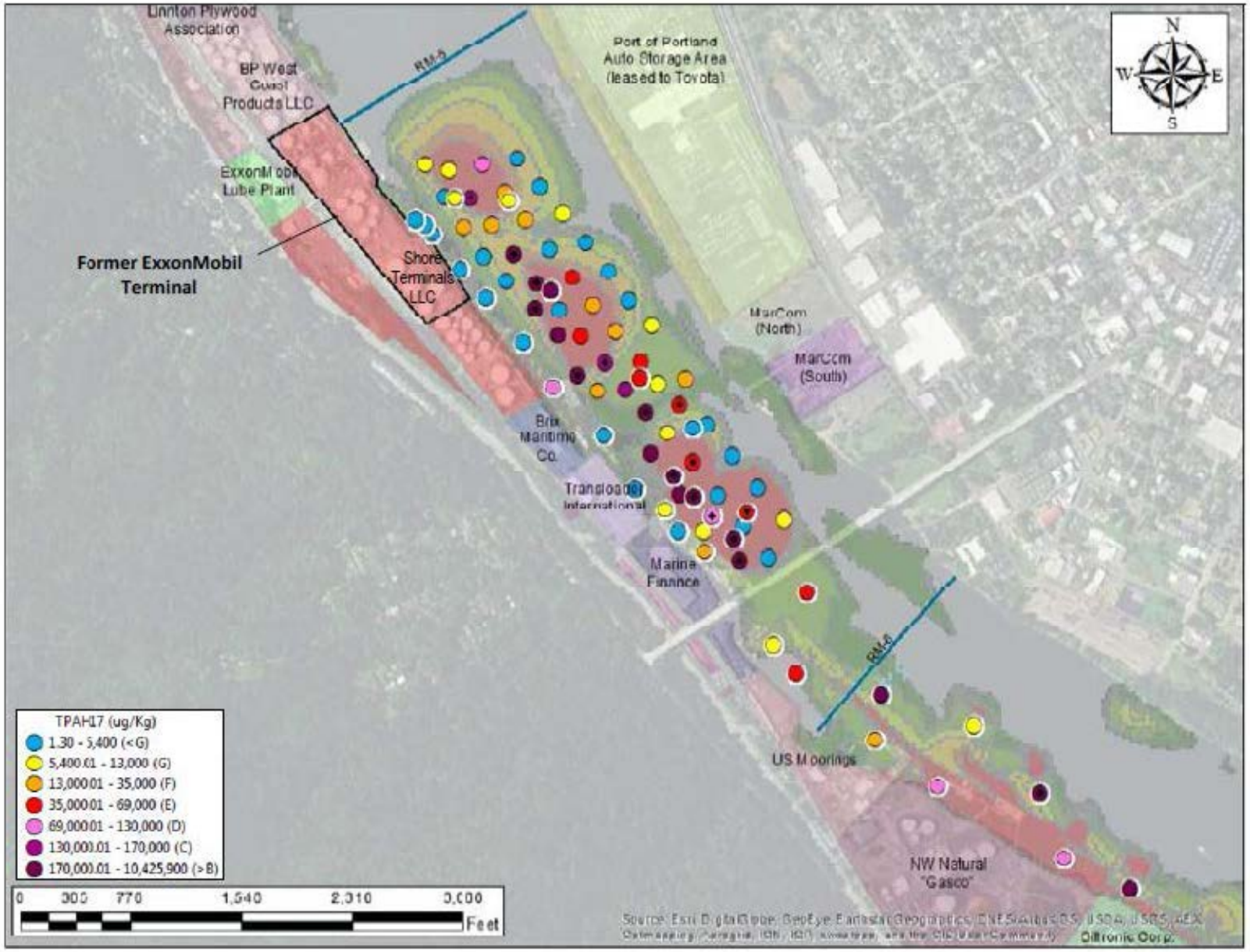


Figure 8 (a). Surface sediment TPAH17 concentrations (by RAL).

Note: Symbols with white halos represent samples collected in 2014.
Black bullets represent locations where tar balls were observed.

