Construction
Safety & Environ.
Plan (CSP & PL

2520-D-12-H

Chevron

Chevron Canada Resources
500 - Fifth Avenue S.W.
Calgary, Alberta T2P 0L7
Phone (403) 234-5000
Fax (403) 234-5666

Engineering Services

Construction Safety & Environment Plan

Chevron Fort Liard Area

K-29 Facility & Pipeline Project
Winter 2000

Book 3

1.0 Construction Contact List

Jan. 12, 2000

1999/2000 Fort Liard K-29 Facility & Pipeline Project

Company and Title	Name	Office	Cellular	Fax
CHEVRON				
Onsite:				
Logistics Coordinator	Jess Corbett	234-5196		
Facilities Coordinator	Bill Foster	234-5075		
Pipeline Coordinator	Terry Armstrong	234-5029	403-845-9170	
Electrical Inspector	Gary Fry/Merlynn Mantik	250-8007		
Instrumentation Inspector	Duncan Wilson	253-2777		
Fort Liard Operations				
Calgary:				
Manager, Field Tech. Services	Buddy Barnett	234-5051		234-5666
Design & Const. Coordinator	Russ Kear	234-5416		
Pipeline Coordinator	Ray Goodfellow	234-5425		
Facilities Coordinator	Brad Lock	234-5672		
Mechanical Design	Gary Schuster	234-5485		
Pipeline Design	Barry Tibbatts	234-5056		
Electrical Coordination	Peter O'Brien	234-5078		
Electrical Design	Jim McQuaker	250-8007		
Instrumentation Design	Marty Rutherford	234-5593		
Rotating Equipment Design	Jeff Stewart	234-5596		
Mechanical Drafting	Curtis Krouzel	234-5547		
Corrosion Representative	Ray Goodfellow	234-5425		
Operations Representative	Kevin Luft	780-660-2623		
Environmental Representative	Daryl Chollak	234-5781		
Safety Representative	Bob Tansowny	234-5813		
Joint Venture Representative	Maureen Yates-Dootka	234-5005		
Safety Contractor	Bear's Safety			
Onsite Safety Coordinator	Darcy Dedeluk	780-826-5300		
Environmental Contractor	Black Gold	250-923-6000		
Onsite Environmental Coord.	Ray Parfitt			
Mechanical Contractor	Quest	231-6000		
Onsite:	Mike Taylor			
	Rick Brimacombe			
Pipeline Contractor	Braidnor Construction	780-955-2551		
Onsite:	Pete Berzowski			
Electrical & Instrumentation Contractor	Syndicated Technologies	780-539-9696		
Onsite:	Peter Horelt			
Radiographer	Russel Technologies	780-469-4461		
Onsite:	Jim Yukes			
Civil Contractor	Beaver Enterprises	867-770-4571		
Onsite:	Doug Graham			
Natco Canada	Lee Rankel	203-2131		

Calgary Supervisory and Support Personnel			
Claims Coordinator Field Land Representative	Glenn Miller	Calgary	403-234-5399 (O) 403-946-5258 (H) 403-540-7491 (C)
Legal Officers	Mike Smith	Calgary	403-234-5322 (O) 403-270-4003 (H)
	Dick Pashelka	Calgary	403-234-5881 (O) 403-640-3900 (H)
Engineering Advisor Drilling & Engineering Services Manager	Buddy Barnett	Calgary	403-234-5051 (O) 403-249-0847 (H)
Drilling Superintendent	Al Cutt	Calgary	403-234-5008 (O) 403-547-6601 (H)
General Manager , Strategy People and Planning	Jim Causgrove	Calgary	403-234-5712 (O) 403-244-0507 (H)
Human Resources	Merle Gouldie	Calgary	403-234-5661 (O) 403-547-2598 (H)
Aviation Services Team Leader	Rene Lavoie	Calgary	403-571-5903 (O) 403-256-5912 (H) 403-804-6140 (C)
Aviation Assistant	Carrie Hucal	Calgary	403-571-5908 (O) 403-948-7658 (H) 403-515-7497 (P) 403-813-9919 (C)

5. National Energy Board (NEB) Also handle Occupational Health and Safety		
Calgary (Alternate fax # 403-292-5876)		403-292-4800 403-292-5503 (Fax)
Andy Graw	Conservation/Safety Officer	403-299-2790 (O) 403-547-3073 (H)
Chris Knoechel	Conservation/Safety Officer	403-299-3866 (O) 403-241-0047 (H)
Rick Turner	Operations Inspector	403-299-3868 (O) 403-257-0840 (H)
Bruce Moores	Environmental Specialist	403-299-3926 (O) 403-201-3765 (H)
John Koree	Environmental Specialist	403-299-6614 (O) 403-275-6256 (H)
Terry Baker	Chief Conservation Officer	403-299-2792 (O) 403-239-5032 (H)
John McCarthy	Chief Safety Officer	403-299-2766 (O) 403-240-2354H)
Rick Fisher		403-299-2798 (O) 403-220-0893 (H)

6. Transportation Department		
John Ganat	Fort Liard	867-770-3361
Rod Gunderson	Highway Superintendent	867-695-2478 (office)

7. Environmental Protection		
Forestry (Fires)		867-770-4311
Ross Hagen – Conservation Officer * will handle any fire, spill or wildlife concerns	Fort Liard	867-770-4311
Oil and Chemical Spills	Yellowknife	867-920-8130 (24hr)

8. Health and Social Services		
Mike Drake – Social Worker	Fort Liard	867-770-4301
John Morse – Medical Advisor	Yellowknife	867-920-8931
Lynn Morin – Nurse in Charge	Fort Liard	867-770-4301

9. Workers Compensation Board		
Rita Chamberlin	Yellowknife	867-920-3847

10. Fort Liard Band	
Fort Liard Band Office	867-770-4421 867-770-3555 (fax)
Harry Deneron – Chief	867-770-4141 (office) 867-770-4556 (home)

Natural Disaster — Rock Slide, Snow Avalanche, Earth Quake, etc.

Radio Channel #1 dedicated Construction Emergency Channel

STAGE 1 ALERT

- Any Hazard Identification for the potential of a Rock Slide or Snow Avalanche of happening

STAGE 1 ACTION PLAN

- everyone evacuate affected area to saf location
- foremen to account for all workers in area
- inform supervisor as per construction org. chart
- no one is to return to affected area until deemed safe by Chevron supervisor
- Chevron Supervisor to use all resources possible to ensure area is safe before allowing people back into the affected area

Situation Controlled? → Yes → **Stand Down**

No

STAGE 2 ALERT

- Where any Rock Slide, Snow Avalanche has occurred
- Any injuries
- Any fire
- Any environmental damage
- Any H_2S release

STAGE 2 ACTION PLAN

- Initiate First Aid ERP immediately
- Initiate Fire ERP immediately
- Initiate Environmental ERP immediately
- Initiate H_2S ERP immediately

Situation Controlled? → Yes → **Stand Down**

No

STAGE 3 ALERT

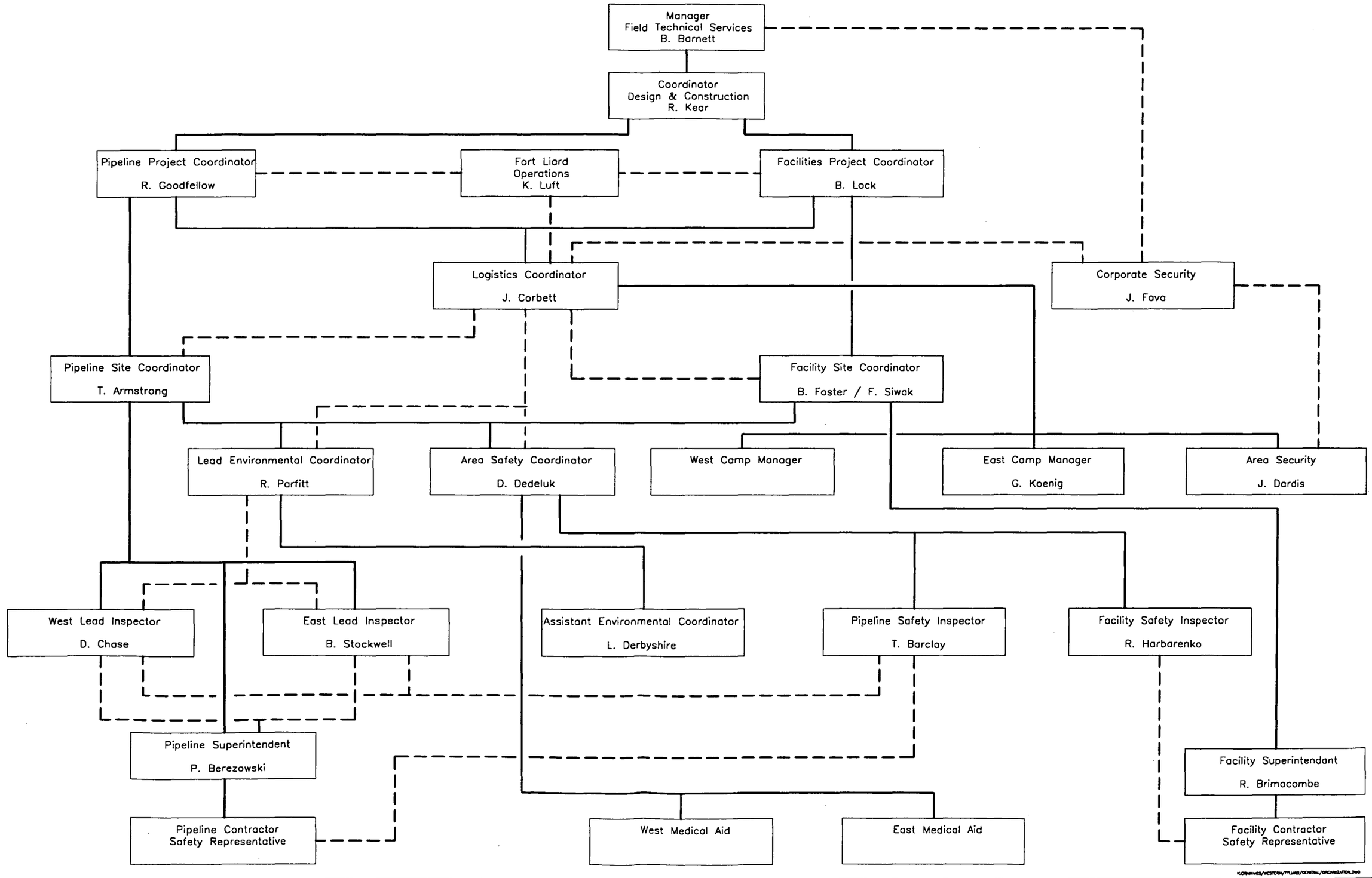
- Where any persons are missing

STAGE 3 ACTION PLAN

- Notify R.C.M.P, Local Fire, Chevron Management and all applicable Government Authorities

Ft.Liard Area Projects
Construction Safety & Environment Organization Chart

Jan. 12, 2000



Environmental Spill– Radio Channel #1 dedicated Construction Emergency Channel

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STAGE 1 ALERT ⟶ **STAGE 1 ACTION PLAN**

- Any small spill which can be controlled and cleaned up immediately.
- May be located at any Chevron facility, lease, row, camp or surrounding area.

- alert all effected personnel in area
- if safe to do so, isolate leak source immediately
- contain and clean up leak, dispose all contaminated material as per Chevron waste management plan.
- Inform Construction Environmental Coordinator.
- Initiate paper reporting as per Environmental plan 5.2.1 (Construction Safety & Environmental Plan)
- inform supervisor as per construction org. chart

↓

Situation Controlled? → **Yes** → **Stand Down**

↓

No

↓

STAGE 2 ALERT ⟶ **STAGE 2 ACTION PLAN**

- Any large or uncontrollable spill
- any injuries
- any fire

- initiate evacuation
  - ✓ sound alarm
  - ✓ all personnel shutdown equipment around them and muster to designated safe location
  - ✓ foremen account for all your workers and report to Chevron rep.
- Notify Chevron Operations to implement Operations ERP
- Initiate First Aid Injury ERP
- Initiate Fire ERP

1. Obtain and record the following information if possible:

   - Make of vehicle
   - Colour of vehicle
   - Vehicle licence plate number
   - Names, addresses and telephone numbers of vehicle occupants
   - Residence location (and map#), if occupants live within closed EPZ area
   - Next-Of-Kin of all occupants
   - Time that vehicle proceeded past the road block

2. Allow vehicle to pass.

3. Advise On-site Command Post and next road block location of passage of vehicle. Request command post notify RCMP

- Also record the time, occupants names and affiliation, and vehicle license plate number of all authorized vehicles entering or leaving the Closed Area. Advise On-Site Incident Command Post.

- Frequently monitor the air for H_2S (or SO_2 if well ignited). If H_2S levels exceed 15 ppm for 15 minutes (or SO_2 levels exceed 5 ppm for 15 minutes), inform the On-site Incident Command Post and move the road block back to a secure area.

Emergency Area Description (con't.)

Road access/conditions: _____

If a gas release, what equipment is near it? _____

Can you smell gas? Yes☐ No☐ If yes, from how far? _____

Can you hear it? Yes☐ No☐ If yes, from how far? _____

Can you see it? Yes☐ No☐ If yes, from how far? _____

Has H2S/HVP gas release been ignited? Yes ☐ No ☐

Have possible sources of ignition been extinguished? Facilities Yes ☐ No ☐
Resident Yes ☐ No ☐

Actions Taken To Control Release

Has source of emission been shut off? Yes ☐ No ☐

If No, can source be easily shut off? Yes ☐ No ☐

What is the spill migration potential? _____

_____

Action taken to control release/prevent spread of spill: _____

_____

_____

_____

Weather Conditions

Wind Direction: _____ Wind Speed: _____ km/hr Wind Gusts Yes ☐ No ☐

Other Weather Conditions (Specify): _____

_____

Other Contacts Caller Has Already Made

RCMP: _____ NEB: _____.

FIRE DEPARTMENT: _____ ENVIRONMENT: _____

AMBULANCE: _____ Others: _____

Information Taken By

Name: _____ Phone No. _____

Position: _____ Location: _____

AS SOON AS TIME PERMITS, PHONE OR FAX THIS INFORMATION TO:

1. Emergency Response command Personnel (i.e., Operations Section Chief, Incident Commander, Deputy Crisis Manager, etc.).
2. Communications and External Affairs.

SCHEDULE I/ANNEXE I
(SUBSECTION 16.4(3)/PARAGRAPHE 16.4(3))

HAZARDOUS OCCURRENCE INVESTIGATION REPORT

RAPPORT D'ENQUÊTE DE SITUATION HASARDEUSE

TYPE OF OCCURRENCE/GENRE DE SITUATION

☐ Fire / Explosion / Incendie / Explosion ☐ Death / Décès

☐ Disabling Injury / Blessure entraînant une invalidité ☐ Emergency Procedure / Procédures d'urgence

☐ Other / Autre _____ Specify/Préciser

Occurrence File No./N° de dossier de situation

Regional Office/Bureau régional

Employer ID No./Numéro d'identification de l'employeur

Employer Name and Mailing Address/Nom et adresse postale de l'employeur	Telephone Number/Numéro de téléphone	Operator / Exploitant
	Supervisor's Name/Nom du surveillant	
	Witnesses/Témoins	
Site of Hazardous Occurrence/Lieu de la situation hasardeuse	Weather/Conditions météorologiques	
ID of Drilling Rig, Drilling Unit, Production Facility, or Support Craft / Identification de l'appareil de forage, installation de forage, installation de production ou du véhicule de service		Date and Time of Hazardous Occurrence/ Date et heure de la situation hasardeuse

Description of what happened /Description des circonstances

Description and estimated cost of property damage / Description et coût estimatif des dommages matériels	Operation in progress / Opération en cours

Injured Employee's Name (if applicable)/Nom de l'employé blessé (s'il y a lieu)	Age/Âge	Occupation/Profession
		Years of experience in occupation/ Nombre d'années d'expérience dans la profession
Description of Injury/Description de la blessure	Sex/Sexe	Nationality / Nationalité
	Evacuation/ Évacuation	Direct cause of injury/Cause directe de la blessure

Was training in accident prevention given to injured employee in relation to duties performed at the time of the hazardous occurrence?
L'employé blessé a-t-il reçu un entraînement en prévention des accidents relativement aux fonctions qu'il exerçait au moment de la situation hasardeuse?

yes/oui ☐ no/non ☐ Specify/Préciser

[redacted]t causes of Hazardous Occurrence/Causes directes de la situation hasardeuse

Corrective action and date employer will implement/ Mesures correctives qui seront appliquées par l'employeur et date d'entrée en vigueur

Supplementary preventative measures/Autres mesures de prévention

Name of person investigating/Nom de la personne menant l'enquête	Signature/Signature	Date/Date
Title/Titre.	Telephone Number/Numéro de téléphone	
Safety & Health Committee Member or Representative's Name / Nom du membre du comité d'hygiène et de sécurité ou du représentant à l'hygiène et à la sécurité.	Signature/Signature	Date/Date
Title/Titre	Telephone Number/Numéro de téléphone	
Name of person representing the Operator / Nom de la personne représentant l'exploitant	Signature/Signature	Date/Date
[redacted]re	Telephone Number/Numéro de téléphone	

Lab/Trav 369 (Revised 7/87)

(Continue on reverse if needed / Continuer au verso si nécessaire)

COPIES 1 & 2 to R.S.O., COPY 3 to the Safety and Health Committee or Representative, COPY 4 to the Employer.
COPIES 1 et 2 à A.R.S., COPIE 3 au Comité d'hygiène et de sécurité ou au représentant, COPIE 4 à l'employeur.

