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Western Pacific Marine Ltd.
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April 21, 2017

Re: Balfour Osprey 2000 Gear Oil Spill - Summary of SCAT Assessment - April 20, 2017

Survey Date: April 20, 2017. 9:00 – 12:30

Weather: Light rain, cool.

Crew: Ico de Zwart, Allan Irvine

Kootenay Lake Level (Queen's Bay): 531.93 m

Kootenay Lake level at time of incident: 531.97 m

Kootenay Lake forecast for April 28, 2017: 532.15 m

Eight sections of shoreline on the West Arm of Kootenay Lake were assessed during the April 17th initial Shoreline Cleanup Assessment Technique (SCAT) survey (Table 1). On April 20, 2017, sections were resurveyed using the SCAT 'River Bank Shoreline Oiling Survey Form'. Sections 2 – 4 were divided into subsections based on observed conditions with results summarized below (Table 2, Figure 1, Photos 1 - 16). A summary of the April 20, 2017 SCAT assessment, shoreline treatment options and monitoring follows.

Table 1. Sections delineated during the April 17th initial SCAT survey.

Section ID	*Length (m)	Comments
1	120	Upstream of Terminal - From second dock upstream of terminal piers to dock in front of Holly's Diner.
2	95	Downstream of Terminal - From dock in front of Holly's Diner to Dock'n' Duck dock.
3	90	Downstream of Dock 'n' Duck - From Dock'n' Duck dock to small old docks.
4	85	Upstream of First Marina Dock - From small old docks to first marina dock.
5	70	Downstream of First Marina Dock - First marina dock to Graham Marine dock.
6	150	Downstream of Graham Marine - Graham Marine dock to dock government boat launch.
7	315	Downstream of Government Boat Launch - Government boat launch to private dock 315 m downstream.
Total	925	Results of April 17, 2017 SCAT survey indicate oil observed on 495 m of river bank shoreline

*Bolded lengths indicate river bank shoreline sections where oil was observed during April 17, 2017 SCAT Survey.

Table 2. Sub-sections and assessment summary from April 20th SCAT survey.

Sub Section ID	Length (m)	Comments
1	120	Upstream. No oil detectable by sight, smell or feel. No subsurface oil. No impacted wildlife observed.
2a	15	No oil visible on shoreline. No subsurface oil. Silver film when shoreline washed. No ambient smell. No impacted wildlife observed.
2b	2	Under ferry ramp by upstream pier. No oil visible on shoreline. No subsurface oil. Silver to iridescent film produced when shoreline washed. No ambient smell. Slight odor when handfuls of sand brought to nose. No impacted wildlife observed.
2c	73	No oil visible on shoreline. No subsurface oil. Silver film produced when shoreline washed. No ambient smell. No impacted wildlife observed.
2d	5	Either side of Dock 'n' Duck dock. No oil visible on shoreline. No subsurface oil. Silver to iridescent film produced when shoreline washed. Silver film around dock. No ambient smell. Slight odor when handfuls of sand brought to nose. No impacted wildlife observed.
3a	79	No oil visible on shoreline. No subsurface oil. Silver film produced when shoreline washed. No ambient smell. No impacted wildlife observed.
3b	11	Either side of two old small docks. No oil visible on shoreline. No subsurface oil. Silver to iridescent film produced when shoreline washed. Silver film around dock. No ambient smell. Slight odor when handfuls of sand brought to nose. No impacted wildlife observed.
4a	75	No oil visible on shoreline. No subsurface oil. Silver film produced when shoreline washed. No ambient smell. No impacted wildlife observed.
4b	10	Either side of first Marina dock. No oil visible on shoreline. No subsurface oil. Silver to iridescent film produced when shoreline washed. Silver film around dock. No ambient smell. Slight odor when handfuls of sand brought to nose. No impacted wildlife observed.
5	70	No oil visible on shoreline. No subsurface oil. Silver film produced when shoreline washed. Light silver film around docks in quiet areas. No ambient smell. No impacted wildlife observed.
6	150	No oil detectable on shoreline by sight, smell or feel. Light silver film around docks in quiet areas. No impacted wildlife observed.
7	315	No oil detectable by sight, smell or feel. No subsurface oil. No impacted wildlife observed.

