Western Canadian Spill Services Ltd.

OIL SPILL COOPERATIVE

Member Newsletter

SUMMER 2013 | VOLUME 2 | ISSUE 8

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WCSS REPRESENTATIVES 2013 – 2014

On June 13, WCSS held its 17th Annual General Meeting in Calgary where the following Board of Directors' members were voted in until the 18th Annual General Meeting is held, on or about June 13, 2014:

Larry Bell, Chairman	Bell Energy	Independent
Michael Gadde, Provincial Chairman	Talisman Energy	CAPP
Lois Garrett	Husky Energy	CAPP
Gary Beuk	Imperial Oil	CAPP
Pending		EPAC
Dan O'Rourke	Kinder Morgan	Pipelines
Greg Carter	Enbridge	Pipelines
Al McFadyen, President & COO	WCSS	WCSS

The WCSS Executive Sub-committee at June 13th is listed as follows:

Michael Gadde	Provincial Chairman		Talisman Energy
Lorne Schmidt	Zone 1	Areas P, Q, S	Enerplus Energy Fund
Marvin St. Louis	Zone 2	Areas H, M, N, O, U	Apache Canada
Dave Clough	Zone 3	Areas I/J, G	Suncor Energy
Chris Labrie	Zone 4	Areas D, W	Plains Midstream Canada
Trent Myck	Zone 5	Areas VR-1, Y	Imperial Oil
S. Ken Chalmers	Zone 6	Areas A, C, E, T	TAQA North
Nolan Steinwand	Ad Hoc		Pengrowth Corp
Al McFadyen	WCSS President & COO		WCSS
Mike Locke	WCSS Operations Manager		WCSS

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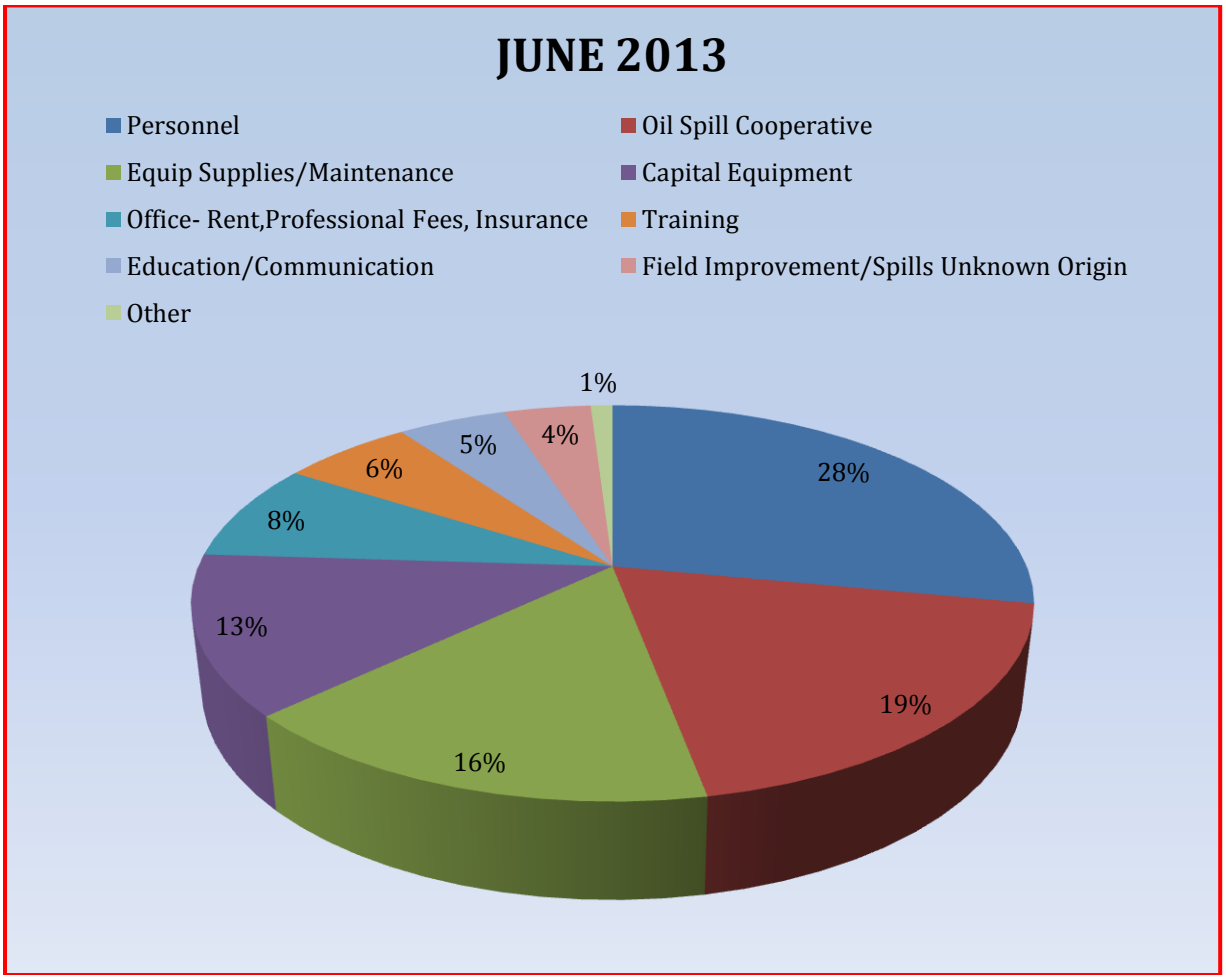
WCSS Membership 2013