FORT LIARD WASTE MANAGEMENT PLAN

CCR Operator Code: **Facility Waste Coordinato** Kevin Luft **Phone Number: 1-780-518-6172** **Fax Number: 1-403-660-2626** **Date** January 10, 2000

Facility Location: K29 Wellsite Dehydation Facility **NWT Waste Generator Number:** NTG000131 **Facility Code:**

24 Hour Contact Number: 1-403-234-5971

Waste Information				Generation/Storage		Transportation (TDG Information)				Treatment, Recycle or Disposal Information					Annual Waste Estimate
CCR Waste Name	DOW, NDOW Testing Required	Tracking Required	EUB Waste Code	Source Location	Storage Location	TDG Shipping Name	TDGA/PIN	TDG Class	TDG Packing Group	Common/Acceptable Disposal Methods (OWMR)	Recommended Disposal Method	Handling Code	Company	Location	Volume
Absorbents (Spent Socks, Pads)	NDOW (usually)	Yes	[oilabs]	Various dehydrator and field locations	E.W.M. bin or drums @ K29 wellsite	Waste environmentally hazardous substances, solid, nos* ( )	UN 3077	9.2	III	Reuse, landfil at class 1a,1b, or II, thermal treatment	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	50 kg
Acetic Acid (glacial spent)	DOW	YES	[acid]	Chemical flushes from vessels	400 bbl tanks @ K29 wellsite	Waste corrosive liquids, nos* ( )	UN 2789	9.2	II	Approved oilfield waste processing facility, inject down class 1 a/b , thermal treatment	Appropriate disposal well	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	Not an annual waste turnaround only
Activated Carbon (spent)	Testing Required	Yes	[actcrb]	Various plant and field - dehydrator (TEG contaminated)	E.W.M. bin or drums @ K29 wellsite	Waste environmentally hazardous substances, solid, nos* ( )	UN 3077	9.2	III	DOW: thermal treatment, NDOW: landfill class I or II, Both: reuse	Incinerate @ Swan Hills.	17	Bovar	Swan Hills	200 kg
Aerosol Cans	NDOW	No	[emtcon]	Various plant and field	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recycle if possible, ensure containers are empty and puncture	Recycle in Metal Bin	8	Chevron	Fort St. John B.C.	Minimal volume
Batteries: Alkaline	NDOW (dry) DOW (wet)	Yes (DOW)1 No (NDOW)	[Batt]	various plant and field - alkaline batteries from flashlights, etc.	E.W.M. bin or drums @ K29 wellsite	DOW: Waste batteries, wet, filled with alkali, electric storage	UN 2795	8	III	Landfil in approved landfill (if NDOW and dry)	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	10 kg
Batteries: Lead Acid	DOW	Yes	[Batt]	various plant and field - vehicle and equipment batteries	E.W.M. bin or drums @ K29 wellsite	Waste batteries, wet, filled with acid, electric storage	UN 2794	8	III	Recycle, remove free liquids & neutralize & landfill in approved class I or class II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	100 kg
Batteries: NiCd	NDOW (dry) DOW (if containing KOH)	Yes	[Batt]	various plant and field - radios and other rechargeable devices	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated (unless contains KOH)	n/a	n/a	n/a	Recycle, remove free liquids & neutralize & landfill in approved class I or class II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	n/a
Construction and Demolition Material - uncontaminated	NDOW	No	[conmat]	various plant and field (cardboard boxes)	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recycle, reuse, landfil in approved landfil	Incinerate @ K29 site	16	Chevron	K29 Dehydrator	Note ash estimate on the final row
Containers -pesticide/herbicide	NDOW (if rinsed)	No (NDOW)	[pstcon]	various plant and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated (if rinsed)	n/a	n/a	n/a	Recycle (pesticide container collection site); Rinse, crush, puncture and landfill at class 1a/b or II with a designated pesticide collection site	Incinerate @ Swan Hills.	17	Bovar	Swan Hills. AB	n/a
Contaminated Debris & Soil - Chemical Solvents	Testing Required	Yes	[solch]	various plant and field	Soil bin as required	Variable	Variable	Variable	Variable	Therm. treat, phys./chem. treat, land treat, landfil in Class I or II landfill	Case by case specific	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	n/a
Contaminated Debris & Soil - Crude Oil / Condensate	Testing Required	Yes	[solco]	various plant and field	Soil bin as required	Waste flammable solids, nos* ( )	UN 1325	4.1	II	Therm. treat, phys./chem. treat, land treat, landfill in Class I or II landfill	Case by case specific	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	n/a
Contaminated Debris & Soil - Produced/Salt Water	NDOW (unless contaminated with a DOW)	Yes	[solpw]	various plant and field	Soil bin as required	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	If onsite treat not possible, excavate and dispose at appropriate landfill	Case by case specific	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	n/a
Corrosion Inhibited Water	DOW	Yes	[connh]	various plant and field	Waste storage tank at K29 wellsite	Waste flammable liquids nos* ( )	UN 1993	3	II	Inject down class 1a/1b disposal well (dependent on metals)	Appropriate disposal well	5	Chevron	Fort St. John BC LSD 15-5-83-17 W6M	50 M^3

Waste Information				Generation/Storage		Transportation (TDG Information)				Treatment, Recycle or Disposal Information					Annual Waste Estimate
	DOW, NDOW	Tracking	EUB Waste						TDG Packing	Common/Acceptable	Recommended Disposal	Handling			
CCR Waste Name	Testing Required	Required	Code	Source Location	Storage Location	TDG Shipping Name	TDGA/PIN	TDG Class	Group	Disposal Methods (OWMR)	Method	Code	Company	Location	Volume
Crude Oil / Condensate Emulsions	Testing Required	Yes	[coemul]	various plant and field (wellbores)	Waste storage tank at K29 wellsite	Waste flammable liquids nos* ( )	UN 1993	3	II	Approved oilfield waste processing facility, inject down class 1 a/b , thermal treatment	Appropriate disposal well	16	Chevron	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [3]
Crude Oil Sample Bottles	NDOW	No	[emtcon]	various plant and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	Reuse; Recycle; Rinse and landfill at Class 1 a/b, II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	This waste is not anticipated at this facility [3]
Desiccants - spent (all types)	NDOW (usually - instrument air)	Yes	[desact]	Various Plant - instrument air	Warehouse	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	DOW: property contain & landfill Class I a/b landfill, NDOW: reuse, recycle, properly contain landfill in I a/b or II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	10 kg
Domestic Sewage Effluent	NDOW	No	n/a	Battery	Septic tank	Not TDG regulated	n/a	n/a	n/a		Irrigated	N/A	n/a	n/a	180 M^3
Domestic Sewage Sludge	NDOW	No	n/a	Battery	Septic tank	Not TDG regulated	n/a	n/a	n/a			N/A			Not an annual waste
Empty Containers (metal and plastic including drums, pails, jugs, etc.) - (Refundable)	NDOW (usually)	No	[emtcon]	Various plant and field	Barrel dock @ K29 wellsite	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	Return to supplier; Recycle, Rinse, crush & landfill in class I a/b or II landfill	Return to Supplier	16	various	various	n/a
Empty Containers (metal and plastic including drums, pails, jugs, etc.) - (Non-refundable)	NDOW (usually)	No	[emtcon]	Various plant and field	Barrel dock @ K29 wellsite	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	Return to supplier; Recycle, Rinse, crush & landfill in class I a/b or II landfill	Metal - rinsed, crushed & recycled. Plastic - rinsed & incinerated	16	various	various	Minimal volume
Filters - Glycols (EG/TEG)	DOW	Yes	[filgly]	Battery - dehydrator (TEG)	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	Recycle (metal recovery), Thermal treatment, remove entrained liq., contain & landfill in Class I a/b landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	25 kg
Filters - Lube Oil	DOW (undrained) NDOW (drained)	Yes	[fillub]	Battery - compressors, water pumps	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated, if drained. Waste type 201, if undrained	NA 9500	9.3	III	Recycle (metal recovery), Thermal treatment, drain liquids & landfill in Class I a/b landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	20 kg
Filters- Other (instrument air.)	DOW (gas, NGL)	Yes	[filoth]	Instrument air compressors.	Garbage bin @ K29 wellsite	Waste filter uncontaminated with flammable liquids	UN 1993	3.3	I	Recycle (metal recovery), Thermal treatment, remove entrained liq., contain & landfill in Class I a/b landfill	EWM waste bin	8	EWM	Swan Hills AB.	n/a
Filters - Water Treatment	NDOW	Yes	[filwtt]	n/a	n/a	Not TDG regulated	n/a	n/a	n/a	NDOW; landfill at class I a/b or II landfill	n/a	N/A	n/a	n/a	n/a
Fluorescent Tubes: Spent	NDOW	No	[domwst]	M.C.C. / Control room	Mark and store in original container @ K29 wellsite	TDG regulated	n/a	n/a	n/a	Recycle	Recycle	8	Chevron	K29 Dehydrator	
Garbage - domestic waste	NDOW	No	[domwst]	Control room / house.	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	landfill in approved landfill, class Ia, Ib, II or III	Incinerate and landfill ash	8	Chevron	K29 Dehydrator	Note ash estimate on the final row
Gaskets	NDOW	No	[domwst]	Battery and field locations	Garbage bin @ K29 wellsite	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	Landfill in approved landfill, class Ia, Ib, II or III	Metal recycle or incinerate	8	Chevron	K29 Dehydrator	Note ash estimate on the final row
Glycol Solutions (EG/TEG) - (heavy metals)	DOW	Yes	[glychm]	Battery - dehydrator (TEG)	Remains in Process	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	DOW or NDOW: recycle, inject in disp. well Class I or II, thermal treat.	Inject to appropriate well or recycle	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [3]
Glycol Solutions (EG/TEG) - (no heavy metals)	Testing Required	Yes	[glyc]	Battery - dehydrator (TEG)	Remains in Process	TDG regulated in NWT	NA 9500	9.3	III	DOW or NDOW: recycle, inject in disp. well Class I or II, thermal treat.	Inject to appropriate well or recycle	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	2 M3 per year
Grease Cartridges	NDOW	No	[emtcon]	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Landfill in an approved Class I a/b, II landfill.	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	5 kg
Hydraulic and Transmission Oil (vehicle and equipment)	NDOW (usually)	Yes	[hydoil]	Various: battery and field	Storage containers in warehouse	Waste Type 201 TDG regulated	NA 9500	9.3	III	Recycle (licensed), thermal treatment	Recycle	15	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	n/a

Waste Information				Generation/Storage		Transportation (TDG Information)				Treatment, Recycle or Disposal Information					Annual Waste Estimate
CCR Waste Name	DOW, NDOW Testing Required	Tracking Required	EUB Waste Code	Source Location	Storage Location	TDG Shipping Name	TDGA/PIN	TDG Class	TDG Packing Group	Common/Acceptable Disposal Methods (OWMR)	Recommended Disposal Method	Handling Code	Company	Location	Volume
Insulation - non asbestos	NDOW	No	[conmat]	Various: battery and field	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	NDOW: approved landfill	Landfill large volumes through EWM or Newalta	8	Chevron		This waste is not anticipated at this facility [3]
Lab Chemicals - Organic	DOW	Yes	[orgchm]	Various Plant and Field (varsol)	Lab drain tank	Waste flammable liquids nos* (naphtha petroleum)	UN 1993	3	II	Reuse, recycle, thermal treatment	Recycle	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility
Liquids - Turnaround Wastes	DOW/NDOW	Yes	[coemul]	Various Plant and Field (varsol)	n/a	Waste flammable liquids, nos* ( )	UN 1993	3	I	Approved oilfield waste processing facility, inject class 1a or 1b, thermal treatment	Recycled; Well disposal	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	Not an annual waste turnaround only
Office Material (paper)	NDOW	No	[domwst]	Control room	Control room	Not TDG regulated	n/a	n/a	n/a	Recycle or landfill in approved landfill	Recycle or incinerate	16	Chevron		100 kg
Paint Cans (empty) and Brushes	NDOW	No	[emtcon]	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Landfill in an approved Class I a/b, II landfill.	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	This waste is not anticipated at this facility [9]
Pigs (used)	NDOW	No	[wstmis]	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recycle, landfill at class I a/b or II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	500 kg
Pesticides/Herbicides Spent	DOW	Yes	[psthrb]	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Waste herbicides, liquids, toxic, nos* ( )	UN 2902	6.1	III	Waste exchange, thermal treatment, approved toxic roundup	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	n/a
Photo Copier / Laser Printer Toner	NDOW	No	[domwst]	Photo Copier / Fax machine	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recycle, approved landfill class Ia, Ib, II or III	Recycle to manufacturer	8	Chevron		3 cartridges
Pigging Waste - Liquids	DOW (usually)	Yes	[pigwst]	Pipelines	Waste storage tank at K29 wellsite	Waste flammable liquids, nos* ( )	UN 1993	3.3	I	Recovery (hydrocarbon), thermal treatment	Recycle to Oilfield recycler	16	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [9]
Pigging Waste - Wax and solids	DOW (usually)	Yes	[pigwst]	Pipelines	Newalta bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recovery (hydrocarbon), thermal treatment	Thermal treatment or appropriate landfill	15	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [9]
Pipe Dope Containers and Brushes	NDOW (if empty and dry)	No	[emtcon]	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	DOW or NDOW: return to supplier, recycle, rinse & landfill in class I a/b, II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	10 kg
Pipe Dope/Greases - Lead Based	DOW	Yes	[lddope]	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Leachable toxic waste (L17)	UN 9500	9.3	III	Recycle, thermal treatment, landfill at class Ia or Ib	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	0
Pipe Dope/Grease - Non lead Based	NDOW	Yes	[wstmis]	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recycle, thermal treatment, landfill at class Ia or Ib	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	10 kg
Pipe sleeves	NDOW	No		Pipeline construction	K29 site	Not TDG regulated	n/a	n/a	n/a	landfill in approved landfill, class Ia, Ib, II or III	Incinerate and landfill ash		Pipeline contractor		Note ash estimate on the final row
Plant Surface Runoff - contaminated	Yes (DOW) [4]	No (unless contaminated with a DOW)	n/a	Various: battery and field	N/A	Not TDG regulated	n/a	n/a	n/a	Inject down class 1a/1b disposal well depending on pH.	Inject to Class I a/b disposal well	4	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	None
Plant Surface Runoff - uncontaminated	NDOW	No	n/a	Various: battery and field	On locations	Not TDG regulated	n/a	n/a	n/a	Inject down class 1a/1b disposal well depending on pH or test and release	Test pH & Chlorides and release	N/A	Chevron	various	Annual rainfall accumulation
Process Wastewater (floor drains, building drains, oily water sewers, etc.) (with heavy metals)	Testing Required	Yes[5]	[pwtrhm]	Equipment washings	n/a	Not TDG regulated (unless contaminated with a DOW)	n/a	n/a	n/a	Inject down class 1a/1b disposal well depending on pH and if metal content < G51 criteria	Inject to appropriate disposal well	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	None
Process Wastewater (floor drains, building drains, oily water sewers, etc.) (with organic chemicals)	Testing Required	Yes5	[pwtror]	Equipment washings	n/a	Not TDG regulated (unless contaminated with a DOW)	n/a	n/a	n/a	Inject down class 1a/1b disposal well depending on pH.	Inject to appropriate disposal well	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	5 M^3
Produced Water	NDOW (unless contaminated with a DOW)	No (NDOW)	[water]	Various: battery and field	Waste storage tank at K29 wellsite	Not TDG regulated (unless contaminated with a DOW)	n/a	n/a	n/a	Inject down Class I or II disp. well	Inject to appropriate disposal well	4	Chevron	Chevron O80 injection well	25000 M^3 Annual production estimate

Waste Information				Generation/Storage		Transportation (TDG Information)				Treatment, Recycle or Disposal Information					Annual Waste Estimate
	DOW, NDOW	Tracking	EUB Waste						TDG Packing	Common/Acceptable	Recommended Disposal	Handling			
CCR Waste Name	Testing Required	Required	Code	Source Location	Storage Location	TDG Shipping Name	TDGA/PIN	TDG Class	Group	Disposal Methods (OWMR)	Method	Code	Company	Location	Volume
Rags - Oily	NDOW (usually)	No (NDOW)	[oilrag]	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Waste flammable solids, nos* ( )	UN 1325	4.1	II	DOW: thermal treatment, NDOW: reuse (launder/dry clean), landfill class I or II	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	50 kg
Scrap Metal (Galvanized, Aluminum, Stainless Steel, etc.)	NDOW	No	[smetal]	Various: battery and field	n/a	Not TDG regulated	n/a	n/a	n/a	DOW: decontam. & recycle, landfill Class I a/b landfill NDOW: recycle, landfil in class I a/b, II or III landfill	Recycle	16			1000 kg
Sludge - Glycol (TEG/EG), Gas Drying Systems	DOW	Yes	[slggly]	Battery - dehydrator (TEG)	Left in Process	Waste solids containing flammable liquids, nos* ( )	UN 3175	4.1	II	phys./chem. treat., land treat., thermal treat., inject Class I a/b disp. well (glycol < 40 %)	Recovery, thermal treatment	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [9]
Sludge - Hydrocarbon (tanks, treaters, separators, ponds, flare, etc.)	Testing Required	Yes	[slghyd]	Battery - flare KO, inlet separator, slop oil tank, production tanks	Left in Process	Waste solids containing flammable liquids, nos* ( )	UN 3175	4.1	II	Oilfield waste processing facility; thermal treatment; Class I a/b, II landfill	Recovery, thermal treatment	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	Not an annual waste turnaround only
Solvents - spent	DOW	Yes	[solalp]	Various Plant and Field (varsol)	Storage containers in warehouse	Waste flammable liquids, nos* (naphth petroleum)	UN 1993	3	II	Recycle (licensed), thermal treatment	Recycle	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	200 liters
Thread Protectors (Metal & Plastic)	NDOW	No	[thprot]	Various: battery and field	Warehouse K29 site	Not TDG regulated	n/a	n/a	n/a	Reuse, recycle, landfil at class 1a,1b,II, or III	Recycle	16	Various Suplers	various	This waste is not anticipated at this facility [9]
Used Lubricating Oil	NDOW (usually)	Yes	[luboil]	Battery - compressors, water pumps	Used lube oil tank	Waste Type 201	NA 9500	9.3	III	recycle (licensed), thermal treatment	Recycle	15	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	4 M^3
Wash Fluids (process areas, vessels, other)	Testing Required	No (NDOW)	[wshorg]	Various: battery and field	n/a	Not TDG regulated (unless contaminated with a DOW)	n/a	n/a	n/a	Recycle, recover HC and inject down Ia or Ib disposal well	Inject to Class Ib disposal well	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	Not an annual waste turnaround only
Wash Fluids - equipment cleaning operations	Testing Required	No (NDOW)	[wshorg]	Various: battery and field	n/a	Not TDG regulated (unless contaminated with a DOW)	n/a	n/a	n/a	Recycle, recover HC and inject down Ia or Ib disposal well	Inject to Class Ib disposal well	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	Not an annual waste turnaround only
Wash Fluids - uncontaminated (water)	NDOW	No	[wshwtr]	Various Plant and Field - equipment washing/floor drains	n/a	Not TDG regulated	n/a	n/a	n/a	Recycle, recover HC and inject down Ia or Ib disposal well	Inject to Class Ib disposal well	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	2 M^3
Welding rods	NDOW	No		Construction of facilities	Warehouse K29 site	Not TDG regulated	n/a	n/a	n/a	Approved landfill class Ia, Ib, II or III	Determine volume and landfill as appropriate. Determine landfill requirements for large volumes				0.2 M^3
Well Workover Fluids (spent acid, HC, etc.)	Testing Required	Yes	[wwofld]	Various: battery and field	Various: battery and field	Waste corrosive liquids, nos* ( )	UN 1760	8 (9.2)	II	Inject down Ia (pH 4.5-12.5) or Ib (pH 6.0-9.0) disposal well	Inject down appropriate well	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [9]
X-ray film - unused and spent	NDOW (usually)	No (NDOW)	[wstmsl]	Various: battery and field	Warehouse K29 site	Not TDG regulated	n/a	n/a	n/a		Store for 3 years , landfill in approved.	8	Chevron	K29 Dehydrator	Not an annual waste
Incinerator ash	NDOW	No (NDOW)	[wstmsl]	K29 Dehydrator site domestic waste incineration	K29 site	Not TDG regulated	n/a	n/a	n/a		Landfill in approved landfill.		Chevron	FL Liard	5.5 M^3

Notes

1. Tracking is required if battery is wet, alkali filled. Dry batteries are excluded.
2. Tracking is not required unless the construction material is contaminated with a DOW.
3. Incinerator ash must be tracked if the incinerated material is reportable.
4. Plant surface runoff does not need to be tracked unless the runoff is contaminated with a DOW. Fill in release analysis forms.
5. Process wastewater will normally be tracked as it will contaminated with organics, chemicals or metals.
6. Salt bath medium is not trackable as long as it is a NDOW.
7. Sand blasting sand is not trackable as long as it is not contaminated with a DOW.
8. Not trackable unless contaminated with a DOW.
9. This waste is not anticipated, however it remains in the waste management system in to assist in tracking in theevent it does occur

Note: If there is any question regarding the appropriate TDG shipping name, PIN, Class or Packing Group, consult the Transportation of Dangerous Goods Act and Regulations.