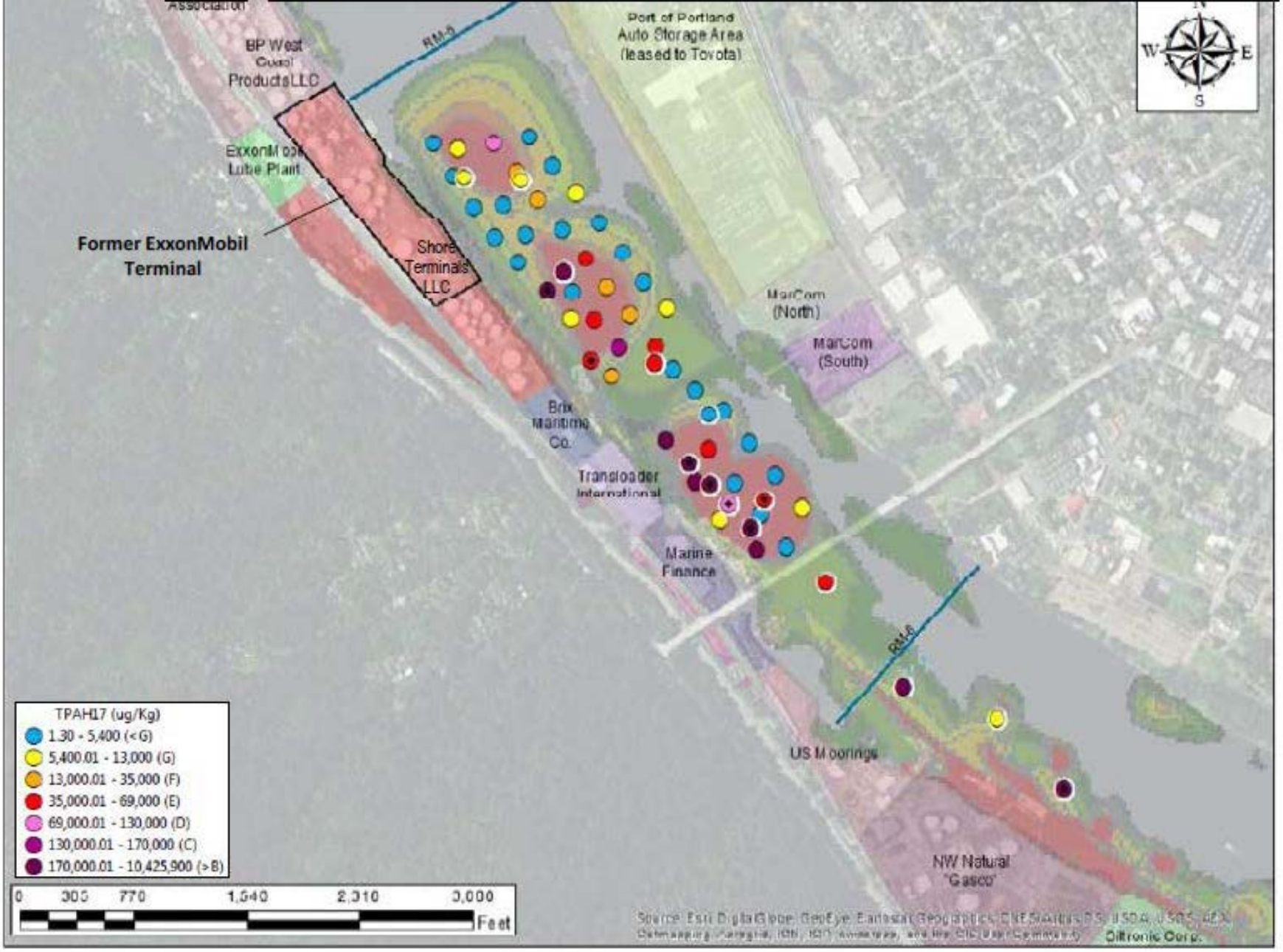


Figure 8 (b). Future channel (-48 to -49 ft) depth sediment TPAH17 concentrations (by RAL).

Note: Symbols with white halos represent samples collected in 2014.
Black bullets represent locations where tar balls were observed.