The WCSS annual membership fee package was distributed in late March and, as of June 17th, 450 of the 605 licensees invoiced have paid their 2013 membership fees; the members in good standing list can be viewed on the WCSS website www.wcss.ab.ca. Please ensure that your company is in good standing.

WCSS is happy to report that there has been no increase in membership fees again in 2013; the last change to the fee formula was in 2011 when the service fee and cost per wells was reduced. The following chart outlines how WCSS funds are allocated:



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The 2012 Red Deer River Oil Spill: Analyzing Environmental Impacts in the Floodplain Zone

Stewart Rood, Professor, and Evan Hillman, MSc student
Environmental Science, University of Lethbridge

Our research investigates rivers and floodplain woodlands with emphasis on the impacts of river dams and instream flow regulation. We have long-term studies along the Red Deer River upstream and downstream from the Dickson Dam and Gleniffer Reservoir, and we were consequently interested in the oil spill in the River Deer River near Sundre, in early June, 2012. That spill resulted from the rupture of a Plains Midstream 'Rangeland' crude oil pipeline that was caused by a river flood. The swift flow eroded the channel bed and banks, leading to the exposure and rupture of the pipeline, and release of around 3000 barrels of light sour crude oil.

There is substantial current interest in the environmental impacts from oil spills due to pipeline failures, particularly associated with the Keystone XL and Northern Gateway proposals. However, despite a long history of pipeline failures in river crossings, there has been very little critical analysis of the environmental impacts in the floodplain zones. Since the pipeline failures are often caused by floods, the spilled oil commonly flows through floodplain zones. These zones are environmentally rich and support critical environmental services including wildlife habitat, water quality and bank stability.

With the pipeline failure at Sundre, there was extensive media coverage and some observers used terms such as 'catastrophic' or 'devastation', to describe the anticipated ecological impact. As river scientists with some prior knowledge of the Red Deer River system, we decided to undertake our own investigation to assess the severity and consequences of the spill. As soon as the rain eased off, we launched our raft to float a 15 km river reach downstream from the spill.

We observed the river banks and floodplain zones and established three research sites at locations with heavier coatings of oil on the vegetation and shoreline. We informed Plains Midstream and Alberta Environment (AESRD) of our sites and requested that these not be cleaned-up. Our intent was to investigate the environmental consequences and possible natural recovery of the floodplain woodland. AESRD approved our request but there was partial vegetation removal at one of our sites. This actually benefited the study as it provided another level of comparison.

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University of Lethbridge student Evan Hillman at a study site along the Red Deer River, four days after the pipeline rupture. Note the black band of crude oil coating the saplings of the balsam poplars and willows. (photo: Stewart Rood)

The riparian or floodplain zones adjacent to the braided river channels support three predominant plants. Balsam poplar trees are most extensive and young saplings of these are mixed with sandbar willow near the river edge, and wolf willow further back. We tagged and measured hundreds of saplings to represent the full range of oil coatings on these three species. We found that the coating was initially oily and readily transferred with contact, and over the first two weeks became tacky, following evaporation.