Memo

To: All Contractors

From: Brad Lock

cc: Operations

Date: December 6, 1999

Re: Fort Liard Area Projects – Construction Safety and Environment Plan

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Attached is the Chevron Construction Safety and Environment Plan for the Fort Liard area projects planned for the 1999/2000 winter construction season. Chevron expects all contractors and their sub-contractors to comply with this plan. Please review this plan with your field supervisory personnel.

Contractor Distribution:
Mechanical Contractor
Electrical Contractor
Instrumentation Contractor
Civil Contractor
Engineering Contractors - Mech., Elect., Instr.
Inspection Contractors – Mech., Elect., Instr., Envir.
Safety Contractor
Chevron On-site Representative
Sub Contractors

Construction Safety and Environment Plan
Chevron Fort Liard Area Projects

1.0 Project Contact List

2.0 Roles and Responsibilities

Project Coordinator(s)
Chevron Site Coordinator(s)
Chevron Environmental Coordinator
Chevron Area Safety Coordinator
Chevron Pipeline Safety Inspector
Chevron Facility Safety Inspector
Contractor's Superintendent
Contractor Safety Representatives
Contractor's Workers
Chevron Fort Liard Operations
Organization Chart
RACI Diagram

3.0 Emergency Response Information

Introduction
Area Description
Incident Command Post
Emergency Operations Centre
Emergency Contact List
First Aid Injury
Fire
Motor Vehicle Accident / Equipment Damage
H2S Release
Natural Disaster
GPS Locations & Map
Road Block Procedures
Critical Incident Stress Debriefing
Information Data Sheets

4.0 General Safety

Safe Work Practices
Certification
Personal Protective Equipment Requirements
Safety Meetings
Incident Reporting
Safety Performance Incentives

General Safety (continued)

Site Orientation for New Workers
Work Permits
WHMIS/MSDS
Driving
Communications
Drugs and Alcohol
Pre-Job Meeting Checklist

5.0 Environment

General Measures
Pipeline Construction
- Incident Reporting, Waste Management and Hazardous Material
- Wildlife Protection
- Wetlands and Watercourse Crossings
- Timber Clearing
- Stripping
- Grading
- Ditching, Pipe Installation and Backfilling
- Testing
- Clean-up
- Revegetation
- Camp Operation

Wellsite Facilities
- Incident Reporting, Waste Management and Hazardous Materials
- Site Clearing and Grading

Detailed Incident Report
Chevron Release
Waste Management Plan

6.0 Safe Work Practices

Safe Driving
Fall Prevention
Critical Lifts
Backhoe pile driving
Hot Work
Pipeline Crossing

1.0 Construction Contact List

Dec. 6, 1999

1999/2000 Fort Liard K-29 Facility & Pipeline Project (update prior to construction)

Company and Title	Name	Office	Cellular	Fax
CHEVRON				
Onsite:				
Logistics Coordinator	Jess Corbett	234-5196		
Facilities Coordinator	Bill Foster	234-5075		
Pipeline Coordinator	Barry Tibbatts	234-5056		
Electrical Inspector	Gary Fry			
Instrumentation Inspector	Duncan Wilson			
Fort Liard Operations				
Calgary:				
Manager, Field Tech. Services	Buddy Barnett	234-5051		234-5666
Design & Const. Coordinator	Russ Kear	234-5416		
Pipeline Coordinator	Brent Naherny	234-5405		
Facilities Coordinator	Brad Lock	234-5672		
Mechanical Design	Gary Schuster	234-5485		
Pipeline Design	Barry Tibbatts	234-5056		
Electrical Coordination	Peter O'Brien	234-5078		
Electrical Design	Jim McQuaker	250-8007		
Instrumentation Design	Marty Rutherford	234-5593		
Rotating Equipment Design	Jeff Stewart	234-5596		
Mechanical Drafting	Curtis Krouzel	234-5547		
Corrosion Representative	Ray Goodfellow	234-5425		
Operations Representative	Kevin Luft	780-660-2623		
Environmental Representative	Daryl Chollak	234-5781		
Safety Representative	Bob Tansowny	234-5813		
Joint Venture Representative	Maureen Yates-Dootka	234-5005		
Safety Contractor	Bear's Safety			
Onsite Safety Coordinator	Darcy Dedeluk	780-826-5300		
Environmental Contractor	Black Gold	780-778-2391		
Onsite Environmental Coord.	Larry Derbyshire			
Mechanical Contractor				
Onsite:				
Pipeline Contractor				
Onsite:				
Electrical Contractor	Syndicated Technologies			
Onsite:				
Instrumentation Contractor	G & S Instrument Services			
Onsite:				
Radiographer				
Onsite:				
Civil Contractor	Beaver Enterprises			
Onsite:				
Natco Canada	Lee Rankel	203-2131		

2.0 Roles & Responsibilities – Construction Phase Safety & Environment

Project Coordinator(s)

1. Represent Chevron as the Prime Contractor for this project,
2. Ensure Contractors have appropriate health, safety and environmental programs in place and have designated qualified site personnel responsible for their health, safety and environmental programs,
3. Development of the Safety and Environment Plan for construction phase of the Fort Liard area projects,
4. Demonstrate Chevron's commitment to safe performance of the construction phase of the project by following up on issues and incidents as required,
5. Ensure that the requirements of the Construction Safety and Environment Plan are carried out by all personnel on the construction site by providing necessary resources to ensure compliance and to carry out periodic audits to verify compliance with the Construction Safety and Environment Plan.

Chevron Site Coordinator(s)

1. Ensure that the OH&S regulations are complied with at the work site,
2. Communicate and implement the requirements of the Construction Safety and Environment Plan to all Contractors working at the construction site. Authorized to halt a construction activity if not in compliance,
3. Ensure Contractors fully understand Chevron's expectations for the implementation of safe work practices and environmental protection practices,
4. Provide guidance to the Area Safety Coordinator & Inspectors as well as the Lead Environmental Coordinator as required,
5. Coordinate behavioral safety program with Contractors,
6. Seek guidance from Project Coordinator(s) on safety and environmental issues as required,
7. Address in a timely manner any safety or environmental concerns, including incidents, that have been identified and raised by Contractors working on the site.

Chevron Environmental Coordinator

1. Ensure that environmental mitigation and reclamation measures contained within the contract documents are implemented. Assess the effectiveness of these measures to achieve results,
2. Ensure that the conditions of permits and approvals & all Chevron environmental policies and commitments, are met,
3. Coordinate work with Chevron's Site Coordinator(s) to assist them to interpret and implement environmental concerns in a timely manner,
4. Maintain regular liaison with appropriate government agencies and compile a record of contacts,
5. Prepare daily reports and the final Environmental As-Built Report,
6. Report all incidents to the Project Coordinator(s) verbally immediately after initial response and provide a written report within 48 hours,
7. Advise the Contractors in consultation with the appropriate government agencies and Chevron's Environmental Representative on a course of action in the event that an unforeseen environmental issue arises,
8. Participate in any required liaison with stakeholders during construction.

Chevron Area Safety Coordinator

1. Work with Fort Liard Operations to implement the area CERP,
2. Develop medical response plan for construction activities,
3. Oversee all safety related concerns and activities in a timely manner,
4. Report all incidents to the Site Coordinator(s) verbally immediately after initial response and provide a written report within 48 hours,
5. Assist with medical response to construction activities,
6. Maintain safety performance records and construction hours worked,
7. Coordinate site investigation of any construction incidents,
8. Ensure Chevron work site orientations are performed for all personnel working on Fort Liard area projects,
9. Ensure weekly safety meetings are scheduled and conducted with all contracting companies.

Chevron Pipeline Safety Inspector

1. Ensure Contractor safety plan is implemented,
2. Respond and assist to construction site incidents,
3. Predict and mitigate potential safety hazards before they occur,
4. Identify and communicate all safety concerns, including all incidents, to the Area Safety Coordinator,
5. Work together with the Contractor Safety Representative to satisfactorily resolve all safety concerns in a timely manner,
6. Perform and document job site inspections,
7. Monitor daily work plan for all pipeline work,
8. Support the Construction Safety and Environment Plan by assisting Contractors as requested by the Contractors and as directed by Chevron's Site Coordinator.

Chevron Facility Safety Inspector

1. Ensure Contractor safety plan is implemented,
2. Respond and assist to construction site incidents,
3. Predict and mitigate potential safety hazards before they occur,
4. Identify and communicate all safety concerns, including all incidents, to the Area Safety Coordinator,
5. Work together with the Contractor Safety Representative to satisfactorily resolve all safety concerns in a timely manner,
6. Perform and document job site inspections,
7. Generate daily work permits for all work on the facility construction site,
8. Work with all personnel to institute behavioral safety program,
9. Support the Construction Safety and Environment Plan by assisting Contractors as requested by the Contractors and as directed by Chevron's Site Coordinator,
10. Provide the equipment and expertise for the daily safety checks for the facility construction site to verify safe work conditions,
11. Perform work site orientations for all personnel working on facility construction site.

Contractors' Superintendent

1. Ensure that the workers under his control comply with the OH&S regulations,
2. Direct the activities of employees involved in the work,
3. Ensure that all employees (including subcontractors) under his control perform their work in a safe manner by adherence to the Construction Safety and Environment Plan,
4. Identify and communicate safety and environmental concerns to the Chevron Lead Inspector or Site Coordinator at the construction site & work to satisfactorily resolve all concerns in a timely manner,
5. Co-ordinate the daily work plan meeting with the Chevron Facility Safety Inspector to generate the necessary work permits for the following day,
6. Pipeline Superintendent to ensure tail gate meetings & plans are documented and forwarded to the Chevron Pipeline Safety Inspectors on a daily basis,
7. Schedule and coordinate weekly safety meetings with contracting crews. Inform Site Coordinator of the time and date so they can attend and add input.

Contractor Safety Representatives

1. Ensure that all Contractors' employees (including subcontractors) perform their work in a safe manner by adherence to Construction Safety and Environment Plan and the Contractor's safety program,
2. Identify and communicate safety concerns to the Chevron Safety Inspector(s) at the construction site and work together to satisfactorily resolve all safety concerns in a timely manner,
3. Ensure that all Contractor's employees (including subcontractors) are supplied with the required PPE,
4. Perform Contractor's safety orientation as required,
5. Provide medical response to construction site activities.

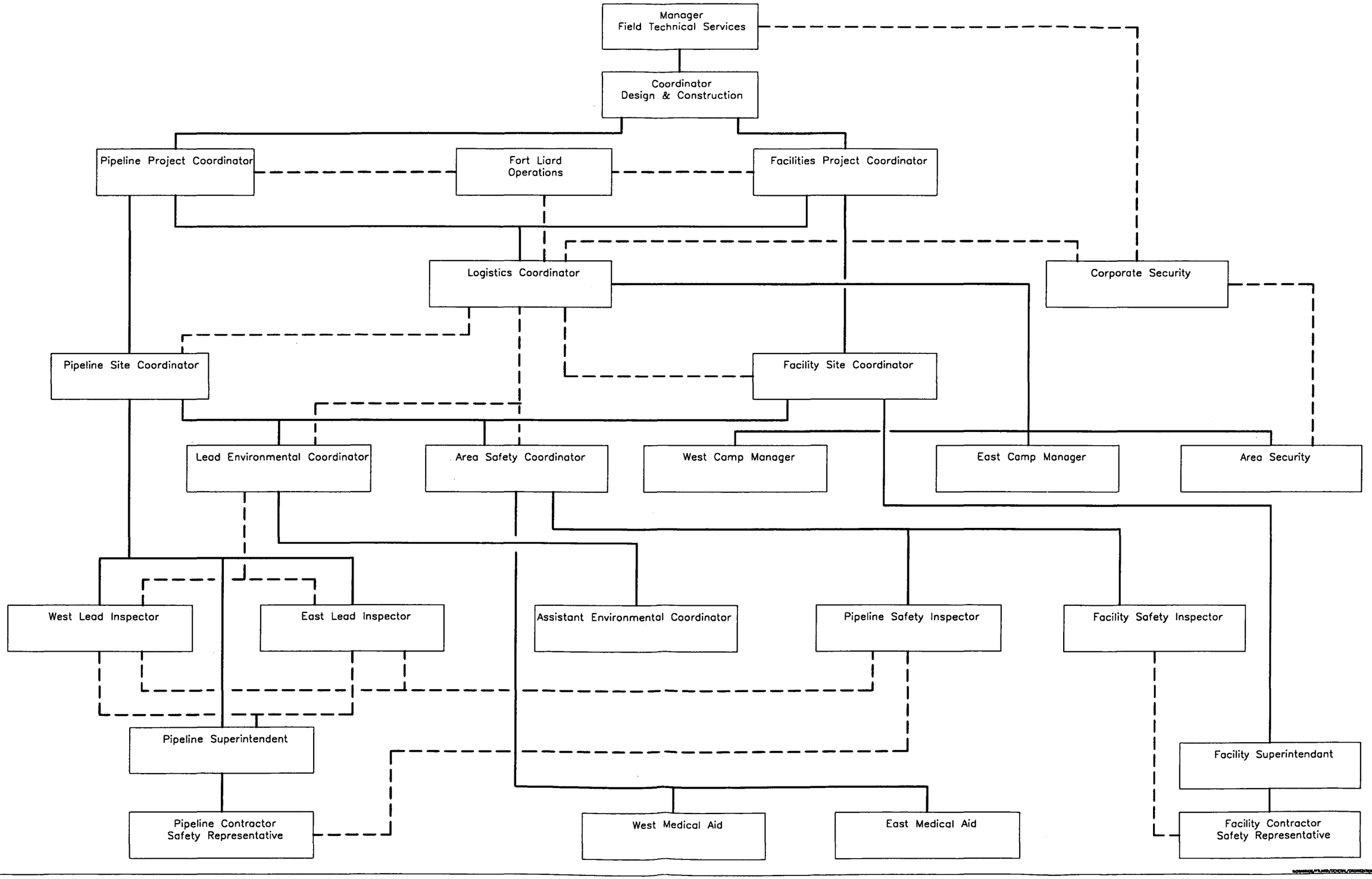
Contractor's Workers

1. Be familiar with the requirements of the Construction Safety and Environment Plan and perform all tasks in accordance with the plan,
2. Take reasonable care to protect himself, other workers present while he is working and other workers present at the site but not directly involved in the work,
3. Identify and communicate any safety and environmental concerns related to tasks he is to be performing,
4. Refuse to carry out any work that he believes will cause to exist an imminent danger to himself or other workers present at the site,
5. Actively participate in daily and weekly safety meetings,
6. Report all safety and environmental incidents to the immediate supervisor.

Chevron Fort Liard Operations

1. Coordinate commissioning & startup timing with project construction progress,
2. Assume overall responsibility for the safety for the existing K-29 wellsite and pipelines,
3. Issue required work permits for all work to be performed inside Chevron facility boundaries,
4. Develop detailed procedures for the purging and safe start-up of the completed new facilities,
5. Perform the initial safety checks for all work permits issued,
6. Review and advise on the safety of tie-ins at the existing plant,
7. Implement the Fort Liard area ERP in the event of an incident.

Ft.Liard Area Projects
Construction Safety & Environment Organization Chart



3.0 Emergency Response Information

Introduction

The Fort Liard Construction Emergency Response Plan (CERP) for Facilities and Pipeline Construction supplements the Chevron Canada Resources Crisis Management Plan. The purpose of this Emergency Plan is to assign responsibilities and to define the action to be taken in an emergency situation at all Chevron Canada Resources facility leases and pipeline right of ways during construction activities.

Chevron is responsible for meeting the following objectives in this Plan.

- Ensure worker and public safety.
- In all cases, provide a responsible assessment of the emergency, effective leadership, good personnel training and well-maintained operating equipment, to minimize the effect of an emergency.
- Communicate the proper information to company personnel, contractors, workers and residents affected by the emergency, and government agencies as required.
- Ensure all major job hazards shall be identified with the contractor, and how these hazards will be managed shall be discussed at the pre-job and subsequent safety meetings.
- Ensure the ERP documents shall be posted throughout the worksite for easy access including all office trailers and lunchrooms. Emergency numbers and GPS locations are to be posted by all telephones and other prominent locations at the job site.
- Ensure an emergency conveyance vehicle and first aid trailer shall be supplied and available to respond to any incidents.
- The Chevron Site Safety Inspectors will conduct verbal drills at the weekly site safety meetings.

The Contractor is responsible for meeting the following objectives in this Plan.

- Ensure that all site personnel are familiar with the CERP through continued communication of the plans through worker orientations and at kick off and weekly safety meetings.

Area Description

The Fort Liard facilities will be located in an unpopulated mountainous area on territory land.

Within the Emergency Planning Zone there are no residences, trap lines, producing wells, additional operators or other public facilities. The nearest urban center is Fort Liard,

which is located 26 km south – southeast from K-29 location or 10 km from 0 –80 location. The nearest public facility is the Amoco Gas Plant that is located 16 km southwest from K-29 location.

There are two airstrips in the vicinity:

1. Pointed Mountain Airstrip is 1524m (5000 ft) in length and 30m (100 ft) in width. It's GPS location is

Latitude	N 60 Deg 24 min 49.0 sec
Longitude	W 123 Deg 49 min 28.0 sec

2. Fort Liard Airstrip is 3000 ft in length and 100 ft in width. It's GPS location is

Latitude	N 60 Deg 20 min 13 sec
Longitude	W 123 Deg 49 min 20 sec

The Chevron Incident Command Post

The Fort Liard K-29 location would be the location of the Incident Command Post. In the event that the Fort Liard K-29 facility becomes part of the hazard area, the Incident Command Post will be relocated to the main Chevron Construction Base Camp. In any event, cellular telephones and two way radios will be used to communicate.

Activities to control the incident and the initial public protection measures will be managed at the Chevron Incident Command Post. The NEB and other government agencies may become involved as necessary.

The following specific activities will be initiated at the Incident Command Post:

- monitor and redefine the hazard area during the early stages of the incident
- supervise the efforts at the incident site to control the situation
- warn and evacuate the public within the Hazard Area or the entire Emergency Planning Zone
- ensure the health and safety of the workers at the incident site
- monitor gas concentrations within the closure order area for the safety of the workers
- ensure security within the immediate hazard area
- provide technical information related to the incident
- make evacuation decisions
- may respond to on-site media enquiries
- provide situation reports only to the Chevron Emergency Operations Centre (EOC)

Chevron Emergency Operations Centre

The Chevron Emergency Operations Centre (EOC) will be located in the Calgary Office (Room 1342).

The Chevron EOC:

- assist in coordinating the overall CCR response activities within the emergency planning zone
- provides support to the On-site Incident Command Centre
- assists with telephone evacuation notification of area residents, company personnel, contractors, industrial operators, etc.
- maintains overall record of hazard area evacuation
- arranges for air monitoring and safety equipment, aircraft, emergency services, etc.
- maintains communication with Company Management and Area Off-Site/Government Emergency Operations Centre

EMERGENCY CONTACT INFORMATION

1. Emergency Services

Royal Canadian Mounted Police		
Fort Liard	Emergency	867-770-4221 (24hr)
Fort Nelson	Emergency	250-774-2777 (24hr)

Hospital		
Fort Liard Health Centre	Nursing Station	867-770-4301 (24hr)
Fort Nelson	Hospital	250-774-6916 (24hr)

Fire / Ambulance Department		
Fort Liard		867-770-2222
Fort Nelson		250-774-2344

Aircraft Fixed Wing – ***Note Villers Air is equipped to fly Medivac and can fly in darkness and land at Fort Liard airport during darkness. Approximate 1 to 1.5 hours response time from time of call to landing in Fort Liard.***		
Villers Air	Fort Nelson	250-774-2072 (24hr)
Chevron Aviation	Calgary	403-571-5903 403-804-6140 403-256-5912

Helicopters – Both equipped to do Medivacs during daylight hours only.		
Deh-Cho	Fort Liard	867-770-3116
Northern Mountain	Fort Nelson	250-774-6119

Note: Helicopters cannot fly during darkness or IFR conditions.