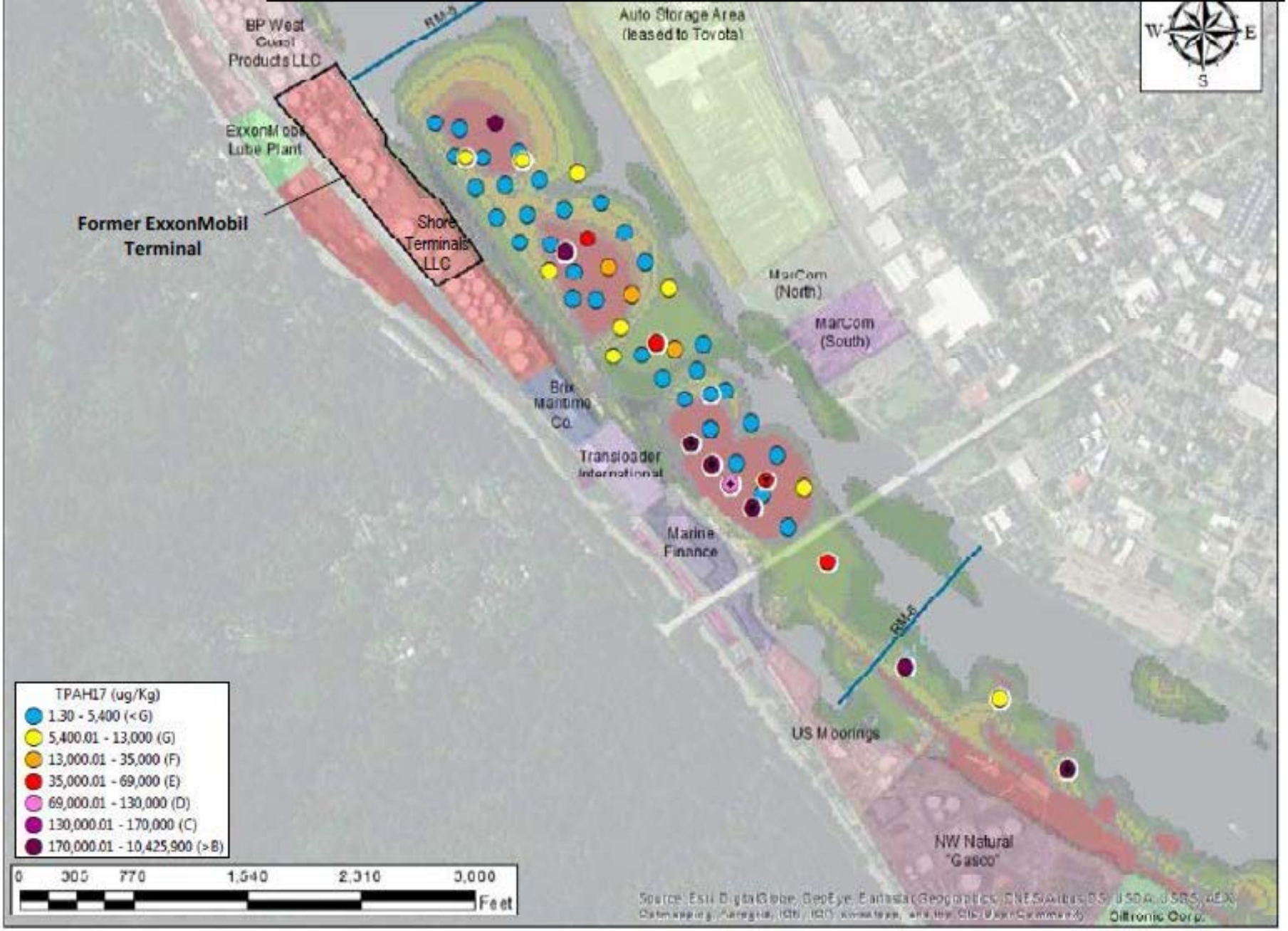


Figure 8 (c). Future overdredge (-51 to -52 ft) depth sediment TPAH17 concentrations (by RAL).

Note: Symbols with white halos represent samples collected in 2014.