By about four weeks, the coating changed to a chalky, dark material, due to oxidation. Both evaporation and oxidation would have been accelerated on the sapling surfaces since these are raised, increasing exposure to the sun and wind. Commencing around four weeks, heavily-coated leaves fell-off (abscised) and this resulted in stems with leafless bands that corresponded to the oil band, which initially resembled a 'bath-tub ring'. Over time, the staining on the stems and rock and gravel floodplain surfaces faded due to further oxidation, and by the end of the summer of 2012 many of the oil-spill zones were only slightly recognizable.

Our sequential measurements of the poplar and willow saplings indicated that those with heavy oil coatings grew more slowly over the summer, but these typically had new shoots emerge from the contaminated stems and also as suckers, new shoots emerging from the shallow roots. There was thus only a temporary set-back for the riparian vegetation.

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Photo comparison – The top photo displays a shoreline zone with balsam poplar saplings, which had been heavily coated with crude oil. Some of the material evaporated, especially over the first two weeks and the remaining material was oxidized over the summer. Consequently, by the end of the summer, only faded staining remained on the rocks and stems. Also note that even with complete oiling, the small saplings survived. For coordination, common rocks are numbered in red. (photos: Stewart Rood)

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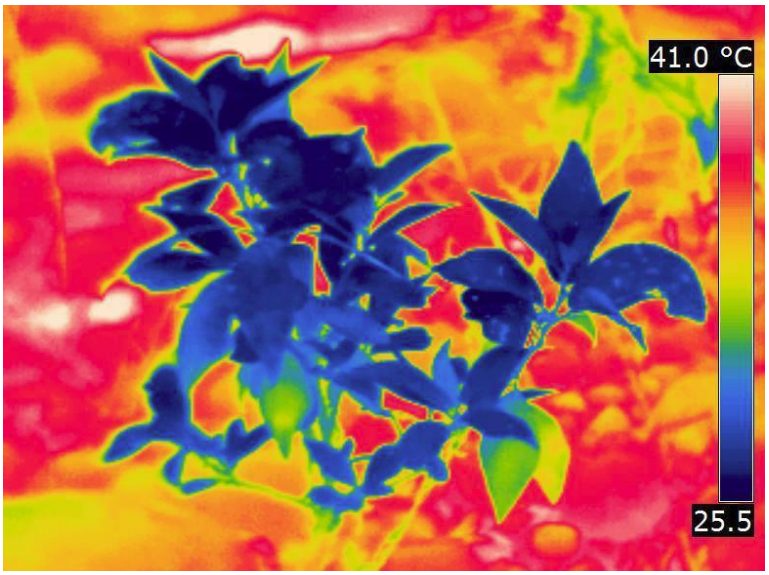
We also observed extensive establishment of new seedlings even on contaminated gravels and sands, and we also observed extensive sprouting from the roots in oil-coated river banks. We thus conclude that the oil was not overly toxic to the plants and while there was some inhibition because the oil coating blocked the transpiration of water and uptake of carbon dioxide, this was a temporary stress and the saplings were quite resilient, and able to rebound from the oiling.

This study will continue through 2013 to provide follow-up, and the results thus far indicate that the ecological impact from the oil spill was only temporary and less severe than some observers had predicted. Following from our study, we recommend that while heavily-contaminated vegetation should be removed, light or moderately coated vegetation may be best left in place. It would not only rebound fairly quickly, but leaving the sites undisturbed would avoid the hazard of introducing or promoting invasive plants such as reed canary grass, which may be the greatest current environmental threat to the Red Deer River floodplain. ♦

Thermal imaging – following the oil spill study, we undertook thermal imaging with an infrared camera. Here, a balsam poplar sapling is shown in an oil coated zone. The red areas reveal warm rocks and this warming from the sunshine would accelerate evaporation and oxidation. The sapling leaves are blue and cooler, partly due to evaporative cooling from the transpiration, or water vapour loss from the leaves. The lower leaves are warmer and hence green and yellow. These were oil-coated and the coating blocked transpiration. The oil spill thus provided us with an opportunity to observe the responses by the vegetation and investigate the underlying physiological processes. (photos: Evan Hillman)