2. Chevron Canada Resources Operations Contacts		
Fort Liard Control Room	Fort Liard Fax #	
Fort Liard Operator		
Fort Liard Operator		
Fort Liard Operator		

3. Calgary Emergency Support Staff:		
Chevron Emergency Operations Centre - EOC*	Calgary Fax	403-234-5799 403-234-5668
Emergency Operations Centre Setup support		403-661-0001 (P)
Calgary Head Office	Calgary	403-234-5000
Calgary Front Desk - 24 hour		**403-234-5971**

*** Only when Chevron EOC operational.**

4. Calgary Construction Supervisory Personnel			
Title	**Name**	**Location**	**Telephone**
Deputy Crisis Manager Facilities Engineering Coordinator	Russ Kear	Calgary	403-234-5416 (O) 403-270-7232 (H)
Incident Commander Project Coordinator	Brad Lock	Calgary	403-234-5672 (O) 403-254-0980 (H)
Planning & Logistics Section Chief/Evacuation Coordinator Fort Liard	Jess Corbett Barry Tibbatts	Logistics Coordinator Pipeline Coordinator	403-234-5196 (O) 403-217-4813 (H) 403-234-5056 (O)
Safety Officer Safety Coordinator	Bob Tansowny	Calgary	403-234-5813 (O) 403-948-9373 (H)

Calgary Supervisory and Support Personnel			
Crisis Manager, President	Jim Simpson	Calgary	403-234-5682 (O) 403-294-5876 (H)
EH&S Advisor Environment Health and Safety Manager	Ted Spearing	Calgary	403-234-5184 (O) 403-288-7545 (H) 403-661-0501 (P)
Emergency Response Advisor EOC Advisor	Jan Major	Calgary	403-234-5034 (O) 403-640-0254 (H) 403-661-0001 (P)
Spill On-Scene Coordinator Spill Specialist	Lorne Schmidt	Drayton Valley	780-894-2101 (O) 780-542-6290 (H) 780-551-7533 (C)
Public Affairs Officer Manager, Communications& External Affairs	Charlie Stewart	Calgary	403-234-5656 (O) 403-287-0423 (H) 403-661-0187 (P)

Calgary Supervisory and Support Personnel			
Claims Coordinator Field Land Representative	Glenn Miller	Calgary	403-234-5399 (O) 403-946-5258 (H) 403-540-7491 (C)
Legal Officers	Mike Smith	Calgary	403-234-5322 (O) 403-270-4003 (H)
	Dick Pashelka	Calgary	403-234-5881 (O) 403-640-3900 (H)
Engineering Advisor Drilling & Engineering Services Manager	Buddy Barnett	Calgary	403-234-5051 (O) 403-249-0847 (H)
Drilling Superintendent	Al Cutt	Calgary	403-234-5008 (O) 403-547-6601 (H)
General Manager , Strategy People and Planning	Jim Causgrove	Calgary	403-234-5712 (O) 403-244-0507 (H)
Human Resources	Merle Gouldie	Calgary	403-234-5661 (O) 403-547-2598 (H)
Aviation Services Team Leader	Rene Lavoie	Calgary	403-571-5903 (O) 403-256-5912 (H) 403-804-6140 (C)
Aviation Assistant	Carrie Hucal	Calgary	403-571-5908 (O) 403-948-7658 (H) 403-515-7497 (P) 403-813-9919 (C)

5. National Energy Board (NEB) **Also handle Occupational Health and Safety**		
Calgary		403-292-4800 403-292-5503 (Fax)
Andy Graw	Conservation/Safety Officer	403-299-2790 (O) 403-547-3073 (H)
Chris Knoechel	Conservation/Safety Officer	403-299-3866 (O) 403-241-0047 (H)
Rick Turner	Operations Inspector	403-299-3868 (O) 403-257-0840 (H)
Bruce Moores	Environmental Specialist	403-299-3926 (O) 403-201-3765 (H)
John Koree	Environmental Specialist	403-299-6614 (O) 403-275-6256 (H)
Terry Baker	Chief Conservation Officer	403-299-2792 (O) 403-239-5032 (H)
John McCarthy	Chief Safety Officer	403-299-2766 (O) 403-240-2345 (H)

6. Transportation Department		
John Ganat	Fort Liard	867-770-3361
Rod Gunderson	Highway Superintendent	867-695-2478 (office)

7. Environmental Protection		
Forestry (Fires)		867-770-4311
Ross Hagen – Conservation Officer * will handle any fire, spill or wildlife concerns	Fort Liard	867-770-4311
Oil and Chemical Spills	Yellowknife	867-920-8130 (24hr)

8. Health and Social Services		
Mike Drake – Social Worker	Fort Liard	867-770-4301
John Morse – Medical Advisor	Yellowknife	867-920-8931
Lynn Morin – Nurse in Charge	Fort Liard	867-770-4301

9. Worker's Compensation Board		
Rita Chamberlin	Yellowknife	867-920-3847

10. Fort Liard Band	
Fort Liard Band Office	867-770-4421 867-770-3556 (Fax)
Harry Deneron – Chief	867-770-4141 (office) 867-770-4456 (home)

First Aid Injury – Radio Channel #1 dedicated Construction Emergency Channel

STAGE 1 ALERT

- Minor Injury
  (minor cuts, scrapes, sprains etc.)

STAGE 1 ACTION PLAN

- alert on-site first aid personnel
- on-site first aid to administer first aid as required
- advanced first aid response personnel & equipment placed on standby alert
- inform area site & safety co-ordinators
- area site and safety co-ordinators to inform superiors as per construction org. chart

Situation Controlled? → **Yes** → **Stand Down**

No

STAGE 2 ALERT

- Serious Injuries
  (serious cuts, broken bones, loss or altered level of consciousness, chest pain, difficulty breathing, H_2S exposure etc.)

STAGE 2 ACTION PLAN

- dispatch advanced first aid personnel
- continue to administer first aid until advanced personnel arrives, then provide assistance as required
- advanced first aid personnel to take over situation and administer first aid as per their first aid protocols

Situation Controlled? → **Yes** → **Stand Down**

No

STAGE 3 ALERT

- Life threatening injuries

STAGE 3 ACTION PLAN

- evacuation required
- advanced first aid personnel to determine best possible way and location to evacuate injuried to (ground/air, which hospital)
- advanced first aid personnel to appoint person to make necessary communication and arrangements for transport as per construction emergency contact list.

Fire – Radio Channel #1 dedicated Construction Emergency Channel

STAGE 1 ALERT

- Small controllable fire which can be extinguished by using a 30 lb. type fire extinguisher
- May be located at any Chevron facility, lease, camp or surrounding area

STAGE 1 ACTION PLAN

- alert all effected personnel
- if possible and safe to do so block in fuel source
- extinguish fire if trained and fire can be extinguished by the use of 30lb. fire extinguisher, always call for back up when attempting to fight a fire of any size
- inform supervisor as per construction org. chart

Situation Controlled? → **Yes** → **Stand Down**

No

STAGE 2 ALERT

- If fire cannot be quickly extinguished or controlled with a 30lb. fire extinguisher
- if any injury has occurred

STAGE 2 ACTION PLAN

- initiate evacuation
  - ✓ sound alarm
  - ✓ all personnel shutdown equipment around them and muster to designated safe location
  - ✓ foremen account for all your workers and report to Chevron rep.
- Chevron rep. to take charge and determine if all personnel was accounted for and if fire can be safely extinguished using local trained people and readily available resources
- Initiate First Aid Injury ERP immediately

Situation Controlled? → **Yes** → **Stand Down**

No

STAGE 3 ALERT

- Fire cannot be extinguished and out of control

STAGE 3 ACTION PLAN

- Chevron rep. to dispatch outside resources (Fort Liard Fire Dept., RCMP, Forestry etc.) as per construction contact phone list
- if necessary Chevron rep. must consider expanding evacuation area and moving muster area to a safer location

Motor Vehicle Accident / Equipment Damage

Radio Channel #1 dedicated Construction Emergency Channel

STAGE 1 ALERT

- Minor vehicle accident less then $1000.00 damage where no injuries, fire, H_2S release or environmental damage has occurred

STAGE 1 ACTION PLAN

- ensure all parties involved are ok
- ensure area is safe and roadways are managed to prevent further accidents
- ensure the is no chance for fire, H_2S release or environmental damage
- inform supervisor as per construction org. chart
- inform RCMP as required to report vehicle damage

Situation Controlled? → **Yes** → **Stand Down**

No

STAGE 2 ALERT

- Any injuries
- Any fire
- Any environmental damage
- Any H_2S release
- Damage greater then $1000.00

STAGE 2 ACTION PLAN

- Initiate First Aid ERP immediately
- Initiate Fire ERP immediately
- Initiate Environmental ERP immediately
- Initiate H_2S ERP immediately
- Notify RCMP (mandatory)

Situation Controlled? → **Yes** → **Stand Down**

No

STAGE 3 ALERT

- Any vehicle/equipment accident where occupants need to be extricated

STAGE 3 ACTION PLAN

- Chevron Rep. or Advanced First Aid Personnel to dispatch Fort Liard Fire Dept.

H2S Release – Radio Channel #1 dedicated Construction Emergency Channel

STAGE 1 ALERT → **STAGE 1 ACTION PLAN**

- **Odour Complaint**

- move to safe area
- alert on-site personnel
- dispatch Chevron safety personnel to investigate
- Chevron Safety personnel to investigate using gas detection equipment and breathing apparatus
- inform area Site & Safety Co-ordinators and Chevron Operations

Situation Controlled? → **Yes** → **Stand Down**

No

STAGE 2 ALERT → **STAGE 2 ACTION PLAN**

- Release confirmed by visual check and gas detection alarm

- initiate evacuation
  - ✓ sound alarm
  - ✓ all personnel shutdown equipment around them and muster to designated safe location
  - ✓ foremen account for all your workers and report to site safety
- Site Safety to dispatch Chevron Operations to release site
- Site Safety attempt to control release if safe to do so

Situation Controlled? → **Yes** → **Stand Down**

No

STAGE 3 ALERT →

- Uncontrolled unignited H_2S release
- Man down from H_2S exposure

STAGE 3 ACTION PLAN

- expand monitoring area
- consider expanding evacuation area
- Construction Safety to assist Chevron Operations as required to control release
- Initiate First Aid ERP
- Trained personnel to perform rescue as per PITS H_2S protocol

Natural Disaster – Rock Slide, Snow Avalanche, Earth Quake, etc.

Radio Channel #1 dedicated Construction Emergency Channel

STAGE 1 ALERT

- Any Hazard Identification for the potential of a Rock Slide or Snow Avalanche of happening

STAGE 1 ACTION PLAN

- everyone evacuate affected area to safe location
- foremen to account for all workers in area
- inform supervisor as per construction org. chart
- no one is to return to affected area until deemed safe by Chevron supervisor
- Chevron Supervisor to use all resources possible to ensure area is safe before allowing people back into the affected area

Situation Controlled? → **Yes** → **Stand Down**

No

STAGE 2 ALERT

- Where any Rock Slide, Snow Avalanche has occurred
- Any injuries
- Any fire
- Any environmental damage
- Any H_2S release

STAGE 2 ACTION PLAN

- Initiate First Aid ERP immediately
- Initiate Fire ERP immediately
- Initiate Environmental ERP immediately
- Initiate H_2S ERP immediately

Situation Controlled? → **Yes** → **Stand Down**

No

STAGE 3 ALERT

NOT COMPLETE..... TO BE COMPLETED AFTER ACCESSMENT OF AREA IS COMPLETE.

STAGE 3 ACTION PLAN

•

GPS Locations for Helicopter Landing

1.	K-29 Facility	Latitude	N 60 Deg 28 min 41.2 sec
		Longitude	W 123 Deg 35 min 09.5 sec
2.	O-80 Wellsite	Latitude	N 60 Deg 16 min 50.2 sec
		Longitude	W 123 Deg 29 min 8.8 sec
3.	Pointed Mountain Camp	Latitude	N 60 Deg 24 min 59.6 sec
		Longitude	W 123 Deg 49 min 39.0 sec
4.	Repeater Site # 1	Latitude	N 60 Deg 26 min 48 sec
		Longitude	W 123 Deg 37 min 02 sec
5.	Pointed Mountain Airstrip	Latitude	N 60 Deg 24 min 49 sec
		Longitude	W 123 Deg 49 min 28 sec
6.	Fort Liard Base Camp	Latitude	N 60 Deg 24 min 59.6 sec
		Longitude	W 123 Deg 49 min 39.0 sec
	Fort Liard Airstrip	Latitude	N 60 Deg 20 min 13 sec
		Longitude	W 123 Deg 49 min 20 sec

REVISED SEPT. 22/99

LEGEND

1.) PROPOSED PIPELINE IS SHOWN THUS. . . . . .

2.) EXISTING ROADS SHOWN THUS. . . . . .

3.) PROPOSED ROAD IS SHOWN THUS. . . . . .

4) HELICOPTER LANDING LOCATIONS SHOWN THUS . . . . . (1)

CHALLENGER
SURVEYS & SERVICES LTD
CALGARY – ALBERTA

NO.	DATE	DESCRIPTION	BY
02	12/01/99	ADDITION OF HELICOPTER LANDING SITES	B.T.

REVISION TABLE

CHEVRON CANADA RESOURCES LIMITED

MAP SHOWING

FORT LIARD PRODUCERS PIPELINE PROJECT

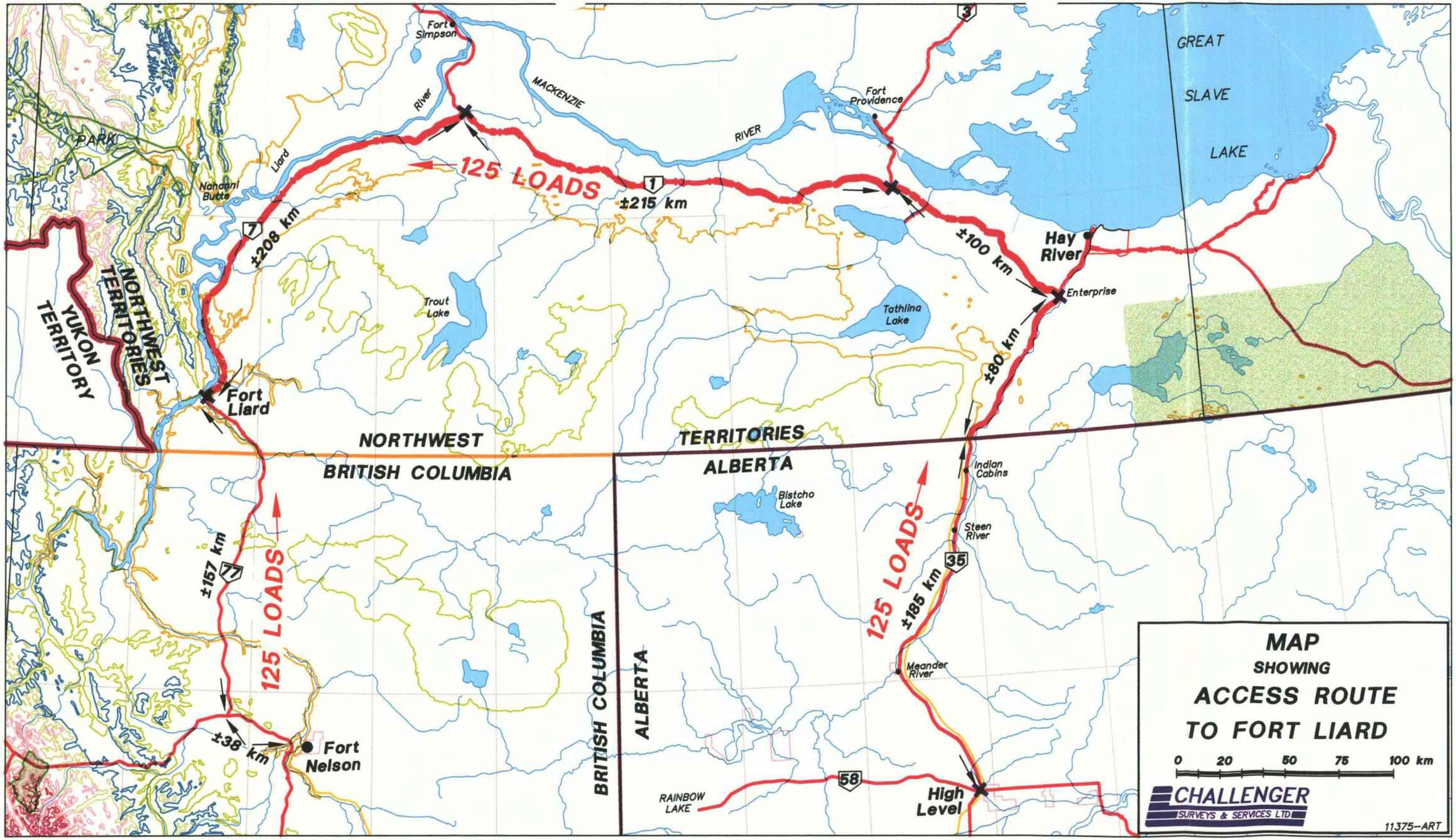
NORTHWEST TERRITORIES

SCALE 1:150000

10000 6000 2000 0 5000 10 000 Metres

1999 RON ROBINSON C.L.S.

DATE :	DRAWN BY :	CHECKED :	JOB NO. : 99-11172CON
DEC. 1, 1999	B.S.S.	BY: R.R.	VIEW : COVER SHEET


Fort Simpson
MACKENZIE
River
RIVER
Fort Providence
GREAT
SLAVE
LAKE
PARK
Nahanni Butte
Liard
125 LOADS
1
±215 km
3
±208 km
7
±100 km
Hay River
Enterprise
Trout Lake
Tathlina Lake
±80 km
YUKON TERRITORY
NORTHWEST TERRITORIES
Fort Liard
NORTHWEST TERRITORIES
BRITISH COLUMBIA
ALBERTA
Indian Cabins
Bistcho Lake
Steen River
125 LOADS
±185 km
35
±157 km
77
125 LOADS
BRITISH COLUMBIA
ALBERTA
Meander River
±38 km
Fort Nelson
RAINBOW LAKE
58
High Level
MAP
SHOWING
ACCESS ROUTE
TO FORT LIARD
0 20 50 75 100 km
CHALLENGER
SURVEYS & SERVICES LTD
11375-ART

ROAD BLOCK PROCEDURES

Road Block personnel should follow the procedures outlined below when establishing and manning road block positions:

- ENSURE YOUR SAFETY AT ALL TIMES.
- Proceed to assigned road block position.
- Park vehicle on side of road facing in the direction of on-coming traffic that is to be stopped.
- Emergency flashers (or rotary beacon if so equipped) are to be on at all times.
- Fluorescent orange vests are to be worn at all times.
- Set up road block barriers on road. Turn on flashers if so equipped.
- Use Road Block Numbers ONLY (not names) when communicating on the radio system.
- Stop ALL traffic from entering the emergency planning zone (closed area).
- Inform unauthorized vehicle occupants of the emergency and danger and suggest they not enter the closed area.
- Provide detour directions around the closed area for all other unauthorized traffic.
- DO NOT ATTEMPT TO PREVENT ENTRY INTO THE CLOSED AREA IF VEHICLE OCCUPANTS INSIST ON PROCEEDING.
- Should unauthorized traffic insist on proceeding past the road block after being informed of danger:

1. Obtain and record the following information if possible:

   - Make of vehicle
   - Colour of vehicle
   - Vehicle licence plate number
   - Names, addresses and telephone numbers of vehicle occupants
   - Residence location (and map#), if occupants live within closed EPZ area
   - Next-Of-Kin of all occupants
   - Time that vehicle proceeded past the road block

2. Allow vehicle to pass.

3. Advise On-site Command Post and next road block location of passage of vehicle. Request command post notify AEUB and/or RCMP

- Also record the time, occupants names and affiliation, and vehicle license plate number of all authorized vehicles entering or leaving the Closed Area. Advise On-Site Incident Command Post.