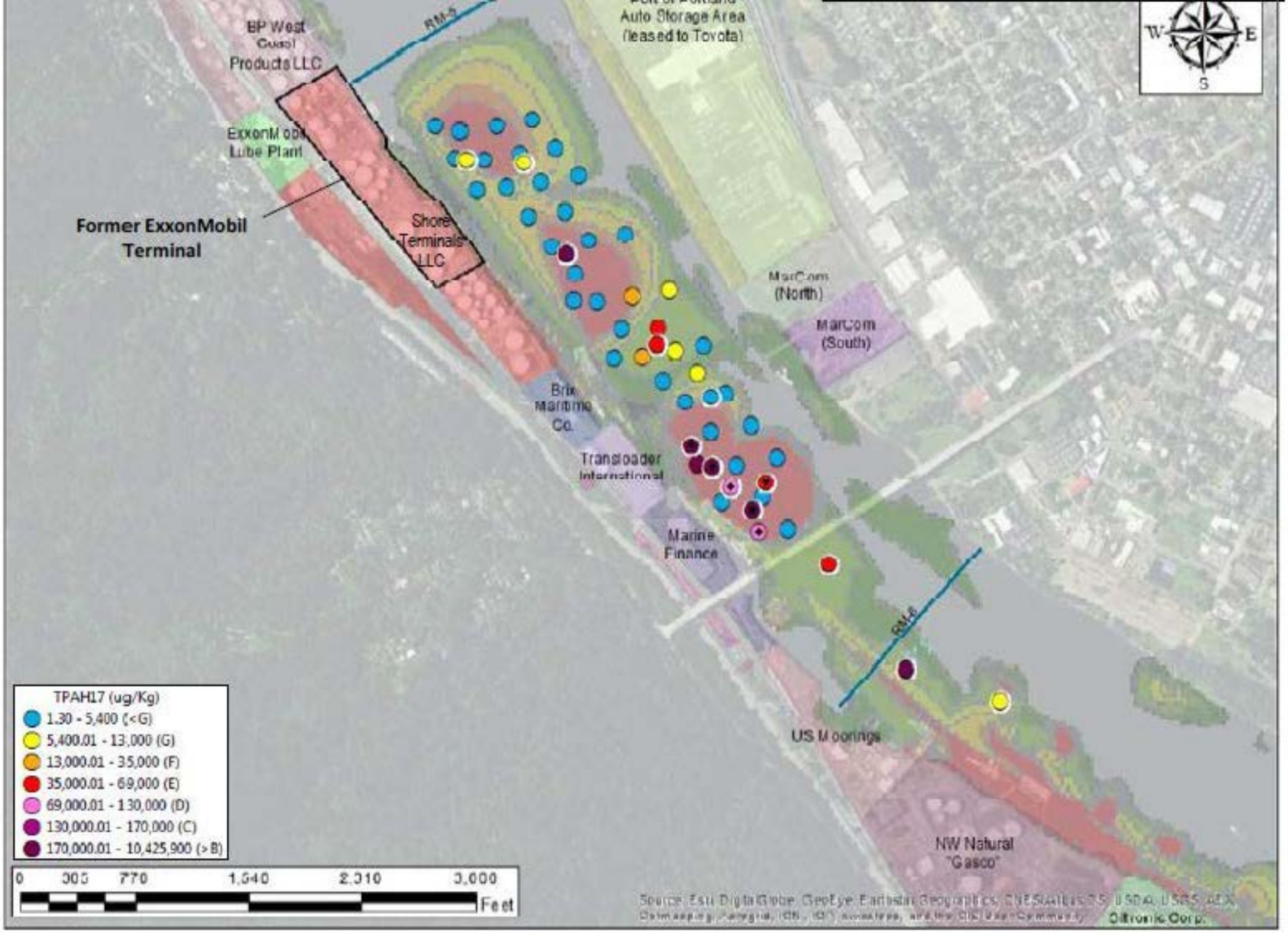
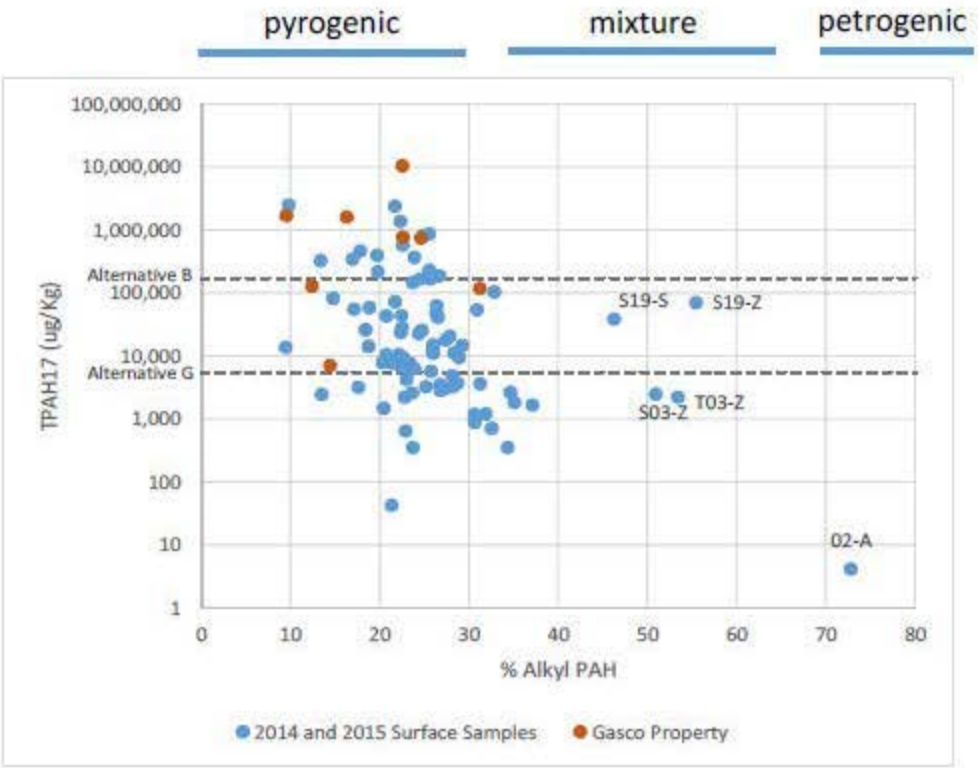
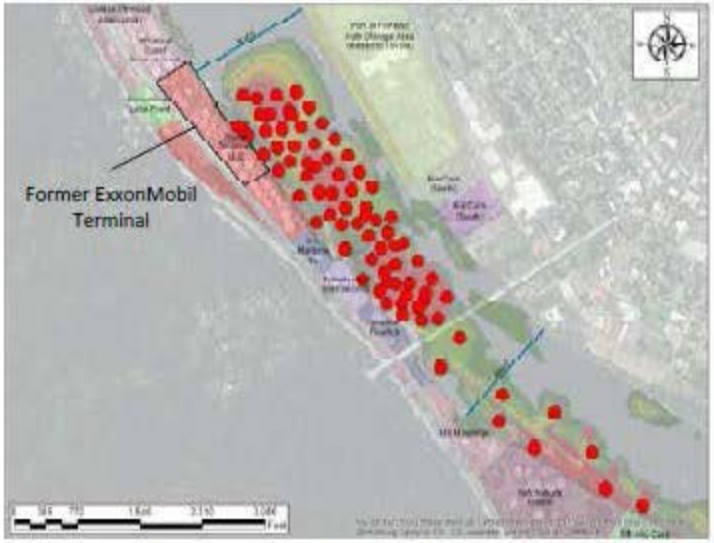


Figure 8 (d). Future channel plus cap (-53 to -54 ft) depth sediment TPAH17 concentrations (by RAL).

Note: Symbols with white halos represent samples collected in 2014.