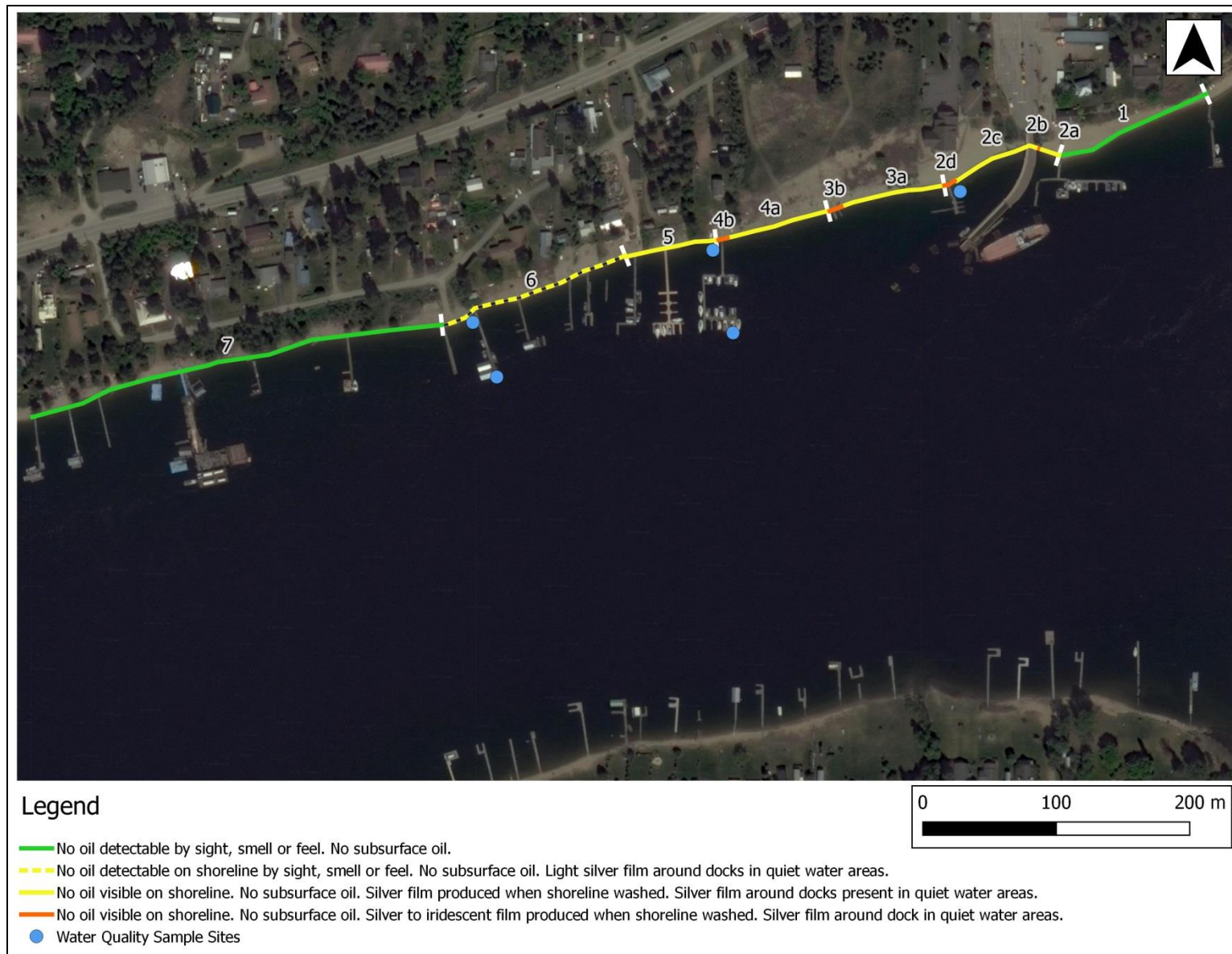


Figure 1. Map of sub-sections and assessment result summary.



Photo 1. Section 1– downstream view.



Photo 2. Section 2a– upstream view



Photo 3. Section 2a - Silver film when shoreline washed.



Photo 4. Section 2b (under ferry ramp) – silver to iridescent film observed when shoreline washed.