- Frequently monitor the air for H_2S (or SO_2 if well ignited). If H_2S levels exceed 15 ppm for 15 minutes (or SO_2 levels exceed 5 ppm for 15 minutes), inform the On-site Incident Command Post and move the road block back to a secure area.

CRITICAL INCIDENT STRESS DEBRIEFING

Following a traumatic incident or accident, stress "diffusing" and "debriefing" may be desired for the person or persons directly involved with the incident and/or victim, in an attempt to minimize the negative impact to these individuals.

This service is supplied by Chevron's Employee Assistance Program who keep updated lists of people qualified to do such briefings.

Phone: 1-800-461-8908

DIFFUSING - should take place as soon as possible following the trauma e.g. if the incident happened at 2300 hr, a diffusing should take place just before those involved leave their shift the next morning. A diffusing is incident-specific; no feelings are drawn out at this point; communication at a cognitive level only - "what happened?". Takes approximately 15-20 minutes depending on the number of people. Diffusing necessary to inform those traumatized that the feelings they are experiencing are normal and make them aware of post trauma stress symptoms: loss of appetite, inability to sleep, irritability.

DEBRIEFING - ideally and theoretically should take place approximately 72 hours following the trauma. Designed to get those involved in touch with their feelings and give them support so that they may cope with what they have experienced. Not an operational critique, no-one is given an opportunity to place blame or point fingers. Time limit cannot be placed; general guideline allows bout 12-15 minutes per person (commonly about 2.5 hours). Team may consist of two or three "facilitators".

Rules of a Debriefing:

- Only those people involved should attend e.g. those at scene of accident or those who assisted victim. This is important as the point is to have a group who are sharing similar feelings.

- Should not be held at the workplace. Preferable in town away from site of incident. Also, should take place when the people attending do not have to leave debriefing and go directly to work.

- Must be authorized by Management (to alleviate any kind of liability charges against the debriefing team).
- Strictly voluntary; only those wishing to attend will do so, but should be encouraged.

- No management will be present, nor will management be discussed. They can meet with the debriefing team on a separate occasion at management's discretion.

- CONFIDENTIALITY - everything discussed is held in strict confidence by the counsellors and the same ethics must apply to all who attend.

- It is not mandatory that a person contribute thoughts or words; he/she may just listen.

Safety Responsibilities
Chevron Fort Liard Area Projects
RACI Table

Task	Chevron Safety Coordinator & Inspectors	Chevron Site Coordinator	Chevron Project Coordinator	Contractor Superintendent	Contractor Safety Representative	Contractor Foreman	Contractor Employees	Sub-trades	Chevron Operations
Plan Daily Work	C	A	I	R	C	C	I	C	I/C
Ensure O.H.S. Awareness	R	R	I	A	R	R	R	R	R
Work to O.H.S. Requirements	R	R	I	A	R	R	R	R	R
Daily Site Inspections	A/R	A	I	A	R	R	C	R	C
Weekly Site Inspections	A/R	A	I	A	R	R	C	R	C
Ensure Deficiencies Corrected	R	A	I	A	R	R	C	R	C
Initial Hazard Assessment	R	A	I	A	R	C	C	C	R
Prepare/conduct Daily Tailgates	C	C	I	A	C	R	C	C	C
Prepare/conduct Gen. Safe Meetings	R	C	R	A/R	R	C	C	C	C
Conduct Orientations	R	A		A	R	R			A
Cooperate with Safety Reps.	R	A	R	A	R	R	R	R	R
Investigate Accidents/Incidents	A/R	A	A	A	R	R	C	R/C	R
Report Injuries	A/R	A	A	A	R	R	R	R	R
Report Near Misses	A/R	A	A	A	R	R	R	R	R
Tool & Equipment Safety Checks	R	R	I	A	R	R	R	R	C
Instruct Workers in S.W.P.	R	R	C	A	R	R	C	R	R/C
Report Safety Violations	A/R	A	A	A	R	R	C	R/C	R
Advise Worker Supplies P.P.E.	R	A	C	A	R	R	C	R/C	A
Supply Additional P.P.E.	C	C	C	A	R	R	C	R	C
Enforce Proper P.P.E.	R	A	R/C	A	R	R	I	R/I	R
Ensure Proper Training	R	A	R	A	R	R	I	R/I	C
Administer Sub-trades	R	A	C	A	R	C	I	N/A	C
Administer E.R.P.	A	R	A	R	R	R	C	C	A
Knowledge of Contractor Safety Manual & Procedures	C	C	C	A	R	R	R	R/C	C
Waste management	C	A	A	R	C	R	C	R	A
Camp Safety Considerations	C	A	A	A	C	R	R	R	C

R Responsible to ensure compliance
A Accountable – has ultimate responsibility
C Consulted – provides input & other resources
I Informed – is kept in the information loop

Information Data Sheet

Date:_____ Time: _____

Facility:_____

Location:_____

Caller:_____ Company:_____

Callback Information:_____

Type of Emergency:_____

_____

_____

_____

Chronological Sequence

Time	Event
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Signed:_____

NOTE RESPONSIBILITIES THAT HAVE BEEN ASSIGNED:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____

EMERGENCY INCIDENT FACT SHEET

(Also Information for Media Spokesperson

Date: _____

Time: _____ (Hrs. 0-2400)

Initial Incident Notification

Caller's Name: _____

Caller's Address: _____

_____

Caller's Phone Nos. Home _____ Work _____

Type of Emergency/Release

Stage/ level of alert 1 ☐ 2 ☐ 3 ☐ Other ☐ (Specify) _____

Injury ☐ Fire ☐ Vehicle Accident ☐ H_2S Release ☐ Rock Slide ☐
Snow Avalanche ☐ Hazardous Chemical/Dangerous Goods☐

Other ☐ (Specify) _____

_____

Released onto/into: Air ☐ Land ☐ Water ☐

Injuries ☐ CCR/Contractor (Explain) _____

Fatalities ☐ CCR/Contractor (Explain) _____

Location/Source and Time of Incident

Field/Area _____ Location (Lsd.) _____

Proximity to and name of nearest village/town/city _____

Plant ☐ Well ☐ Pipeline ☐ Surface facility (Specify) _____ Truck ☐ Tank car ☐

Name of consignor & carrier (Dangerous Good) or contractor _____

Time of incident or discovery _____ (Hrs. 0-2400)

What was damaged/destroyed (i.e., facility, property)? _____

_____

Suspected cause _____

_____

Estimated volume lost/rate _____ Size of spill area _____

Emergency Area Description

Forest ☐ Field ☐ Muskeg ☐ Hills ☐ Flat ☐ Near water ways ☐

Near residents ☐ Near campground ☐ Near public facility ☐

Distance to nearest residence/campground/public facility: _____

Are any people in immediate danger? Yes ☐ No ☐ Have residents been notified? Yes ☐ No ☐

Has anyone evacuated the area? _____

Where have evacuees been sent? _____

ALSO COMPLETE OPPOSITE SIDE

Emergency Area Description (con't.)

Road access/conditions: _____

If a gas release, what equipment is near it? _____

Can you smell gas? Yes☐ No☐ If yes, from how far? _____

Can you hear it? Yes☐ No☐ If yes, from how far? _____

Can you see it? Yes☐ No☐ If yes, from how far? _____

Has H2S/HVP gas release been ignited? Yes ☐ No ☐

Have possible sources of ignition been extinguished? Facilities Yes ☐ No ☐
Resident Yes ☐ No ☐

Actions Taken To Control Release

Has source of emission been shut off? Yes ☐ No ☐

If No, can source be easily shut off? Yes ☐ No ☐

What is the spill migration potential? _____

_____

Action taken to control release/prevent spread of spill: _____

_____

_____

_____

Weather Conditions

Wind Direction: _____ Wind Speed: _____ km/hr Wind Gusts Yes ☐ No ☐

Other Weather Conditions (Specify): _____

_____

Other Contacts Caller Has Already Made

RCMP: _____ NED: _____

FIRE DEPARTMENT: _____ ENVIRONMENT: _____

AMBULANCE: _____ Others: _____

Information Taken By

Name: _____ Phone No. _____

Position: _____ Location: _____

AS SOON AS TIME PERMITS, PHONE OR FAX THIS INFORMATION TO:

1. Emergency Response command Personnel (i.e., Operations Section Chief, Incident Commander, Deputy Crisis Manager, etc.).
2. Communications and External Affairs.

4.0 GENERAL SAFETY

4.1 Safe Work Practices

Workers shall follow their Contractor's specific safe work procedures for all hazardous tasks. Chevron's Pre-Job Meeting Checklist will be reviewed with all Contractors and is attached as part of this Plan. The Area Safety Coordinator will retain minutes from this meeting. The Checklist includes a section on safety and work procedures. Contractors shall ensure that workers and subcontractors are familiar with applicable safety procedures. These procedures should be reviewed periodically during tailgate safety meetings, general safety meetings, and as required prior to very hazardous tasks.

4.2 Certification

The Contractor will provide the qualified personnel in accordance OH&S regulations for the number of personnel on site. Each major Contractor will ensure that all work crews under his control (this includes subcontractors) have personnel adequately trained to provide initial response if necessary to on-the-job injuries for that work crew. A record of those personnel with first aid training shall be created for the Area Safety Coordinator.

Adequate emergency conveyance resources will be identified and provided.

Each and every worker requires the following valid certification prior to entering the work site:

H2S Alive (Facility Contractors)
WHMIS

4.3 Personal Protective Equipment Requirements

Requirements to be utilized at all times:

- Steel toe safety boots
- Safety eye wear
- Hard hats
- Hand protection
- Fire retardant clothing (required at all facilities including wellsites, tie-ins and pipeline crossings)

As required

- Safety belts, safety harnesses and lifelines
- Self contained breathing apparatus
- Hearing protection in/around operating machinery
- Face shields

Additional Requirements for welders

- Appropriate coveralls (leather, Carhart, or equivalent) may be used in lieu of fire retardant coveralls.
- welders shall wear safety lenses when grinding

Note: Workers without the proper personal protective equipment will be refused access to the site.

4.4 Safety Meetings

Each Contractor shall conduct weekly safety meetings which will be attended by all Chevron and Contractor personnel (including subcontractors). Relevant documentation will be kept including attendees and subjects discussed.

Some suggested issues to be discussed at these weekly safety meetings are as follows:

- Review relevant procedures for upcoming tasks
- Training videos
- Public recognition for good safety behaviors ("atta boy"s, etc.)
- Discuss relevant incidents from other jobs
- Safety concerns from employees
- Timely review of incidents from current job, if any
- Safety audit results
- Verbal ERP drills
- Waste Management Plan
- Other relevant topics as the need is identified

Tailgate safety meetings shall be held daily on a crew by crew basis to review/discuss the day's planned activities; before any hazardous tasks are undertaken to review the procedures, and as otherwise deemed necessary to deal with safety issues as they arise. The purpose of the tailgate safety meetings are as follows:

- to identify the specific hazards associated with the tasks to be performed,
- to review the procedures to be followed to perform the tasks safely,
- to discuss and communicate any specific safety requirements of the work permit,
- to discuss the root causes of incidents and recommendations to prevent recurrence

Relevant documentation will be kept including attendees and subjects discussed.

4.5 Incident Reporting

Chevron encourages near miss reporting. The intent of near miss reporting is not to find fault or to assign blame but rather to involve every worker in identifying hazardous conditions/procedures so that actions can be taken to correct the condition, thereby creating a safer work environment.

Contractors shall report promptly all incidents including:

- lost time accidents (LTAs)
- medical aids
- environmental spills
- motor vehicle accidents
- property or equipment damages
- near misses
- hazard identifications

to the Site Safety Inspector. The Site Safety Inspector will inform the Chevron Site Coordinator.

High risk incidents may require a team investigation to determine root causes and to make recommendations to prevent similar incidents from occurring in the future.

A written report is required for all incidents. The Contractor may use his standard report form but it should contain at least the information asked for on the Chevron Incident Report form. The Site Safety Inspectors are available to assist in the preparation of incident reports. To maintain a standard report format for Chevron, the Area Safety Coordinator shall complete Chevron's Incident Report form and forward to the Site Coordinator **within 48 hours of the incident**.

These incidents will be reviewed at safety meetings for the purpose of learning and identifying changes required to prevent recurrence.

4.6 Safety Performance Incentives

All Contractors on the site are eligible for safety performance incentives. This incentive is intended to promote a positive attitude toward safety among every individual on the job site and to encourage working together between Contractors and to foster a "look out for the next worker" awareness. This incentive is offered in addition to the Contractor's safety awards program.

Safety awards will be given for hazard identifications.

Localized incentive programs will be reviewed with individual Contractors.

4.7 Site Orientation for New Workers

All workers are required to be oriented before performing any work at the site. The Area Safety Coordinator and his Safety Inspectors, in conjunction with the Contractor Safety Representative, will be responsible for the general Chevron site orientation. Other Contractor specific orientations should not duplicate the information covered in the site general orientations. Detailed Contractor work procedures should be reviewed at tailgates and where appropriate. The safety orientation must include the following:

- policies and procedures - Construction Safety and Environment Plan
- Chevron 'Health and Safety Rules' handbook (to be signed)
- specific site hazards
- review of the RACI diagram - responsibilities and expectations
- understanding of the worker's right to refuse unsafe work
- Construction ERP - MUSTER POINTS
- Alcohol and drug policy

Documentation will be kept to demonstrate that each worker has the necessary certification and has received and understood the material covered in the site orientation.

4.8 Work Permits

Work permits or equivalent are required for all work.

The Facility Safety Inspector is responsible for issuing daily safe work permits for all work at the Fort Liard area facility sites. Daily meetings between the Contractors' Facility Superintendent and Chevron's Facility Coordinator will be held to review the following day's work. The Facility Coordinator and the Facility Safety Inspector will use the information to create and issue the work permits.

The Pipeline Contractor is responsible for holding morning tailgate meetings to review the day's work activities. Minutes will be recorded and kept on file in lieu of work permits. Minutes to be handed in to Pipeline Safety Inspector daily.

4.9 WHMIS / MSDS

Some WHMIS controlled materials will be utilized on site. Each contractor is required to identify these materials and to retain MSDS's for these materials.

MSDS's shall be kept in site construction office and with the Site Safety Inspectors.

A copy of the MSDS's shall be provided to Operations.

An MSDS must accompany all controlled products to site.

4.10 Driving

Refer to the Safe Driving work practice for Company rules and recommended practices for driving.

Contractors will be providing mass transportation from the camp to the construction site where practical. Vehicular traffic on the roads between the camp and the job site as well as on/around the job site will be kept to the absolute minimum necessary to perform the work.

Chevron may be employing a "road patrol cop" to encourage safe driving on all roads to/from the Fort Liard work site. This includes vehicles hauling materials and equipment to the construction site by road.

The recommended speed limit for roads in the Fort Liard area is 60 km/h. The speed limit in all Chevron facilities is 15 km/h. Be aware that wildlife may wander on to roads.

Driving infractions identified by the road patrol cop or any other Chevron representative will be viewed as a blatant disregard for safety and will be documented and reported to the Contractors' Supervisors, Site Safety Inspectors and Area Safety Coordinator.

One warning will be given; a second violation will result in removal from the project.

4.11 Communications

A two way radio system will be provided for communications on the construction site. The channels will be allocated as required.

4.12 Drugs and Alcohol

Chevron's attached Drug and Alcohol Policy will be enforced.

No illegal or unauthorized drugs, intoxicating beverages, firearms or weapons are allowed on this construction or campsite.

Persons under the influence of drugs, stimulants or alcohol will be refused entry to these sites.

The persons, vehicles and any other items entering or leaving the site may be subject to search.

NOTICE TO CONTRACTORS

ALCOHOL AND OTHER DRUG USE POLICY
FOR CONTRACTORS, THEIR EMPLOYEES, SUBCONTRACTORS AND THEIR EMPLOYEES

POLICY

While performing services for Chevron Canada Resources ("Company") Contractors, their employees, subcontractors and their employees must be aware of and comply with the following Policy regarding drugs and alcohol:

Chevron prohibits anyone being unfit for work due to the use of or after-effects of alcohol, illicit or illegal drugs, or the misuse of medications or other substances. In addition, to minimize the risk of unsafe or unsatisfactory performance due to the use of alcohol or other drugs, the following apply:

- ***Illicit/Illegal Drugs:*** While on Company business or on Company premises, the following are prohibited: the use, possession, distribution, offering or sale of illicit drugs, illegal drugs or drug paraphernalia; the possession, distribution, offering or sale of prescription medications for which a prescription has not legally been obtained; and the presence in the body of illicit or illegal drugs.
- ***Alcohol:*** The use, possession, distribution, offering or sale of alcoholic beverages on Company premises is prohibited.
- ***Medications and Other Substances:*** Employees and contract workers are expected to use medications, both prescribed and over-the-counter, responsibly. The intentional misuse of prescribed medications, over-the-counter medications and other substances (e.g., using the medication not as it has been prescribed or using someone else's prescription medication) on Company business or Company premises is prohibited. Medications of concern are those that inhibit or may inhibit an employee's ability to perform their job safely and productively.

Any person violating this Policy will be removed from the Company premises and may be denied future access to Company work locations. In addition, the Company may suspend work or, in repeated or serious situations, terminate a contract as a result of violation of this Policy. In appropriate cases, local law enforcement agencies may be advised of violations.

SEARCH

To help ensure a safe and productive work environment, the Company in support of this Policy, may conduct or require searches as set forth in the following:

Unless prohibited by applicable law, the Company reserves the right to carry out searches of individuals and their personal effects when entering Company premises, while on Company premises, and when leaving Company premises. The Company may also require the Contractor to search its employees, subcontractors or their employees in the same manner. The Company may initiate such searches without prior announcement and conduct them at such times and locations as deemed appropriate. Entry onto Company premises constitutes consent to a search of the person and his/her personal effects, including, without limitation, packages, briefcases, purses, lunch boxes and vehicle, or any office, locker, closet or desk on Company premises or work locations. An individual may elect to decline to cooperate, however, refusal to cooperate will be cause for not allowing that individual on Company premises.

TESTING

Unless prohibited by applicable law, the Company may request the Contractor to conduct a controlled substance and/or alcohol test(s) on any of its employees or subcontractors and their employees in safety-sensitive positions, while on Company premises, engaged in Company business, or operating Company equipment. In addition, the Company may request the Contractor to conduct a controlled substance and/or alcohol test(s) on any of its employees or subcontractors and their employees in safety-sensitive positions, before entering Company premises, engaging in Company business or operating Company equipment. Prior written consent shall be obtained from any person who is to be tested. A positive test on a Contractor or subcontractor or their employees or failure to give written consent for a test shall be cause for removal from Company premises and shall result in the Contractor or subcontractor or their employee being restricted or disqualified from performing services for Company or its affiliated companies.