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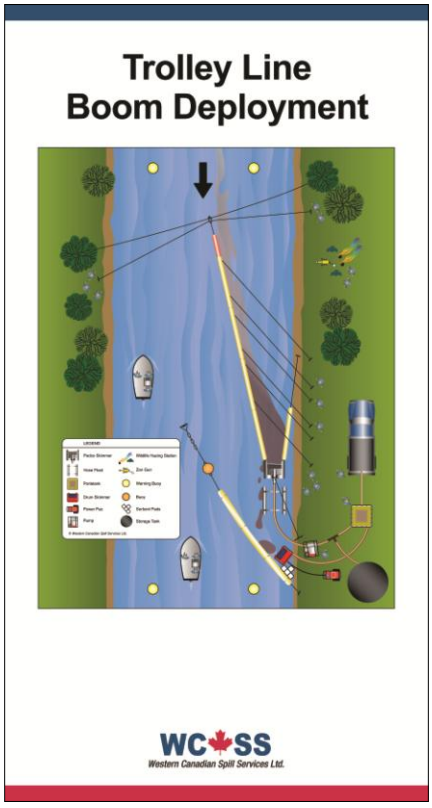
WCSS Equipment Deployment Charts

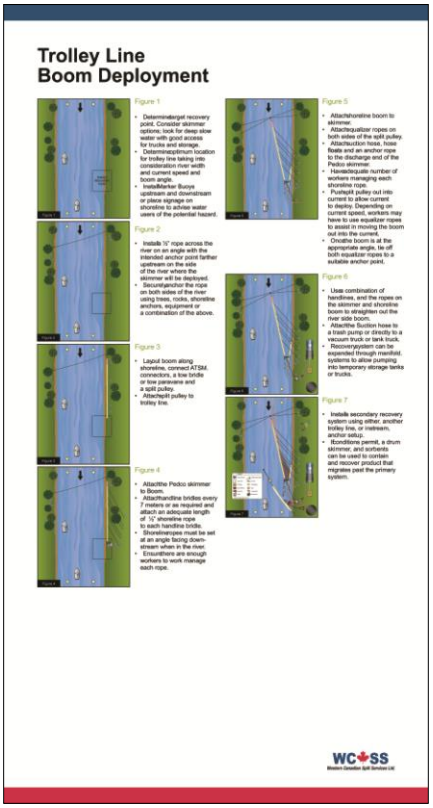
About 25 years ago somebody decided that a great training aid and/or equipment deployment guide for spill responders would be a set of vinyl banners illustrating all the steps that are required to anchor and deploy containment boom using a trolley line, bridge pier bridle and an in-stream anchor.

He or she was right; they served us well for many years but were starting to get hard to find, pretty beat-up and a little dated, so we've reworked the banners and think we're in pretty good shape for another couple of decades.

We have already had requests from some of our members for sets of the new banners so we decided to make them available to everyone; to order individual banners or the set of three go to our website www.wcss.ab.ca or call Leona at 403 516-8160.



Front



Back

Banners are approximately 2'x4' (60cm x 120cm), durable, two-sided, with heavy-duty stitching and metal grommets for easy display.

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The AMOP Seminar

The acronym, AMOP, stands for the Arctic (and) Marine Oilspill R&D Program, which has since become synonymous with the annual technical (R&D) oil spill technical seminar. The Seminar was an outgrowth of the R&D Program, which was initiated with funding from Environment Canada in 1976 in response to public concerns about the potential for oil spills from offshore oil drilling in the Beaufort Sea in the Canadian Arctic. Over the years, the acronym has lost its original meaning as the Seminar has become an international R&D forum. Today, less than 20% of the papers actually relate to the Arctic.

The first 'AMOP' Seminar was held in March, 1978 in Calgary, Alberta. Its purpose was to share the initial findings of the AMOP R&D Program among the 12 contractors and 8 Environment Canada project officers. Despite the focus and nature of this informal workshop, about 70 people attended. Many attendees expressed the need for such an annual meeting or conference to focus on oil spill R&D in northern environments. About 150 people attended the second seminar, held in Edmonton in March, 1979, and it became known as the 'AMOP Technical Seminar'. At this seminar, some time was set aside for presentations from people not associated with the AMOP program. After this time the seminar was simply kept going by persons wishing to present technical papers. Many international venues do not allow technical talks. This year marked the 36th year that the annual seminar was held. Environment Canada has always organized and managed the seminar.

