

# NovaTox

## Human Health and Ecological Risk Assessment, Keewatin Small Craft Harbour, Kenora, Ontario

### Client

Public Works and  
Government Services  
Canada

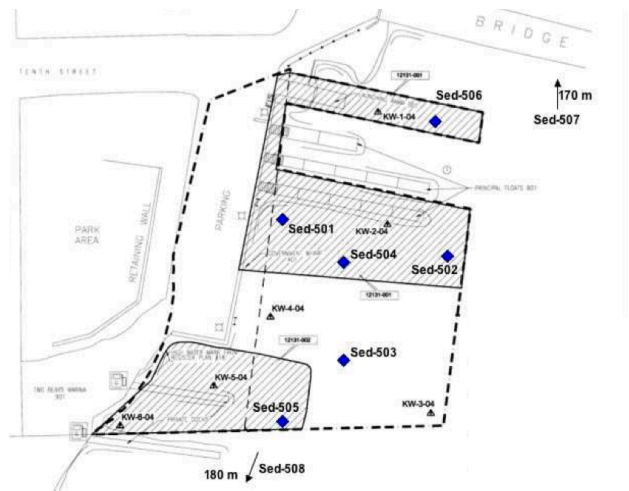
### Location

Kenora, Ontario

### Date Completed

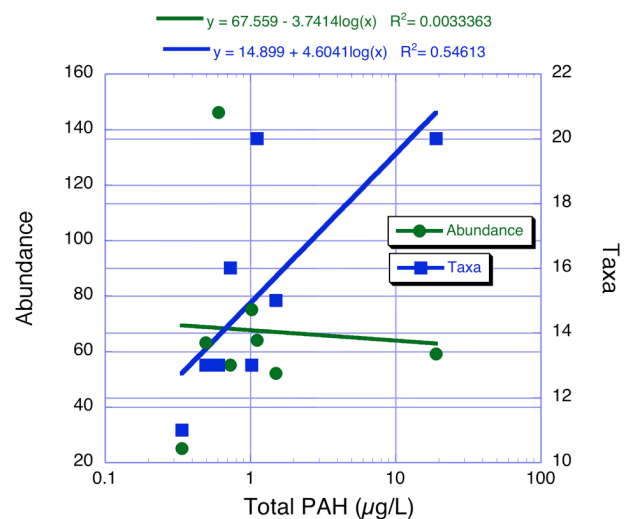
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NovaTox staff conducted an Ecological Risk Assessment (ERA) and Human Health Risk Assessment (HHRA) for PWGSC on behalf of Fisheries and Oceans Canada to estimate risks of adverse effects in humans and ecological receptors from contaminants in sediments at the Keewatin Small Craft Harbour in Kenora, Ontario. The site consists of an upland portion and a water lot with a constructed steel sheet pile wharf, several principal timber floats, and a launch ramp.



A Preliminary Quantitative ERA consistent with federal (CCME) guidance was conducted to evaluate potential impacts to ecological receptors, and included Problem Formulation, Receptor Characterization, Exposure Assessment, Hazard Assessment, and Risk Characterization sections. Contaminants of potential concern were identified by screening against federal and provincial sediment quality guidelines as well as local reference locations, and included PAHs, heavy metals, and other inorganics. The ERA was conducted as a "sediment triad" using three lines of evidence: (1) analytical sampling data; (2) benthic invertebrate survey; and (3) sediment toxicity testing. A staged approach was considered appropriate for this site, in which toxicity testing was only conducted if the results of the benthic survey suggested effects on resident biota. Hazard quotients were generated by comparing bulk sediment concentrations (all COCs) or estimated pore water concentrations (PAHs) to appropriate benchmark concentrations derived from toxicological studies with freshwater invertebrates. A benthic invertebrate survey at the site and at nearby reference locations revealed an apparently healthy community with good diversity and several species indicative of high-quality sediments. Consistent with provincial guidance, evidence from the biological survey was given more weight than chemistry results, and it was concluded that risk of adverse effects to ecological receptors at the site were acceptable based on the benthic survey.

Risks to humans from daily inadvertent exposure to sediments through wading or swimming at the site were evaluated for children, teens, and adults. Weighted daily doses were compared to appropriate reference doses and cancer risk slope factors. Hazard quotients for all contaminants were less than 0.2, and cancer risk factors were all less than  $10^{-5}$ , indicating risks to human receptors at the site were acceptable.



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