NOTIFICATION OF SEARCH AND/OR TEST BY THE CONTRACTOR

Should a Contractor choose to conduct a search and/or test of its employees or its subcontractors or their employees while on Company premises, the Contractor shall notify the local Company facility for prior approval.

DEFINITIONS

As used herein, "drug" means any chemical or biological substance, including alcohol, where the use has the potential to change or adversely affect the way a person thinks, feels or acts. Drugs of concern are those that inhibit or may inhibit a worker's ability to perform their job safely and productively.

As used herein, drug or alcohol "test" means a scientifically recognized test which may include analyzing an individual's urine or breath for evidence of drug or alcohol use.

As used herein, "safety-sensitive position" refers to a position where the individual performing the requirements of that position:

- can directly cause a critical or catastrophic accident by their actions or inactions, or ,
- has the responsibility of directing others where their direction can cause an action or inaction which may result in a critical or catastrophic accident.

As used herein "Company premises" includes but is not limited to all land, buildings, property and facilities owned, leased, operated or otherwise controlled by Chevron. This includes aircraft, mobile equipment and vehicles that are leased or owned by the Company.

ALCOHOL AND OTHER DRUG USE POLICY FOR CONTRACTORS SIGN-OFF SHEET

The *Contractor* shall comply and ensure its employees, subcontractors and their employees comply with Chevron Canada Resources' (the "Company") Policy on Alcohol And Other Drug Use (the "Policy") as described in the ***NOTICE TO CONTRACTORS***.

In furtherance thereof, the *Contractor*, its employees, subcontractors and their employees shall be subject to the following terms and conditions:

1. The *Contractor* shall provide a copy of the ***NOTICE TO CONTRACTORS*** to all its employees, subcontractors and their employees, and shall advise them of the Company's right to search and shall require them to comply with the Policy. This must be done prior to assigning them to work under this contract.

2. The Contractor shall post the ***NOTICE TO CONTRACTORS*** in a conspicuous manner and place so that each employee, subcontractor or its employee, may read and abide by the ***NOTICE TO CONTRACTORS***.

3. The Company may request the Contractor to conduct (and the Contractor shall conduct) a controlled substance and/or alcohol test(s) or search on any of its employees or subcontractors and their employees, in safety-sensitive positions, while on Company premises, engaged in Company business, or operating Company equipment.

Contractor personnel found to be in violation of the Policy shall be immediately removed and denied access to ›mpany premises, or work location. Any illegal, illicit or unauthorized drugs, or intoxicating beverages ..iscovered as a result of a search may be confiscated and, in appropriate cases, turned over to law enforcement officers.

Failure by the Contractor to comply with the above and with the requirements of the ***NOTICE TO CONTRACTORS*** will be considered a breach of contract by the Contractor and, in repeated or serious situations, may result in the termination of the contract.

The undersigned Contractor understands and agrees to be bound by and to comply with the terms and conditions of Chevron Canada Resources' Alcohol And Other Drug Use Policy as described above and in the ***NOTICE TO CONTRACTORS***.

_____	_____	_____	_____
(Name)	(Title)	(Signature)	(Date)

Company Name and Address (in full): _____

_____

_____

Draft - Pre-Job Meeting Checklist

Project Description:

Name.
Location.
Brief description.

Project Contacts:

Chevron	Contractor
Project Coordinator	Superintendent
Office Contact	Office Contact
Field Foreman	Field Foreman
Expediter	Expeditor
Safety Inspector	Safety Inspector

Project Organization:

Discuss and review the interaction between organizations (i.e.: who calls who for what).
Discuss the levels of authority and responsibility.
Discuss work that will be subcontracted, what the requirements for the subcontractors are, and who possible subcontractors will be.
Discuss the need for safety inspection. If necessary, identify who is responsible for providing safety inspection.

Project Scheduling:

Discuss the hours and days of work.
Establish the start and completion dates.
Obtain a copy of the contractor's manpower schedule for the project; review and discus.
Establish the critical path and identify any activities which may impact the critical path (for example, delays with Chevron supplied equipment).
Discuss the impact that weather may have on the schedule.
Discuss the impact that extras will have on the schedule.

Safety and Work Procedures:

Discuss site specific safety concerns.
Discuss and review critical task list (part of orientation form) and review Chevron or contractor practices and procedures relating to critical tasks.
Review and complete an emergency contact list.
Discuss and review GCS-21.
Discuss the means of communication to be used on site.
Summarize the safety equipment and resources to be maintained on site and identify who is responsible for supplying said equipment and resources.

Review the work permitting system to be used.
Discuss evacuation and emergency response procedures.
Review and complete a jobsite orientation form.

Discuss who to contact if there are questions or concerns.
Agree upon the contents of the project safety plan.

Pollution Prevention:

Discuss the potential for spills or releases and the responsibilities for reporting
Discuss the potential wastes generated during the work and responsibilities for manifesting and tracking.
Review FES Waste Management Plan
Discuss plan for changing lube oil on Chevron sites
Discuss general housecleaning and proper disposal of solid waste on Chevron sites
Discuss who to contact if there are questions or concerns

Quality Control:

Discuss and review the weld procedures and welder qualification requirements.
Discuss and review the handling of MTR's, isometric and spool drawings.
Discuss X-ray and other inspection requirements. Identify who will supply.
Identify whether the acceptance criteria is SP-64, B31.3 or Z662.
Discuss the qualifications of inspection personnel (if contractor supplied); ASNT or CGSB.

Site Layout:

Identify hot work areas.
Identify where office facilities are to be located.
Identify where lunchrooms and toilettes are to be located.
Identify work and laydown areas.

Materials and Equipment:

Discuss and review the scope of Chevron and contractor supplied materials.
Identify where and when Chevron supplied materials will be available.
Identify the dates by which the contractor is expected to have materials supplied by him available at the site.
Discuss what work is to be shop fabricated vs. field fabricated.
Review the Chevron requirements for receiving project materials (for example, cross-checking MTR's to materials and review of carbon equivalents).
Identify any other special requirements (for example, priming of pipe or steel prior to delivery to site.

Drawing Review and Contract Negotiation:

Compare the current drawings to the bid drawings and establish incremental costs based upon quoted rates.
Discuss the handling and approval of extras; will extras be negotiated lump sum, force account or per quoted unit rates.
Discuss the handling of travel time, overtime, lunch hour time on reimbursable contracts.
Supply any additional specifications that are required.
In the case of a formal contract, agree upon the final contract value (the original bid plus any extras identified to date).
Confirm contractor's insurance and WCB status.

Invoicing and Payment:

Discuss the means of establishing progress payments.
Discuss the handling of holdbacks.
On reimbursable work, discuss the handling of time tickets. Tickets should be signed by a Chevron representative daily.

5.0 Environmental Protection Plan

This plan describes measures to be implemented during the construction of the Pipeline and Wellsite Facilities to mitigate impacts identified in the Environmental Assessment study. Protection measures are written in construction specification format under specific activity headings for both Pipeline and Wellsite Facility activities.

Contractors must conduct operations in a manner that minimizes releases and disturbance to the soil, air, vegetation, terrain, wildlife, fish and waterways. Contractors must not introduce situations that will require the need for future reclamation activities. Contractors should conduct business in such a manner as to reduce pollution and conserve energy and natural resources in accordance with Chevron Policy.

Contractors should consult with the on-site Chevron Environmental Coordinator in cases where environmental issues, policies or practices are unclear. The Environmental Coordinator should consult Chevron's Environmental Representative if additional clarification or information is needed.

In the event that an unforeseen environmental issue arises for which no mitigative measures have been approved, Chevron and the Environmental Coordinator will formulate a plan of action in consultation with stakeholders and appropriate regional government agencies as needed. The plan of action will include measures to both assess and mitigate the environmental impact.

No substantial changes to the mitigative measures as they appear in the Development Plan/Environmental Assessment Certificate, Spec Details and on the Alignment Sheets will be made without the concurrence of appropriate government authorities.

If the requirements of permits or the direction given by regulators are found to be conflicting, Chevron will attempt to resolve the discrepancy or disagreement by convening a meeting (or conference call) with representatives of the affected government agencies present. If the issue cannot be resolved, the condition of the NEB Certificate will apply. The Environmental Coordinator will participate in the discussions and record the outcome in the Environmental As-Built Report.

5.1 General Measures

1) The Environmental Coordinator will have the authority to make decisions regarding stoppage of work being done in an unsatisfactory manner at a specific location and improve mitigation measures (subject to conformance with permitting conditions). These decisions will usually be undertaken in consultation with other authorized personnel. The Chevron Site Coordinator(s) will make decisions about a spread-wide construction shutdown while taking into consideration the advice of the Environmental Coordinator. In the event that a consensus is not reached at the field level, the Environmental Coordinator will have recourse to the Project Coordinator who in turn will have recourse to the Chevron Construction Management.

2) Referenced protection measures that do not appear in Chevron's construction contract documents will be incorporated into the specifications for this project and will form an addendum to the contract document.

3) All necessary licenses and approvals will be obtained prior to start of construction, any inconsistencies between conditions of different permits will be resolved prior to the start of construction.

4) A pre-job meeting will be held with representatives from Chevron's construction, engineering, environmental and field inspection teams along with interested government regulatory personnel to review project concerns and to clarify required procedures.

5) All engine driven equipment will be outfitted with appropriate mufflers.

5.2 PIPELINE CONSTRUCTION

5.2.1 Incident Reporting, Waste Management and Hazardous Material

1) All releases to the environment must be reported to the appropriate regulatory body in accordance with the National Energy Board reporting requirements (Appendix 1 - NEB Detailed Incident Report). The Contractor shall report releases to Chevron's Environmental Coordinator who will in turn be responsible for ensuring that the releases are reported.

2) Release of 1 bbl or greater of substances such as refined product or unrefined crude must also be reported to Chevron's Release Inventory (Appendix 1 - Chevron GO-140). See Chevron's "Investigation Manual for Safety and Environmental Incidents" manual for complete procedures and definitions.

3) All wastes generated by a Contractor while conducting Chevron business shall be handled and disposed of according to Alberta Energy and Utilities Board Guide G58. The G58 Guide is the baseline used for waste management at this time. Chevron's Fort Liard Waste Management Plan (attached) will be discussed at the pre-job meeting and handling procedures and disposal practices decided upon prior to start of construction. Contractors will consult the Chevron Site Coordinator prior to transporting dangerous oilfield wastes on public roadways.

4) All hazardous products will be transported in accordance with the Transportation of Dangerous Goods (TDG) and Workplace Hazardous Materials Information System (WHMIS) regulations.

5) All onsite fuel and chemical storage tanks and containers greater than 250 litres will be located in an impermeable secondary containment area or will be of double walled construction in accordance with 1995 AEUB Guide G-55 (Storage Requirements for the Upstream Petroleum Industry).

6) Staging areas used for fuel and chemical storage will not be located within 30 metres of the normal high water mark of any wetlands and drainages.

7) The servicing and fueling of equipment will be restricted within 30 metres of streams, lakes and wetland areas and limited to stationary, immovable equipment involved in watercrossing activities, such as directional drill rigs, or bypass water pumps. All stationary equipment will be located within an impermeable secondary containment area.

8) Servicing of equipment will be conducted over an impervious tarp to contain spills. All fuel transport and servicing vehicles will carry a minimum of 10 kg of suitable commercial sorbent material for ground spills. Absorbent materials will be readily available to cleanup spills and disposed of in accordance with G-58 as described above.

9) All equipment that will be crossing watercourses or wetland areas will be inspected for fluid leads prior to entering.

10) Floating sorbent pads and booms for spill cleanup on open water will be kept readily accessible to the active construction spread.

5.2.2 Wildlife Protection

1) The feeding or harassment of wildlife will be prohibited. Construction personnel will not be permitted to have firearms or pets at any project related facilities or on the right-of-way. All food and wastes will be securely stored in vehicles and/or appropriate storage facilities.

2) The recreational use of snowmobile or all-terrain vehicles by construction personnel will not be permitted on the right-of-way or any other project related facilities.

3) Garbage and wastes will be collected daily for incineration and/or disposal at a location approved by RWED. GNWT literature on safety in Bear Country practices will be distributed to Contractors.

4) A number of salt licks occur in the project area, personnel will be alerted to a greater likelihood of encountering animals in affected construction areas. Contractors will be instructed to maintain safe speeds and be aware of potential encounters with wildlife, especially during night conditions where wildlife startled by vehicle headlights may continue to proceed down the travel corridor. Any accidents involving wildlife will be reported to the Environmental Coordinator and the RWED Renewable Resource Officer.

5) Speed limits will be posted and enforced.

6) Fisherman Creek, Creek 30 and Creek 20 will be crossed using a trenchless technique to reduce animal wintering habitat impact, protect bank integrity & instream habitat, and avoid downstream sedimentation potential. Drilling pads and workspace areas will be outside of the reparian areas to maintain an undisturbed buffer at the pipeline crossing point.

7) Construction in the vicinity of Fisherman Creek will be completed as expeditious as safety allows. Traffic will be limited to through traffic only to minimize disturbance to moose.

8) Storage of equipment will not be allowed in potential wildlife wintering areas such as Fisherman Creek area.

9) In areas of blowdown, the pipeline ROW will be kept to a minimum to avoid bear den habitat. Construction activities encountering a bear den will be stopped and the RWED Renewable Resource Officer will be notified.

10) Construction activities shall be limited to the surveyed ROW, leases, and roads to minimize habitat disturbance.

11) At approved intake locations, water intake will be properly screened as to prevent the entrainment of fish as per the Freshwater Intake End-of-Pipe Fish Screen Guidelines (1995) and DFO Fish Screening Directive.

5.2.3 Wetlands and Watercourse Crossings

1) Prior to start of construction, the right-of-way (ROW) and lease boundaries, including pre-approved temporary workspace, will be clearly staked by survey crews to prevent disturbance to unauthorized areas. Construction activities will be restricted to these areas, existing roads and approved shoe-flies.

2) Contractors will inspect all equipment for fluid leaks prior to entering or crossing over any wetland or watercourse area. All equipment that enters or passes over such areas shall be clean to ensure that deleterious material is not deposited.

3) Trenchless techniques will be used for all open or flowing water crossings.

4) To reduce damage from ROW traffic, all non-watercourse crossing related equipment will be routed around the larger watercourse valleys. Only equipment necessary for the installation of these crossings will be permitted within the wetland or watercourse valley.

5) Snowfill/ice bridges will be constructed of water drawn from the watercourse and/or clean snow plowed in from adjacent areas. Geo-textile with grade caps will be allowed for vehicle crossings if required. Grading to accommodate a vehicle crossing structure or provide access to the crossing will be minimized. Snow and ice access ramps or logs will be utilized to improve access to a vehicle crossing instead of grading.

6) If weather conditions will not support the construction of snowfill/ice bridges, then other temporary crossing structures approved by RWED and DFO authorities (e.g., temporary bridge spans, swamp mats, cabled log bundles) will be employed.

7) If approved, cabled log bundles will be constructed of approved timber with limbs and tops removed. The cable will be securely installed on one side of the watercourse and strung across the watercourse. The necessary number of logs with or without a culvert will be installed on top of the cable.

8) Snow clearing and frost packing will be undertaken along poorly drained sections of the ROW to drive frost into the ground as needed. Where frost penetration remains inadequate to support equipment travel, snow packing and water spraying will be used along with swamp mats or log corduroy to stabilize surface conditions. Sources to be used in order of preference for corduroy include:

i. non-merchantable timber cleared from the ROW
ii. merchantable deciduous timber cleared from the ROW
iii. merchantable coniferous timber cleared from the ROW
iv. non-merchantable timber cleared from off the ROW
v. merchantable timber cleared from off ROW areas

9) Use of timber from off ROW areas must be approved by RWED prior to commencement of clearing.

10) All trees will be felled away from a watercourse. Machine clearing is prohibited (ie. hand clearing only) within:

- 15 metres of watercourse banks for trenchless crossings. In addition, no clearing of any vegetation will occur within the buffer except that necessary for vehicle crossings.

- 5 metres of watercourse banks for opencut crossings (no open or flowing water).

11) The portion of ROW required for vehicle passage will be as narrow as possible (8 m or less). A portable bridge, snowfill/ice bridge, timber bridge or cabled log bundle and snow crossing will be used. Snowfill/ice bridges will be constructed of clean snow and ice. There will be no or very minimal grading to the crossing. Corduroy, snow and ice will be used to improve or gain access where possible. Disturbance to the stream bank will be kept to a minimum.

12) Trees, slash and soil inadvertently introduced into any watercourse or wetland area will be removed immediately.

13) Logs will not be skidded across any watercourse or wetland area unless a suitable temporary vehicle crossing structure such as a portable bridge, snowfill/ice bridge, or cabled log bundle is in place.

14) Any necessary grading of stream banks will be directed away from the active channel to minimize the potential for stream sediment loading. Wherever feasible, grading and grubbing of stream banks will be restricted to ditchline only. The Environmental Coordinator will review the necessary temporary erosion control measures (i.e., silt fencing, straw bales, etc.) to ensure that sediments do not reach the watercourse.

15) The directional drilling Contractor shall comply with the specifications for management of and disposal of any drilling fluid wastes associated with any drilled watercourse crossing. These wastes, if not recycled, will be removed a minimum of 100 m away from the high water mark of any watercourse area and be land spread or mixed, buried and covered as per specifications. The appropriate RWED and DFO approvals will be obtained prior to undertaking this disposal operation.

16) In the unexpected situation where there are inadvertent returns within the scour channel of the stream during a directional drill procedure, the Contractor will cease operations until the situation can be corrected by either starting a new hole or changing mud constituents.

17) If the stream is not supporting flow (i.e., dry or frozen solid) during the crossing period, Chevron will utilize an open-cut procedure. Bed disturbance will be limited to the width of the trench.

18) Flow will not be interrupted on any watercourse during any crossing activities.

19) Existing gravel or cobble substrates within a watercourse channel which undergoes a standard trenched or isolated trench crossing will be salvaged during initial instream ditching operations and stockpiled separately from the remaining ditch spoil. The coarse substrate will be used to cap the instream ditchline after backfilling.

20) On all watercourses undergoing a standard open cut or isolated trench crossing, no trench spoil will be placed in the active channel (or on the ice) during instream activities. Instream ditching will be completed by hoes working from the edge of the watercourse where feasible. Ditch spoil excavated from the channel will be stockpiled above the high water mark of the watercourse behind berms to prevent saturated material from re-entering the channel.

21) On larger watercourse crossing undergoing a standard open cut or isolated trench crossing, trench spoil will be placed in strategic locations mid-stream outside of the active channel.

22) Should bedrock be encountered in a major watercourse undergoing a standard trenched crossing, the Contractor will first attempt to excavate the bedrock utilizing the available equipment. Should the technique prove unsuccessful, the Contractor will immediately notify the Environmental Coordinator who will then notify RWED and DFO authorities. No blasting will be undertaken within a watercourse without prior approval. If obtained, all blasting will conform to DFO guidelines for use of explosives near fisheries waters.

23) Ditch dewatering will not be allowed on standard trenched crossings to minimize the potential of dewatering upstream or downstream overwintering areas.

24) During clean-up, snowfill/ice bridges will be scraped clean of spoil, slash, etc. inadvertently introduced onto the surface and will be physically broken up to prevent ice jams and subsequent flooding. Only the middle 60% of the bridge will be removed therefore leaving the 20% closest to either bank undisturbed. All temporary bridges, log bundles and/or culverts installed during construction will be removed completely.

25) All swamp mats will be removed completely.

26) At all watercourse crossings, banks will be restored to design grade with local material or gravel, blended in to the adjacent ground surface configuration and stabilized, armoured and revegetated, as soon as feasible following construction.