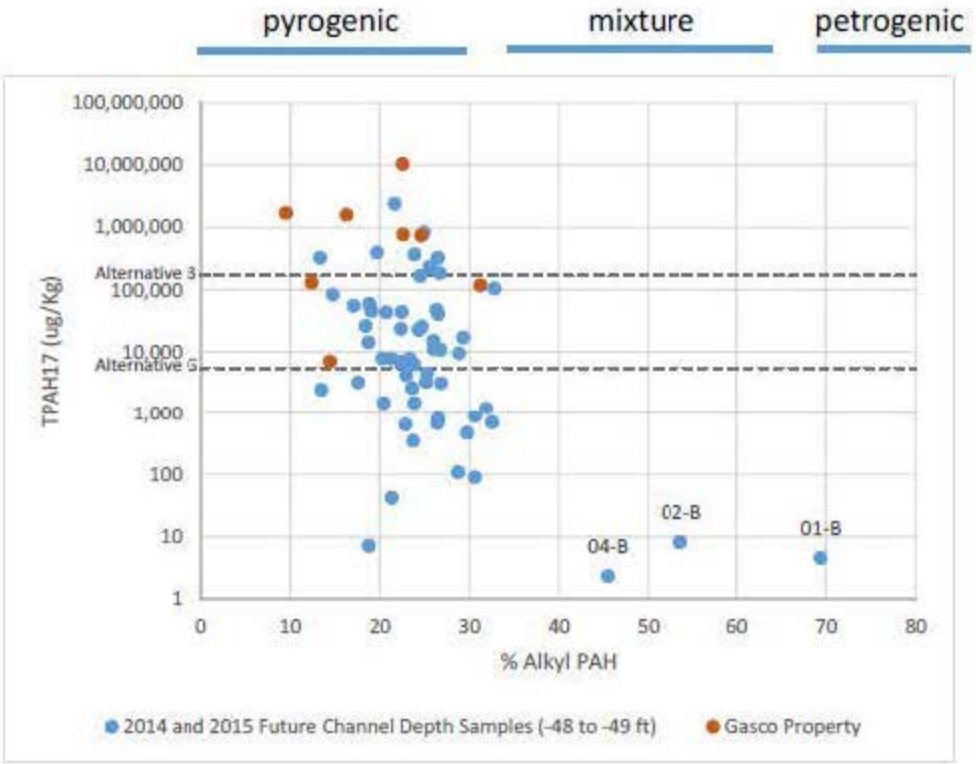
Graph (above) depicts discrete samples. Maps (right) depict sample locations. Prefixes for 2015 (PH15-) sample IDs in graph are truncated.



Locations where PAH are pyrogenic dominant.

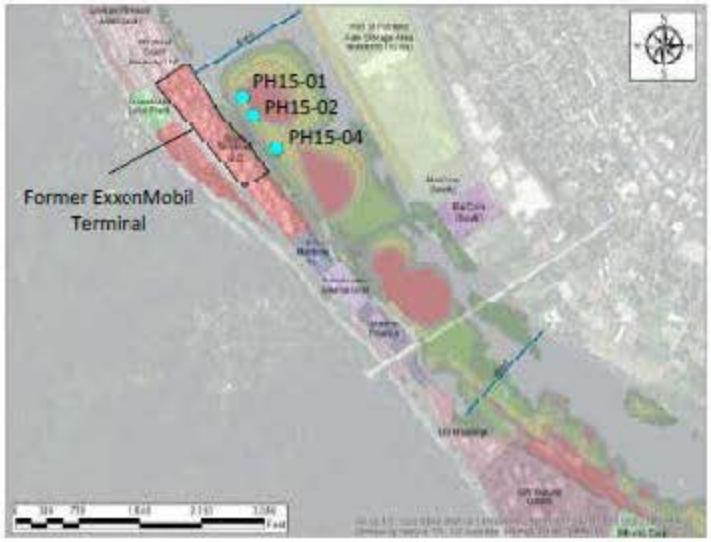
Locations where PAH are petrogenic dominant.

Figure 15 (a). The source character of PAH at the sediment surface (0 to -1 ft interval)
Top left panel: Locations of pyrogenic dominant PAH.
Bottom left panel: Locations of petrogenic dominant PAH.