The seminar has changed somewhat over the years and in 1999 the analogous chemical spill seminar was amalgamated into AMOP. Similar chemical counter-terrorism programs were included in 2005 and onwards. Technically the seminar is now known as "The AMOP Technical Seminar on Environmental Contamination and Response" but everyone knows it as 'AMOP'.

Since 1997, all papers published have been peer-reviewed, a move which, it is hoped, would promote peer review across the industry in general. The many volumes of past proceedings certainly constitute a good library of spill knowledge.

The venue is usually rotated between Edmonton, Calgary, Vancouver and more recently, Halifax. The 2014 seminar is planned to be in the Calgary area. The seminar has typically lasted 3 days with 2 or 3 simultaneous sessions. This includes about 80 or more talks. Each session focuses on a particular topic. The seminar still includes talks without papers in special sessions called 'speaker's corner'. A poster session and commercial show are always attached to AMOP. This has meant that AMOP is a place to meet those in the field as well as to give and hear technical talks.

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The purpose of AMOP has always been the exchange of information, particularly technical information.

An attendee views one of the many poster papers at a past AMOP seminar

This year's AMOP (the 36th) was held in Halifax and included the following sessions:

- Physical and Chemical Properties and Behavior of Oil Spills
- Oil Spill Modeling
- Special Session – Hazardous and Noxious Substances (HNS)
- Fate and Effects of Oil
- Detection, Tracking and Remote Sensing of Oil Spills
- Remediation, Restoration and Rehabilitation of Oil Spills
- Remediation, Restoration and Rehabilitation of Chemical and Hazardous Material Spills
- Chemical/Biological/Radiological/Nuclear/Explosive (CBRNE) Response
- Monitoring and Assessment of Chemical and Hazardous Material Spills
- Contingency Planning, Preparation and Prevention of Spills of Chemicals and Hazardous Materials
- Oil Spill Contingency Planning, Preparation and Prevention
- Response Technologies and Countermeasures for Oil Spills
- Case Histories and Recent Oil Spill Experiences
- Posters

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A few highlights of this year's AMOP are given below. Session chairmen volunteered information on the highlights of their sessions. One or two of the outstanding talks will be chosen and summarized in a few sentences. The authors will also be summarized in interests of space; sometimes these listings could be as long as the abstracts. This will summarize a few of the more than 85 presentations:

Physical and Chemical Properties and Behaviour of Oil Spills

Differentiation of oil sands samples - Environment Canada - New analytical methodology was presented to separate diverse samples containing oil sand materials or emissions from oil sands production. This will enable attribution to source after environmental sampling campaigns.

Summary of oil behavior in and with ice - Fingas and Hollebone - The current knowledge of the physical fate and behavior of oil in ice and snow conditions was reviewed. The algorithms and sub-models derived from studies were summarized. It was noted that most of these algorithms were developed in the 1970's and 1980's, and thus new work may be needed to verify these.

Avoiding false detections of crude oil and diesel by natural organic compounds (biogenic organic compounds or BOCs) - Kelly-Hooper and co-workers - New methodology was presented to distinguish natural compounds from diesel fuel or crude oil in environmental soil samples - a current problem.

Oil Spill Modeling

Influence of dispersant addition to the rise of oil droplets - CEDRE staff from France - An interesting paper showed that dispersant addition could change the appearance of oil droplets from spherical to elliptical, almost like that of a jelly fish. This effect also appears to slow the droplet rise to the surface.

Integration of oil spill models and data - Group of Portuguese Scientists - This was an interesting presentation which showed how various data sources such as current and weather information and oil spill models could be combined in one framework. This would provide a ready source of information and prediction capability in the case of a spill.

Alternative scenarios for the Prestige - French-McCay and colleagues - The Prestige developed problems off Spain and was refused refuge in Spanish ports. Instead the vessel proceeded north, spilling more oil and eventually was towed offshore and sank. Much oil was spilled and fouled much coastline. This paper evaluates alternative scenarios and shoreline impacts if the vessel was towed into port compared to those of the actual scenario. Towing the Prestige to any of the five identified ports of refuge would have eliminated >90% of the oil coming ashore on the north coast of Spain (i.e., east of Viveiro) and no significant shoreline oiling would have occurred on the coast of France.