27) Where trenchless techniques are unsuccessful, approval for a Dam and Bypass Pump or Dam and Flume technique will be proposed. A back-up pump system of equal or larger capacity would be readily available at each crossing employing a Bypass Pump technique. All pump heads will screened in accordance Fish Screen Guidelines (1995) and DFO Fish Screening Directive.

28) If ditch dewatering is required in an isolated trench crossing, water will be pumped onto stable, well vegetated areas at least 50 m from the nearest watercourse. The mouth of the pump hose will be placed on polyethylene sheeting and directed at rocks, sandbags or other appropriate materials to reduce outflow velocities and erosion potential. The pump will be stationed on polethylene sheeting above the high water mark of the watercourse to capture any leaks.

5.2.4 Timber Clearing

1) In the event that a previously unknown archaeological or historical traditional use site is encountered, work will avoid further disturbing the area and the appropriate authorities will be notified and mitigation options discussed.

2) During the winter construction period, a snow road will be constructed on the working side of the right-of-way, especially in low-lying areas traversed by the pipeline route. Construction of this travel lane will comply with the methodology and guidelines identified in the DOT Handbook (GNWT 1993)

3) All equipment will be cleaned of mud and vegetative debris prior to start of construction to aid in the control of noxious weeds.

4) No permanent access trail/road will be built along the pipeline from the road west to the Westcoast tie-in.

5) Prior to start of clearing, the clearing personnel will be instructed to closely monitor survey flag positions throughout their activities in order to minimize off ROW violations.

6) Extra workspace required for the storage of snow, slash, strippings, merchantable timber or timber for rollback will be flagged prior to the clearing or use of such sites.

7) During clearing, trees will be felled into the surveyed ROW. Leaners or felled trees that inadvertently fall into adjacent undisturbed vegetation will be removed.

8) Timber deck sites will be located, approximately 800 m apart in timbered areas, on approved extra workspace. The sites will be located on or near existing access roads to expedite merchantable timber removal. No tree decks will be established at the bottom of steep slopes unless alternate access is available.

9) In timbered areas with moderate to steep slopes designated by the Environmental Coordinator, all non-merchantable timber and slash will be stockpiled for use as rollback for erosion control and/or access control. This material will be redistributed during clean-up.

10) All remaining logs and slash not salvaged from the ROW and extra workspace as merchantable timber or saved as rollback or corduroy will be disposed of by burning. The necessary burning permits will be obtained from RWED.

11) Salvaged timber will be felled, limbed and topped to the utilization standards of the local forest industry. Limbing will be done on the ROW. Any mechanical limbing and topping at the tree decks that results in slash accumulations under the salvaged trees can be:

- Immediately forwarded to decking area adjacent to a suitable road. Tops and limbs left for cleanup by burning, rollback or combination of both.
- Left till after the pipe is buried, then must be hauled or forwarded to a suitable road before clean-up. Tops and limbs will be burnt or used for rollback or combination of both.

12) No tree decks will be left with an accumulation of tops and limbs under them.

13) Salvage trees will not be skidded through muddy ground.

14) The Contractor will cooperate with the timber salvage operators to ensure that all decked timber can be removed from the ROW and transported to designated all weather access points prior to spring break-up.

15) All trees will be felled away from a watercourse. Machine clearing is prohibited (ie. hand clearing only) within:

- 15 metres of watercourse banks for trenchless crossings. In addition, no clearing of any vegetation will occur within the buffer except that necessary for vehicle crossings.

- 5 metres of watercourse banks for opencut crossings (no open or flowing water).

16) The portion of ROW required for vehicle passage will be as narrow as possible (8 m or less). A portable bridge, snowfill/ice bridge, timber bridge or cabled log bundle and snow crossing will be used. Snowfill/ice bridges will be constructed of clean snow and ice. There will be no or very minimal grading to the crossing. Corduroy, snow and ice will be used to improve or gain access where possible. Disturbance to the stream bank will be kept to a minimum.

17) Trees, slash and soil inadvertently introduced into any watercourse or wetland area will be removed immediately.

18) Logs will not be skidded across any watercourse or wetland area unless a suitable temporary vehicle crossing structure such as a portable bridge, snowfill/ice bridge, or cabled log bundle is in place.

19) On portions of the ROW where timber salvage is not required, trees and brush will be knocked down by dozers. If the volume of trees and brush is not large, this material will be windrowed on the spoil side and saved as rollback for erosion control and access restriction. If the volume is too large, a portion may be burnt in accordance with RWED before windrowing for rollback. The necessary burning permits will be obtained from RWED prior to burning.

20) Location of burn piles on peat rich areas will be avoided where residual fires could persist after construction. Burn piles will be located above the high water mark of any watercourse, lake or wetland area.

21) On areas where grading is required, extra work space will be required to maintain a 2 metre no disturb zone on each side of the ROW. No stripping or grading will be done on this 2 m zone. This area may be used to store stumps, slash and strippings - only to be removed by a hoe.

22) Gaps approximately 8 metres wide will be left in all snow berms and slash windrows at the crossings of all trapper's trails, general trails and every 400m to facilitate wildlife movement.

5.2.5 Stripping

Stripping and grubbing requirements will be dictated by ground conditions and terrain. In all instances, ground disturbance will be minimized.

Side Hills, Rough & Steep Terrain

- Full ROW stripping and grubbing will be required. With the frozen ground conditions, stump removal with a brush rake or dozer blade will bring the duff, organic and some of the B horizon to the surface. This material, along with slash and other surface debris, will be windrowed on undisturbed ground on the spoil side of the ROW. Snow can be plowed and mixed with this windrow. The top 10 to 20 cm of surface soil and organic layer will be windrowed against the stumps and slash for storage. These strippings will be kept separate from any grade dirt or spoil dirt from ditch excavation.

Flat & Relatively Flat Terrain

- When conditions are favorable (i.e., minor amount of clearing and an accumulation of snow), only a small amount of ground disturbance will be done. A compacted snow travel surface with hummocks dozed off will be created on the work side for travel. The excess snow, small trees and shrubs will be windrowed on the ROW boundary spoil side. Some of this snow may be temporarily stored on the travel side. This snow will be placed over the ditch line to slow down frost penetration. An area of approximately 3 m wide will be stripped of organic layer and soil to a depth of 10 to 20 cm over the ditch line. This mix of material presents a safety hazard to workers and will not be used for pipe makeup. It will be windrowed against the snow, debris, small trees and shrubs on the spoil side. A separation of this material and trench dirt will be maintained.

Muskeg

- Muskeg travel will be treated as above with a compact snow surface. Any trees or shrubs will be blade sheared and saved for rollback or burnt if there is a large quantity. Only the trench line will be stripped. If the muskeg soil does not extend to ditch depth, the underlying clay will be piled separately from the muskeg soil and used as first backfill.

1) Extra ditch width may be required in sandy textured soils. Ditch may be widened in these areas to accommodate potential slumping. Extra work space may be necessary to accommodate the extra soils removed and narrower ROW work surface and will be dealt with at that time by Chevron.

2) Several of the soils encountered are fine textured and are susceptible to soil compaction and rutting. Construction will address wet conditions as necessary. Full ROW stripping will be undertaken as a contingency measure to mitigate serious rutting or compaction concerns. ROW traffic will be minimized in these areas if feasible and it may prove necessary to rip and cultivate the work side of the ROW following construction.

5.2.6 Grading (includes grubbing)

1) Grading and root grubbing will be minimized wherever feasible, in order to maintain ground stability and encourage rapid vegetation regrowth following construction. If feasible, snow packing and water spraying will be undertaken instead of grading and grubbing in order to smooth off the work side or the ROW. Where steep side slopes and deep cuts are encountered, the ROW will be two-toned to minimize grading.

2) Extra workspace required during construction for grade spoil will be obtained prior to site clearing and/or use.

3) On portions of the ROW that require grading, the surface material will be salvaged and stored in windrows until required for reclamation. A clear separation will be maintained between strippings, topsoil and spoil dirt from grading and ditching.

4) On portions of the ROW where the Contractor elects to not grade the ROW after clearing, a brush rake or hoe will be utilized to grub roots and stumps, if necessary to smooth the ROW, without blading off surface materials. Grubbing will be minimized where feasible and will not be undertaken in muskeg areas.

5) Grading will be undertaken with the objective that original contours and drainage patterns will be re-established during clean-up.

6) Bar ditches adjacent to existing roadways which are to be crossed for construction will be adequately ramped with grade or ditch spoil to prevent damage to the road shoulder and ditch. Topsoil will not be utilized for ramps.

5.2.7 Ditching, Pipe Installation and Backfilling

1) Both the gas and the water pipelines will lie in a common trench with a minimum 30 cm separation (east side of the Franklin Range only).

2) Sufficiently sized gaps will be left in all windrows or raised pipe (if raised position for a period longer than 48 hours) at the crossings of all trails, access roads and obvious wildlife trails. Gap sizing will be approx. 8m. At pipe gaps where open ditch is encountered, ditch plugs will be installed and open ditch clearly flagged in these areas.

3) If ditch dewatering is required in high groundwater areas, water will be pumped onto stable, well vegetated areas at least 50 m from the nearest watercourse. The mouth of the pump hose will be placed on polyethylene sheeting and directed at rocks, sandbags or other appropriate materials to reduce outflow velocities and erosion potential.

4) If blasting is required, it will be conducted in accordance with all relevant regulations, permit stipulation and safety concerns. Blasting blankets/mats will be used to control fly-rock. The Contractor will comply with all Federal and GNWT legal requirements in connection with the use, storage and transportation of explosives.

5) Construction debris and other garbage will be continually collected and disposed of at an approved site. Construction debris or other garbage will not be deposited in the ditch at any time.

6) Ditch plugs will be installed on slopes as necessary (or where slopes are greater than 10%) to minimize the potential for the water movement along the ditch and subsequent erosion. Similarly, stub berms will be installed, as required, in high ground water areas to prevent ditchline water flows.

7) Trench excavation will occur immediately prior to lowering in pipe and the trench backfilled immediately to minimize habitat fragmentation.

8) During backfilling, the trench will be roached with all available spoil material to allow for settlement. Gaps in this roach will be left at obvious drainage channels to prevent alteration of natural surface drainage patterns.

5.2.8 Testing

1) Pneumatic testing will be used on a portion of the pipeline and a testing procedure will be submitted.

2) Water to be used in testing will only be withdrawn from approved waterbodies and discharged, as outlined in permits and approvals. Chevron will review the Contractors' water withdrawal, discharge and testing points. The necessary sample collections will be undertaken in advance of testing, at the start of testing and during discharge (if water tested) to determine compliance with the DFO and RWED requirements.

3) Where pumping equipment used for testing situated adjacent to watercourses, the equipment will be placed on bermed polyethylene sheeting capable of containing any potential fluid leaks.

4) Cutting of bed and/or banks, or removal of bank vegetation, or construction of bell holes and/or berms in support of water removal is not permitted unless specifically approved.

5) If water is to be shuttled to the testing point, only clean water tanker trucks will be utilized.

6) If water is to be discharged on land after testing, the water will be dissipated over a well vegetated area, temporary riprap or other stable surface material to minimize the potential for surface erosion in accordance with RWED and DFO requirements.

7) Water used for testing that becomes contaminated will be collected in tanks and disposed of at an approved location.

8) Any methanol to be used for testing will be securely stored in tanks positioned within impermeable berms as specified earlier.

9) Any methanol and/or water methanol mix used for testing will be recovered in tankage and disposed of according to requirements.

10) Debris/materials produced during pig runs will be collected and removed to an approved industrial waste disposal site.

5.2.9 Clean-up

1) Weather permitting, clean-up will occur immediately following backfilling operations.

2) All grade cuts will be restored to stable contours, approximating pre-construction condition where feasible.

3) Graded portions of the ROW will be recontoured and salvaged organic layer/organic material will be replaced. On slopes susceptible to water erosion, diversion berms and associated cross ditches, will be constructed to divert runoff into vegetated areas adjacent to the ROW. Berms will be constructed at a maximum 5 degree angle from the horizontal and extend from the trenchline to at least 2 metres onto undisturbed ground adjacent to the ROW. Prior to the redistribution of topsoil, the trench will be sufficiently roached to allow for settlement.

4) Grade material stripped from the ROW will be redistributed evenly over all stripped areas, with the exception of ditchline. Ditchline touch-up will be undertaken during final clean-up (fall 2000 and winter 2000/01), if backfill settlement has occurred.

5) In areas where topsoil compaction and rutting have occurred, the work side of the ROW will be ripped to the bottom of the compacted soils and the surface cultivated.

6) All materials stripped from the work side in shallow muskegs will be replaced.

7) Topsoil material stripped from the ROW will be redistributed evenly over all stripped areas. Touch-up will be undertaken during final clean-up. The Environmental Coordinator will determine whether secondary stripping procedures may be necessary if backfill settlement or surface erosion have occurred.

8) Slash stockpiled during clearing for use as rollback for access restriction will be distributed over selected portions of the entire width of the ROW.

9) On slopes where rollback slash and debris are used for erosion control, the material will be distributed over the ROW and compressed with machinery to promote good soil/slash contact and to reduce the fire hazard. The Environmental Coordinator will be responsible for ensuring adequate erosion and sediment control.

10) Ramps installed in bar ditches will be removed completely in order to discourage vehicle traffic along the ROW.

11) All bridges, fences and culverts will be restored to meet or exceed pre-construction condition.

5.2.10 Revegetation

1) A revegetation program will be undertaken immediately following clean-up. This program will be designed to:
   - control potential wind and water erosion
   - encourage rapid vegetation growth for weed species competition
   - establish vegetation that is compatible with surrounding vegetation and land use

2) To maintain the ecological integrity of the area, only those portions of the ROW that are susceptible to erosion will be seeded. The local First Nation Communities and RWED will be consulted to determine a suitable, acceptable and available seed mixture.
   - All seed utilized will be as clean as possible and have appropriate seed certificates which will be available for inspection.
   - The ROW will be monitored during the late spring of 2000 to identify areas requiring fertilizer and/or additional seed applications. If additional seeding is required, manual broadcast or aerial application will be employed, depending on the amount of seeding required.
   - Weed control measures will be undertaken along the ROW by Chevron as required.

5.2.11 Camp Operation

1) All camp sites will be located on level, stable ground, preferably on an existing cleared area.

2) Procedures for withdrawal of water for camp use will follow permits and conditions.

3) Sanitary wastes for the construction camps will be treated in septic tanks. The septic treated fluid and gray water will be pumped off. The sanitary sludge will be hauled to the Fort Liard sanitary lagoon.

4) Solid combustible garbage will be collected and secured daily, until incineration or disposal, to prevent the attraction of wild animals. Residue from incineration will be disposed of, along with non-combustible garbage, in an approved disposal location.

5) Upon abandonment, the camp site area will be cleared of all trailers, tankage, piping, cable, insulation, lumber, blockage, metal wastes, etc. and regraded to original contours.

5.3 WELLSITE FACILITIES

5.3.1 Incident Reporting, Waste Management and Hazardous Material

1) All releases to the environment must be reported to the appropriate regulatory body in accordance with the National Energy Board reporting requirements (Appendix 1 - NEB Detailed Incident Report). The Contractor shall report releases to Chevron's Environmental Coordinator who will in turn be responsible for ensuring that the releases are reported.

2) Release of 1 bbl or greater of substances such as refined product or unrefined crude must also be reported to Chevron's Release Inventory (Appendix 1 - Chevron GO-140). See Chevron's "Investigation Manual for Safety and Environmental Incidents" manual for complete procedures and definitions.

3) All wastes generated by a Contractor while conducting Chevron business shall be handled and disposed of according to Alberta Energy and Utilities Board Guide G58. The G58 Guide is the baseline used for waste management at this time. Chevron's Fort Liard Waste Management Plan (attached) will be discussed at the pre-job meeting and handling procedures and disposal practices decided upon prior to start of construction. Contractors will consult the Chevron Site Coordinator prior to transporting dangerous oilfield wastes on public roadways.

4) All hazardous products will be transported in accordance with the Transportation of Dangerous Goods (TDG) and Workplace Hazardous Materials Information System (WHMIS) regulations.

5) All onsite fuel and chemical storage tanks and containers greater than 250 litres will be located in an impermeable secondary containment area or will be of double walled construction in accordance with 1995 AEUB Guide G-55 (Storage Requirements for the Upstream Petroleum Industry).

6) Staging areas used for fuel and chemical storage will not be located within 30 metres of the normal high water mark of any wetlands and drainages.

7) Servicing of equipment will be conducted over an impervious tarp to contain spills. All fuel transport and servicing vehicles will carry a minimum of 10 kg of suitable commercial sorbent material for ground spills and disposed of in accordance with G-58 as described above.

5.3.2 Site Clearing and Grading

1) The storage of strippings and overburden are of a long term nature. These are required for restoration at the end of the project life. It is therefore necessary to document and map the location of this storage area.

2) A drainage control system to retain runoff on site will be constructed. The system design of berms, silt screens, rock armour, etc. will prevent facility runoff and/or any accidental spill directly entering any nearby watercourse.

3) The perimeter of the facility site will be fenced upon completion of construction to prevent conflict between wildlife, equipment and people.