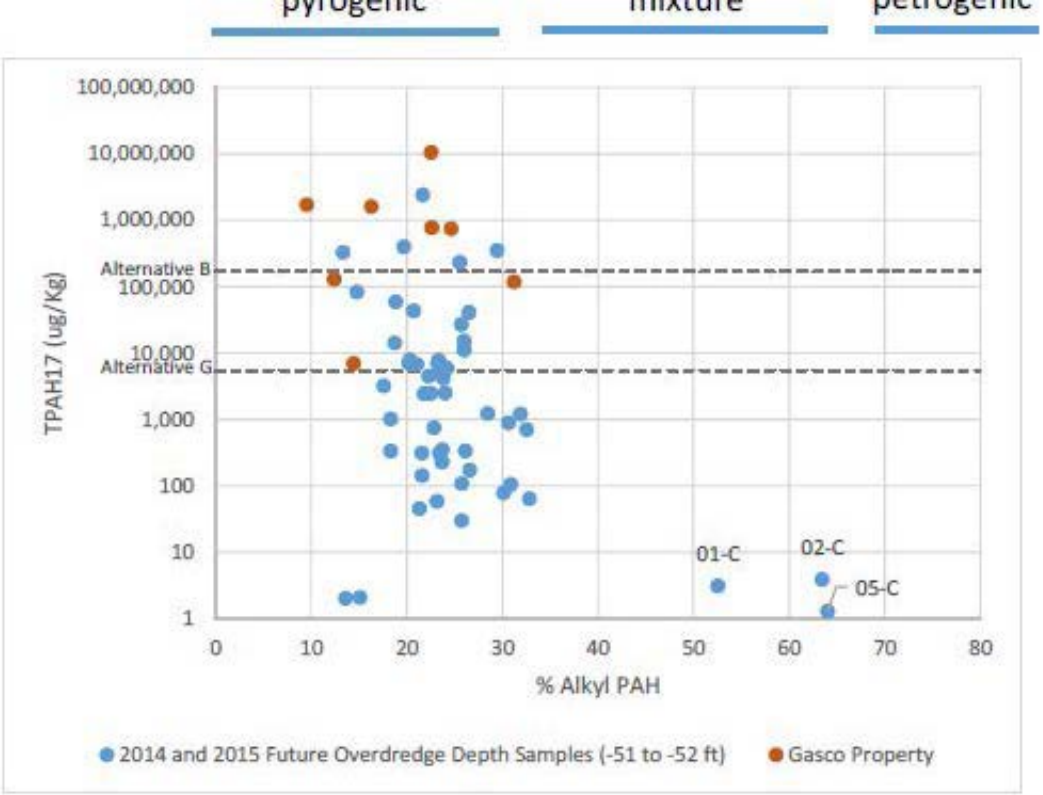
Graph (above) depicts discrete samples. Maps (right) depict sample locations. Prefixes for 2015 (PH15-) sample IDs in graph are truncated.

Locations where PAH are pyrogenic dominant.

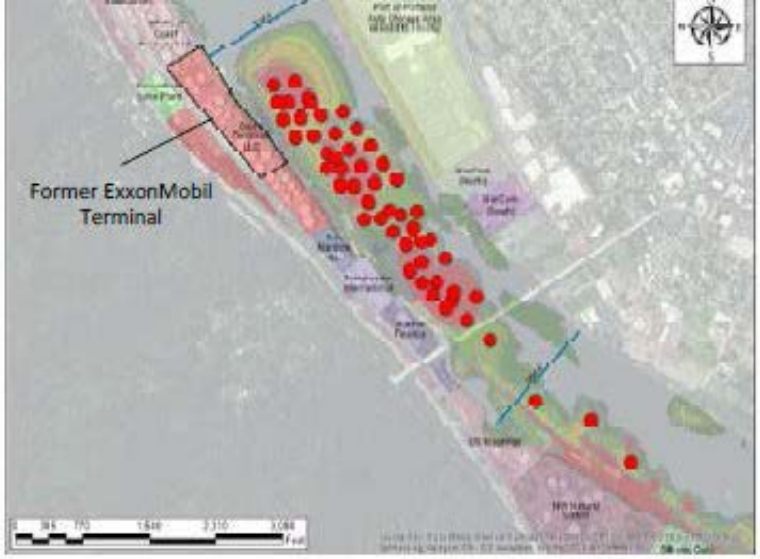


Locations where PAH are petrogenic dominant.

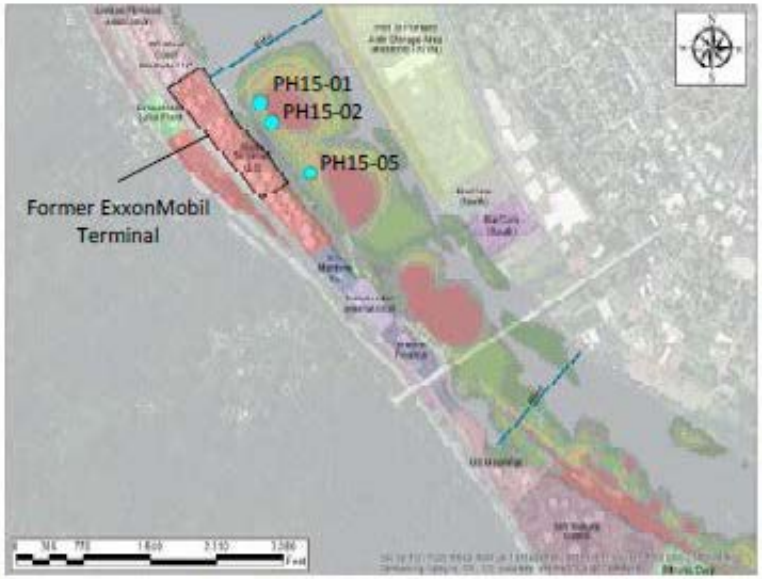
Figure 15 (b). The source character of PAH at the future channel depth horizon (-48' to -49' CRD interval)
Top left panel: Locations of pyrogenic dominant PAH.
Bottom left panel: Locations of petrogenic dominant PAH.