Photo 5. Section 2b – pit – no film or subsurface oil present



Photo 6. Section 2c – downstream view.



Photo 7. Section 2d – silver to iridescent film on downstream side of Dock 'n' Duck dock after washing of shoreline.



Photo 8. Section 3a – downstream view



Photo 9. Section 3b – silver to iridescent film observed in quiet area between small docks at downstream end of section

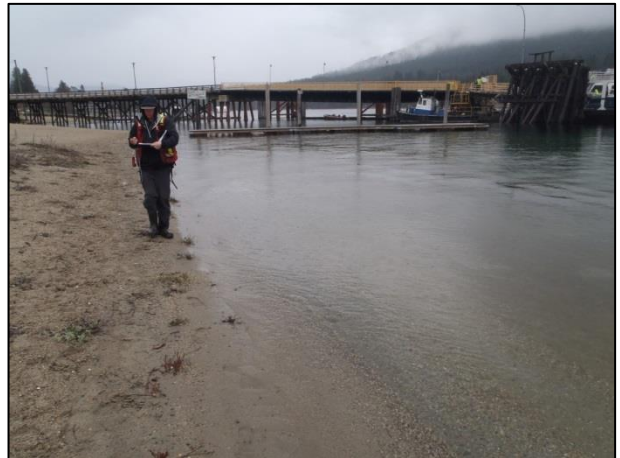


Photo 10. Section 4a – upstream view



Photo 11. Section 4b –silver film present in quiet areas around marina dock and boat slips



Photo 12. Section 5 – downstream view



Photo 13. Section 5 – Light silver film around docks in quiet areas



Photo 14. Section 6 – downstream view



Photo 15. Section 6 - Light silver film around docks in quiet areas



Photo 16. Section 7 - Upstream view

Assessment Summary

- Water
 - No film observed along shoreline away from docks.
 - Silver film from product observed on water surface next to docks and boat slips in Sections 4 – 6. Product collects in quietest areas where water does not flow through structures.
 - Silver to iridescent film observed in quiet water areas around docks in Subsections 2d, 3b and 4b.
- Shoreline
 - No oil visible on shoreline in any section.
 - No oil detectable by feel in any section.
 - Washing the shoreline within 1 – 2 m of water level generates no film throughout Sections 1, 6 and 7.
 - Washing the shoreline within 1 – 2 m of water level generates silver film throughout most of Sections 2 – 5.
 - Washing the shoreline within 1 – 2 m of water level generates silver to iridescent film within Sub-sections 2b, 2d, 3b and 4b (combined length of 28 m).
 - Subsurface
 - No subsurface oil present in any Section.
 - No film observed in any pits excavated in Sections 2 – 6.
 - Odor
 - No ambient smell in any sections.
 - Slight odor detectable when handfuls of affected sand brought to nose in Sub-sections 2b, 2d, 3b and 4b (combined length of 28 m).
- Wildlife
 - No impacted wildlife observed.

Treatment Options

1. Allow oil to be removed by natural processes.
 - Significant flushing of the shoreline substrates has occurred at the site over the last 5 days due to flows, wave action, precipitation and fluctuating water levels in the West Arm of Kootenay Lake. Fortis BC forecasts that water levels in the main lake will rise to 0.18 m above the levels recorded at the time of the spill by April 28, 2017. Levels will likely rise well beyond these elevations throughout the spring. Continued flushing of the product through these processes and continued improvement is expected.
2. Temporary relocation of docks in sub-section 3b to increase lake water circulation to shoreline area.
3. Remobilizing oil in Subsections 2b, 2d, 3b and 4b by raking.
 - Remobilization of product in these areas will result in some reductions in product concentrations if wind and/or current directs floating product downstream.

Monitoring

Completed:

- SCAT shoreline assessments on April 17th and 20th.
- Water quality samples taken April 16th, 17th and 19th to document baseline and follow up conditions (Figure 1). Samples were tested for hydrocarbons. Results are pending.

Planned:

- SCAT survey in 5 – 7 days.
- Water sampling in 5 – 7 days.

If you have any questions or comments please feel free to contact us.

Sincerely,

Al Irvine, RPBio

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