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Detection, Tracking and Remote Sensing of Oil Spills

Detection of oil in and with Ice, Snow - Fingas and Brown - This was a review of the state-of-the-art in the field. A number of acoustic techniques have been tried in test tank situations and it was found that acoustic detection of oil was possible because oil behaves as a solid in acoustic terms and transmits shear waves whereas ice and water do not. Radio techniques such as ground penetrating radar are still being evaluated with variable results. A technique involving Nuclear Magnetic Resonance (NMR) is promising and is being studied as shown in the next paper summary.

Use of NMR to detect oil under ice - Palandro and colleagues - NMR could detect oil as it can detect hydrogen atoms and can distinguish these from hydrogen in oil and hydrogen in water. A prototype unit is being constructed. Because of the physics of NMR detection a large coil (about 4 to 8 metres) must be constructed. It is intended to suspend this under a helicopter in actual use. Testing continues.

Remediation, Restoration and Rehabilitation of Oil Spills

Burning oil in Ice - Buist and colleagues - Two studies were reported on, one a survey of the field and another the continuing study on the use of oil herders to thicken oil in ice for burning. The latter study has been going on for years and shows promise as a practical technique.

Burning on soil - Reardon and O'Donnell - This group conducted small scale tests and modeling to predict the heating of soil involved in burning of spills on land. A soil temperature of 60^{o}c or higher would constitute a hazard to plant life. Small scale tests show that these temperatures are typically not reached. Factors of importance include the time duration of the burn, moisture content and soil type. ♦

For further information on the AMOP seminar or to get on the regular list associated with this seminar contact SpillSeminars@ec.gc.ca

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Activity Report to June 30TH, 2013

May and June proved to be the two busiest months in terms of spills in the first half of WCSS's 2013. We provided oil spill containment and recovery equipment at 10 spills; it is also interesting to note that wildlife hazing equipment was deployed at 5 of the 10 spills and all 3 of WCSS's airboats were utilized.

Air Boat

WCSS's annual general meeting and strategic planning session was held on June 13th at Enform's Calgary Training Centre. The strategic planning workshop format was designed to capture lessons learned from a case study presentation of a high-profile oil spill in fresh water in Michigan, and to identify areas in WCSS's program where improvements could be considered. An operational plan that outlines actions that will be taken to enhance our current program is currently under development.

Wildlife Trailer

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Area H Small River Deployment Exercise in Leedale, AB May 29, 2013

To June 30th we have held 11 annual Cooperative training exercises, 3 open registration training sessions and 5 contract courses. WCSS was also busy giving awareness presentations in Ottawa, Vancouver, Toronto, Banff, Red Deer and Edmonton. WCSS also participated at trade shows in Brooks, Slave Lake and Bonnyville.

WCSS's spring equipment maintenance program has been completed; a new motor was installed on one of our Lethbridge workboats, and shelving is underway in the new Lloydminster OSCAR unit. The air curtain incinerator retrofit has been completed and a test burn is planned in the next few weeks.

Air Curtain Incinerator

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WCSS Training Schedule

There are 10 more Area Exercises left on our schedule:

Area	Date	Type
I/J	August 21	OSCAR in a Small River
W	September 4	OSCAR in a Small River
S	September 11	OSCAR in a Lake
G	September 11	OSCAR in a Small River
D	September 17	OSCAR in a Small River
M	September 18	Spill Responder (classroom)
T	September 18	Spill Responder (classroom)
Y	September 25	OSCAR in a Large River
N	October 2	OSCAR in a Lake
VR-1	November 6	Spill Responder (classroom)

WCSS member companies that missed an exercise in their area may attend any of the remaining exercises for the year – please contact the Administrator for each area to notify. Please note that the Directive 071 indicates that a licensee must attend an exercise in each area where there are operations. Please contact your Administrator for verification, or refer to your membership package.

WCSS Open Registration courses are intended to assist member companies with increasing their spill response knowledge and skill set. See below for training that is available at the Enform Nisku training centre for the remainder of 2013:

Date	Type
November 6	Spill Responder
November 7	Land Spill Response
November 8	Incident Commander at Oil Spills

All training courses are available on a contract in-house basis, subject to instructor and material availability. For more information, please contact Shannon Jarrell at (403) 516-8019, or shannon.jarrell@wcss.ab.ca.