Graph (above) depicts discrete samples. Maps (right) depict sample locations. Prefixes for 2015 (PH15-) sample IDs in graph are truncated.

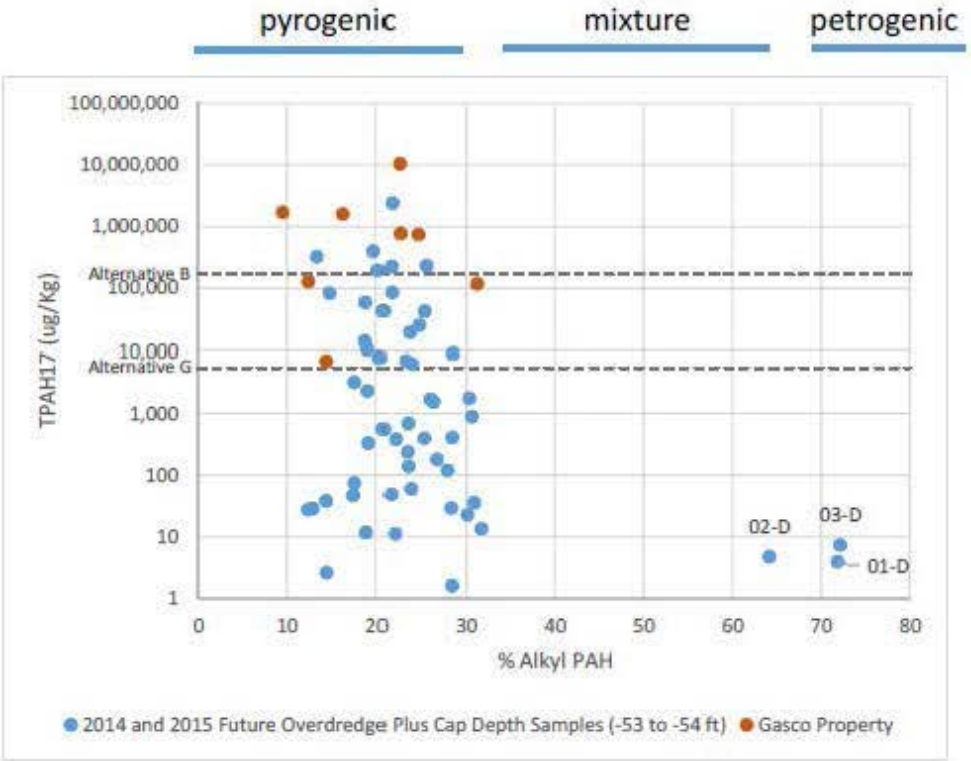


Locations where PAH are pyrogenic dominant.

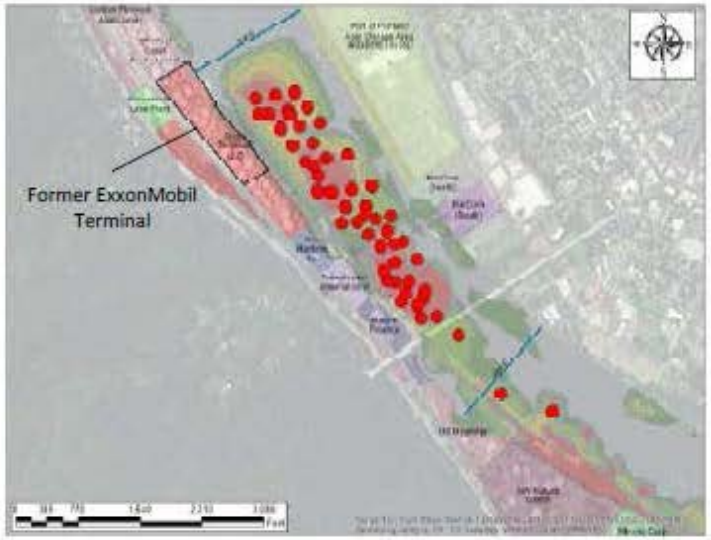


Locations where PAH are petrogenic dominant.

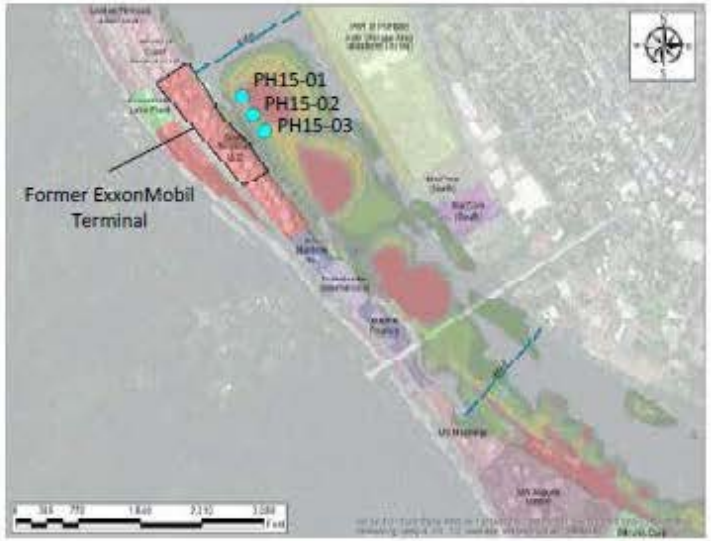
Figure 15 (c). The source character of PAH at the future overdredge depth horizon (-51' to -52' CRD interval).
Top left panel: Locations of pyrogenic dominant PAH.
Bottom left panel: Locations of petrogenic dominant PAH.



Graph (above) depicts discrete samples. Maps (right) depict sample locations. Prefixes for 2015 (PH15-) sample IDs in graph are truncated.



Locations where PAH are pyrogenic dominant.



Locations where PAH are petrogenic dominant.

Figure 15 (d). The source character of PAH at the future overdredge plus cap depth horizon (-53' to -54' CRD interval).
Top left panel: Locations of pyrogenic dominant PAH.
Bottom left panel: Locations of petrogenic dominant PAH.

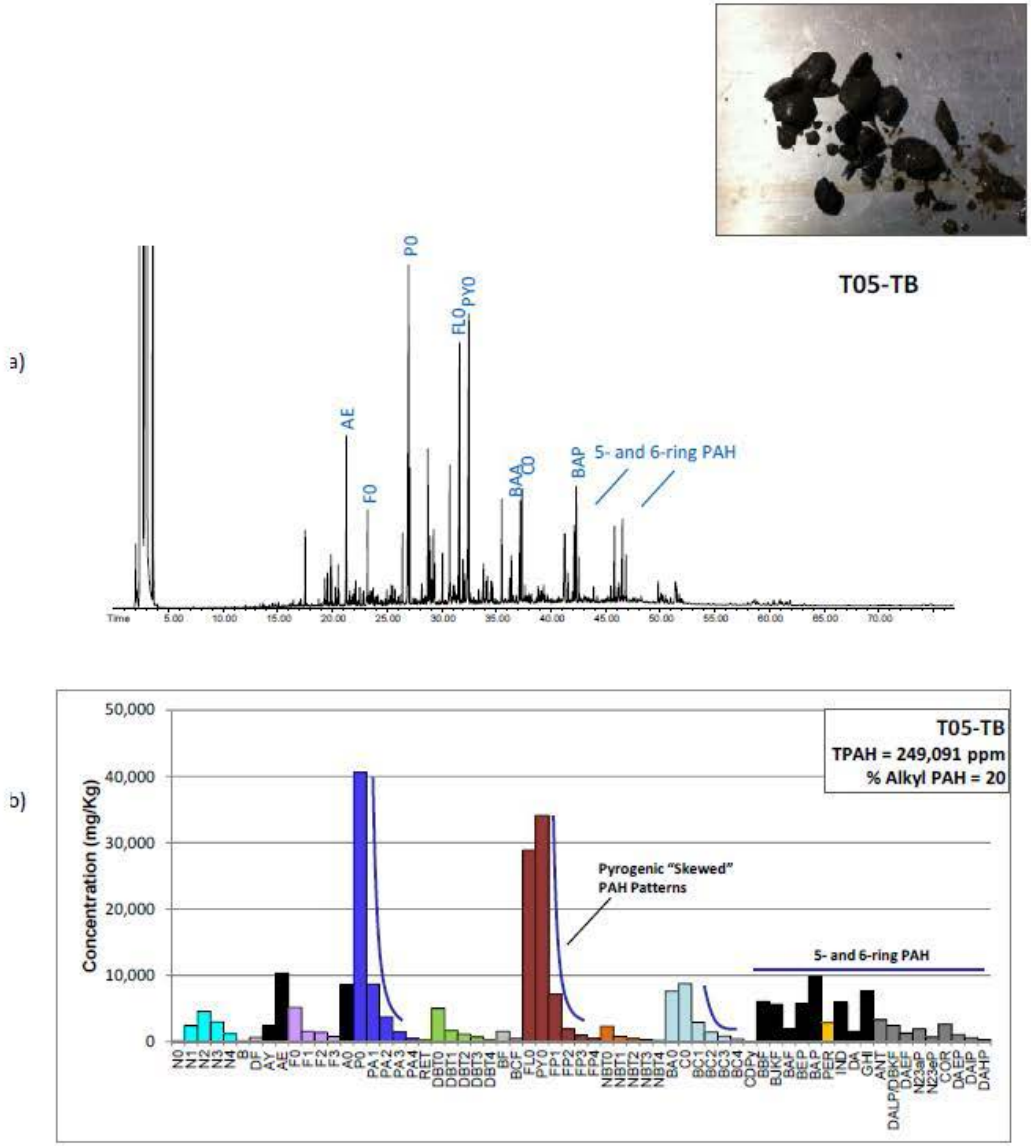


Figure 26. Gas chromatogram (a) and PAH histogram (b) for the tar ball sample of opportunity T-05, collected in CBRA 9D-3. Photograph of tar ball sample shown in upper right.

'*': laboratory-added internal standards