National Energy Board
Calgary, Alberta

Appendix 1
DETAILED INCIDENT REPORT

Type or print in black pen

Board Use Only

NEB Incident No. _____ Date Received _____ NEB Investigator _____

Investigator's Comments _____

_____

_____

Secretary
National Energy Board
444 Seventh Avenue S.W.
Calgary, Alberta T2P 0X8 • Fax: (403) 292-5503

PART A - OPERATOR INFORMATION

Name of Company _____

Address of Company _____

_____

Pipeline Name _____

PART B - TIME, WEATHER AND LOCATION OF INCIDENT

Date *(month)* *(day)* *(year)*

Hour *(24 hour system & time zone)*

Weather *temperature:* *°C precipitation:* *windspeed & direction:*

CSA Class Location ☐1 ☐2 ☐3 ☐4

Location (provide specific location using a chainage description (MLV, kmP), land survey description or prominent landmarks)

_____

_____

_____

_____

PART C - ORIGIN OF SPILL/RELEASE

Facility Involved:

☐ Line Pipe ☐ Tank Farm ☐ Pump Station ☐ Compressor Station ☐ Regulator/Meter Station ☐ Gas Plant

☐ Other Related Facility *(specify)* _____

Equipment Involved:

☐ Pipe ☐ Valve ☐ Pressure relief device ☐ Fitting ☐ Compressor ☐ Pump ☐ Pressure vessel ☐ Tank

☐ Instrumentation

☐ Other *(specify)* _____

PART D - SPILLS AND RELEASES *(Report LVP and HVP spills only if in excess of 1.5 m^3)*

☐ Gas ☐ LVP ☐ HVP ☐ Toxic Substance

Name of product/substance _____

Volume spilled/released _____ m^3 Volume recovered _____ m^3

Was there a fire? ☐ Yes ☐ No Was there an explosion? ☐ Yes ☐ No

PART E - IMMEDIATE CAUSE FOR INCIDENTS ON OPERATING PIPELINES (*Immediate Cause: means unsafe acts or unsafe conditions*)

☐ Failed pipe ☐ Operator personnel error ☐ Other *(specify)* _____

☐ Failed weld ☐ External loading or natural forces Refer to Part H

☐ Corrosion Refer to Part G ☐ Equipment malfunction/failure Refer to Part I

PART F - LINE PIPE DATA

Type of Failure _____

Nominal Diameter (mm) _____ Wall Thickness (mm) _____ Date of Manufacture _____

Weld Process _____ SMYS (MPa) _____

Pipe Specification ☐ Z 245 ☐ Other *(specify)* _____ Pipe Location: ☐ Below Ground ☐ Above Ground

Maximum Operating Pressure (kPa) _____ Pressure at Time of Incident (kPa) _____

Latest Presure Test Date _____ Maximum Test Pressure (kPa) _____ Test Duration (hrs) _____

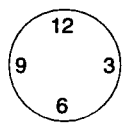
PART G - CORROSION FAILURES

Corrosion location: ☐ Internal ☐ External

Type of Corrosion *(specify)* _____

Type of Coating _____

Circumferential Position Looking Downstream (mark an X)



PART H - FAILURES DUE TO EXTERNAL LOAD OR NATURAL FORCES

☐ Damage by operator or its contractor ☐ Damage by other parties ☐ Earth movement ☐ Lightning/Fire

☐ Other (*specify*) _____

Name or Contractor/Other Party _____

Address _____

Telephone ( ) _____ Name of Representative _____

PART I - EQUIPMENT MALFUNCTION/FAILURE

Equipment _____ Manufacturer _____ Model# _____

Year Equipment Installed _____ Year Equipment Manufactured _____

PART J - ESTIMATE OF TOTAL INCIDENT COST *(Including repair, cleanup and restoration)*

$

PART K - REPAIR DESCRIPTION *(Description of all repairs to the pipeline made necessary by the incident and date of return to service of the pipeline)*

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

PART L - INJURY AND FATALITY DESCRIPTIONS

☐ Number of Fatalities ☐ Number of Serious Injuries

Serious Injury - includes an injury that results in: fracture of a major bone, amputation of a body part, loss of sight - one or both eyes, internal haemorrhage, third degree burns, unconsciousness, or loss of a body part or function of a body part

NAME	AFFILIATION	FATALITY OR INJURY DESCRIPTION AND CURRENT PATIENT CONDITION
	☐ Company Employee ☐ Contractor ☐ Public	
	☐ Company Employee ☐ Contractor ☐ Public	
	☐ Company Employee ☐ Contractor ☐ Public	
	☐ Company Employee ☐ Contractor ☐ Public	
	☐ Company Employee ☐ Contractor ☐ Public	
	☐ Company Employee ☐ Contractor ☐ Public	
	☐ Company Employee ☐ Contractor ☐ Public	
	☐ Company Employee ☐ Contractor ☐ Public	

PART M - IMMEDIATE INCIDENT CAUSE OF SERIOUS INJURY/FATALITY *(Immediate Cause - means unsafe acts and conditions)*

☐ Defective/inadequate safety devices, tools or equipment

☐ Improper operation of safety devices, tools or equipment

☐ Improper loading or placement

☐ Hazardous environment (gases, dust, smoke, fumes or vapours)

☐ Congested work area/disorderly workplace

☐ Other *(specify)*

PART N - NARRATIVE OF INCIDENT

Provide a complete description of the incident, including events leading up to, and following the incident. Also include additional information as specified in the guidelines to section 52 of the Onshore Pipeline Regulations. Attach any additional information that may supplement the narrative such as 1) drawing of the incident site 2) photographs 3) schematics 4) maps 5) reports (metallurgical, NDT, inspection, pressure test, etc.)

Attach additional sheets of narrative as required.

PART O - WITNESS INFORMATION

NAME _____ TELEPHONE NO. ( )_____

_____ ( )_____

_____ ( )_____

_____ ( )_____

_____ ( )_____

PART P - BASIC CAUSES OF INCIDENT ***(Identify all basic causes contributing to the incident. Basic Cause - means the real or root causes of why the unsafe acts and unsafe conditions as described in the immediate cause occurred. Several Basic Causes may be assigned for one incident.)***

☐ Inadequate training ☐ Inadequate work standards or procedures ☐ Inadequate materials, tools or equipment

☐ Inadequate design/maintenance ☐ Non-compliance with work standards or procedures

☐ Other *(specify)* _____

Additional comments on selected basic cause: _____

_____

_____

_____

PART Q - CORRECTIVE ACTIONS TAKEN TO PREVENT SIMILAR INCIDENTS ***(If no corrective action taken, state reasons why)***

_____

_____

_____

_____

_____

_____

_____

_____

PART R - NAME OF PERSON CONDUCTING A COMPANY INCIDENT INVESTIGATION

Name _____

Title _____

Telephone ( )_____ Fax ( )_____

PART S - NAMES OF OTHER AGENCIES INVESTIGATING INCIDENT

Agency _____ Agency _____

Telephone _____ Telephone _____

Contact Name _____ Contact Name _____

Agency _____ Agency _____

Telephone _____ Telephone _____

Contact Name _____ Contact Name _____

PART T - NAME AND TITLE OF COMPANY REPRESENTATIVE FILING REPORT

Name _____ Signature _____

Title _____

Telephone ( )_____ Fax ( )_____ Date *(time)*_____ *(month)*_____ *(day)*_____ *(year)*_____

Report of Oil and Hazardous Substances Release GO-140-1

Chevron

Number _____

Reporting Company	☐ Spill/Release ☐ Discovery of Underground Contamination	Date of Release or Discovery Time
Department Division		
Facility/Field Name	Receiving Medium(s) ☐ Air ☐ Ground Water ☐ Unlined Impoundment ☐ Land ☐ Subsurface ☐ Other ☐ Surface Water ☐ Lined Impoundment	Release Confined to Company Property ☐ Yes ☐ No
Incident Location		
Material Spilled/Released/Leaked		

Reported to the Following Government Agencies	Name of Person Reported to	Name of Company Person Who Made Report	Date and Time Reported
☐ ERCB (Alberta)			
☐ Energy and Mines (B.C., Sask., Man.)			
☐ Provincial Environment			
☐ Federal Agency - Name:			
☐ Other - Name:			

☐ Not Reported to a Government Agency

Quantity Released as:		Quantity Recovered*:
Crude	_____ m^3	_____
Produced Water	_____ m^3	_____
Refined Product	_____ m^3	_____
Produced/Natural Gas	_____ $10^3 m^3$	_____
Hazardous Substance	_____ kg	_____

*Removed from the Environment

Notice of Violation
☐ Yes ☐ No ☐ Not Known at this Time

Estimated Cleanup Costs

Estimated Restoration Costs

Estimated Lost Production (m^3/$10^3 m^3$)
(See reverse side for explanation)

ce

☐ Tank Aboveground ☐ Tank Underground ☐ Tank Truck ☐ Tank Car
☐ Sump ☐ Process or Pumping Equipment ☐ Piping
☐ Stack, Flare ☐ Well ☐ Pipeline/Flowline P/L Lic. No. _____
☐ Unknown ☐ Other _____

Causes
☐ Human Error ☐ Faulty Procedure ☐ Mechanical Failure ☐ Design Malfunction ☐ Unknown
☐ External Corrosion ☐ Internal Corrosion ☐ Act of God ☐ Non-Company ☐ Other _____

Describe how release occurred or how it was discovered and any effect it may have had on other's property. Discuss the degree of public, press or regulatory attention. Identify the company or contractor involved in non-company releases.

Describe assessment and remedial action taken and planned, and the disposal method and location of recovered material (if any).

Action Taken to Prevent Recurrence (if applicable).

Witness to Spill - Name	Company	Address (of Non-Chevron Witnesses)	
Report Prepared by	Date	Report Approved by	Date

Report of Oil and Hazardous Substances Release (GO-140-1)

Company Reports

The Corporate Environment Compliance Program requires that Form GO-140-1 "Report of Oil and Hazardous Substances Release" be prepared for:

a) Any spill/leak or release which is a violation.

b) Any spill/leak or release reported to a government agency.

c) Any oil spill/leak or release (not otherwise reportable) which is greater than 0.15 m^3 (1 barrel) in size.

d) Any spill/leak or release which has received or may receive public and/or news media attention.

e) Any non-Chevron spill/leak or release reported by Chevron to a government agency.

Form GO-140-1 should be prepared as completely as possible and may include extra pages, photographs or sketches if applicable. Personal observations are an important part of the report; however, statements should be brief, factual and devoid of speculation. Information regarding the cleanup cost, civil or other penalties paid, and information on surveillance and restoration of public or private property can be supplied at a later date if not available when the report is mailed.

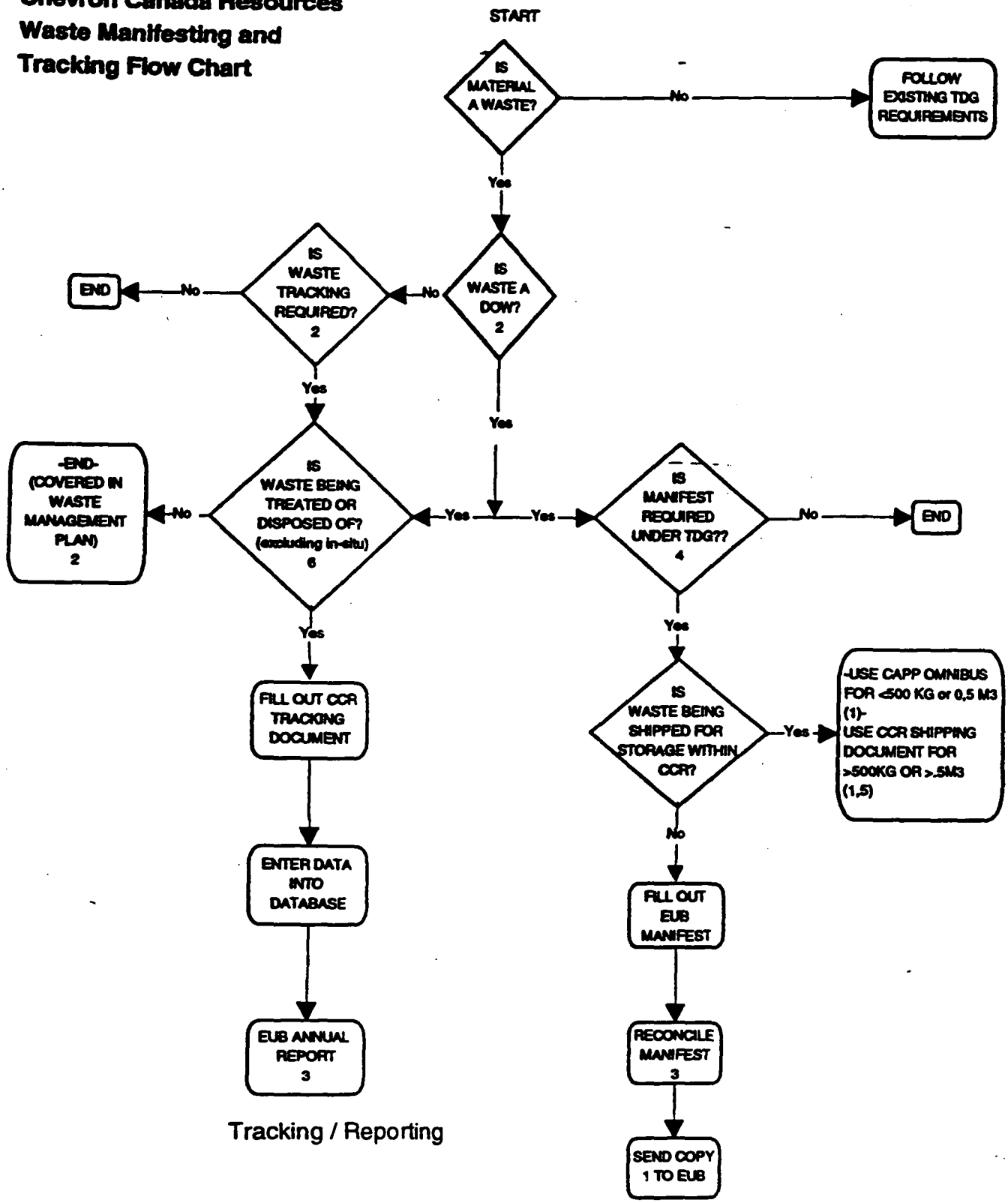
The pipeline licence number, including the line number, should be included when the source of the spill/leak or release is a pipeline or flowline.

Estimated Lost Production should include volumes released and not recovered, plus production volumes lost due to facilities being shut-in while repairs and cleanup operations are underway.

A copy of the Site Reclamation Documentation Form GO-140-2 should also be completed and attached to this report.

One copy of this report should be sent the Manager, Environment, Safety and Regulations Division. Other copies will be prepared and distributed as required by the Environment, Safety and Regulations Division.

Chevron Canada Resources
Waste Manifesting and
Tracking Flow Chart



1. CCR Hazard Materials Field Guide
2. Facility Waste Management Plan
3. EUB Oilfield Waste Management Requirements
4. Transportaion of Dangersous Goods Act and Regulations
5. CCR Shipping Document
6. In-Situ refers to material which is not physically excavated or moved

TDG REPORTABLE QUANTITIES	
Class & Division	Minimum Reportable Quantity
1.1 Mass explosive hazard	Any amount
1.2 Major projection hazard	Any amount
1.3 Mass fire hazard	Any amount
1.4 Localized explosion hazard	Any amount
1.5 Insensitive mass explosive hazard	Any amount
2.1 Compressed gas, flammable	At or in excess of 100 liters*
2.2 Compressed gas, non flammable, non poisonous, non corrosive	At or in excess of 100 liters*
2.3 Compressed gas, poisonous	Any amount
2.4 Compressed gas, corrosive	Any amount
3.0 Flammable liquids	At or in excess of 200 liters
4.1 Flammable solid	At or in excess of 25 kg
4.2 Spontaneously combustible	At or in excess of 25 kg
4.3 Dangerous when wet	At or in excess of 25 kg
5.1 Oxidizer	At or in excess of 1 kg or 1 liter
5.2 Organic Peroxide	At or in excess of 5 kg or 5 liters
6.1 Poisonous	Any amount
6.2 Infectious	Any amount
7.0 Radioactive	Any amount
8.0 Corrosive	At or in excess of 5 kg or 5 liters
9.1 Miscellaneous	At or in excess of 50 kg
9.2 Environmentally hazardous	At or in excess of 1 kg
9.3 Dangerous waste	At or in excess of 5 kg or 5 liters
Container capacity (liquid volume prior to release)	

CANADIAN ENVIRONMENTAL PROTECTION ACT REGULATED SUBSTANCES	
Prohibited	Organohalogen Compounds Mercury & Mercury Compounds Cadium & Cadium Compounds
Restricted	Arsenic & its Compounds Lead & its Compounds Zinc & its Compounds Chromium & its Compounds Nickel & its Compounds Vanadium & its Compounds Cyanide & its Compounds
Toxic	Asbestos Lead Mercury PCB

	RELEASE SPILL TYPE	REPORT TO	HOW	WHEN	INFORMATION REQUIRED
CUMULATIVE RELEASES TO PITS AND PONDS	Cumulative Releases in Any Amount of Unrefined Product that may cause an adverse effect * Contact your Environmental Advisor	AEUB Area Office	Verbal	Immediately	• Time and date of release or discovery • Lsd • Area Office • Company Name • Contact • Address • Phone no. • Source • Material type • Contaminant pathway • Release volume • On-lease or Off-lease • Public (white or green) or private lands • Adjacent land use • Clean-up activities • Landowner notification • Adjacent landowners impacted • Other government agency notifications
		AEP Director, Pollution Control Division	Written	Received by AEP Within 7 Days of Report to AEUB	• Date and time of release • Point of release • Location (Lsd) • Duration • Frequency and rate of release(s) • Composition of release material • Circumstances leading up to release • Steps taken to minimize, control or stop release • Steps taken to prevent recurrence
	Cumulative Releases in any amount of Refined Product that may cause an adverse effect. * Contact your Environmental Advisor.	AEP 1-403-422-4505	Verbal	Immediately	• As Per AEP Requirements Above for Cumulative Releas of Unrefined Product
		AEP Director, Pollution Control Division	Written	Received by AEP Within 7 Days	• As Per AEP Requirements Above for Cumulative Releas of Unrefined Product
RECLAMATION	At AEP Approved Facilities Contact your Environmental Advisor.	AEP Air & Water Approvals Division	Verbal	N/A	N/A
		AEP Director, Air & Water Approvals Division	Written	Prior To Starting Work (Recommend 48 Hrs)	• Lsd • Company Name • Contact Person • Well Status • Material treated on or off-site • On-site treatment method, if applicable • Have all other stakeholders in area been notified • Start date • Completion date
	At Non-AEP Approved Facilities Contact your Environmental Advisro	AEUB Area Office	Verbal	48 Hrs Prior To Starting	• As Per AEP Requirements Above
		AEUB Area Office	Written	N/A	N/A

FORT LIARD WASTE MANAGEMENT PLAN

CCR Operator Code: **Phone Number: 1-780-518-6172** **Fax Number: 1-403-660-2626** Date December 1, 1999

Facility Location: K29 **Facility Code:**

24 Hour Contact Number: 1-403-234-5971

Waste Information			Generation/Storage		Transportation (TDG Information)				Treatment, Recycle or Disposal Information					Annual Waste Estimate
CCR Waste Name	DOW, NDOW Testing Required	Tracking Required	Source Location	Storage Location	TDG Shipping Name	TDGA/PIN	TDG Class	TDG Packing Group	Common/Acceptable Disposal Methods (OWMR)	Recommended Disposal Method	Handling Code	Company	Location	Volume
Absorbents (Spent Socks, Pads)	NDOW (usually)	Yes	Various dehydrator and field locations	E.W.M. bin or drums @ K29 wellsite	Waste environmentally hazardous substances, solid, nos* ( )	UN 3077	9.2	III	Reuse, landfill at class 1a,1b, or II, thermal treatment	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	50 kg
Acetic Acid (glacial spent)	DOW	YES	Chemical flushes from vessels	400 bbl tanks @ K29 wellsite	Waste corrosive liquids, nos* ( )	UN 2789	9.2	II	Approved oilfield waste processing facility, inject down class 1 a/b , thermal treatment	Appropriate disposal well	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	Not an annual waste turnaround only
Activated Carbon (spent)	Testing Required	Yes	Various plant and field - dehydrator (TEG contaminated)	E.W.M. bin or drums @ K29 wellsite	Waste environmentally hazardous substances, solid, nos* ( )	UN 3077	9.2	III	DOW: thermal treatment, NDOW: landfill class I or II, Both: reuse	Incinerate @ Swan Hills.	17	Bovar	Swan Hills	200 kg
Aerosol Cans	NDOW	No	Various plant and field	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recycle if possible, ensure containers are empty and puncture	Recycle in Metal Bin	8	Chevron	Fort St. John B.C.	Minimal volume
Batteries: Alkaline	NDOW (dry) DOW (wet)	Yes (DOW) I No (NDOW)	various plant and field - alkaline batteries from flashlights, etc.	E.W.M. bin or drums @ K29 wellsite	DOW: Waste batteries, wet, filled with alkali, electric storage	UN 2795	8	III	Landfill in approved landfill (if NDOW and dry)	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	10 kg
Batteries: Lead Acid	DOW	Yes	various plant and field - vehicle and equipment batteries	E.W.M. bin or drums @ K29 wellsite	Waste batteries, wet, filled with acid, electric storage	UN 2794	8	III	Recycle, remove free liquids & neutralize & landfill in approved class I or class II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	100 kg
Batteries: NiCd	NDOW (dry) DOW (if containing KOH)	Yes	various plant and field - radios and other rechargeable devices	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated (unless contains KOH)	n/a	n/a	n/a	Recycle, remove free liquids & neutralize & landfill in approved class I or class II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	n/a
Construction and Demolition Material - uncontaminated	NDOW	No	various plant and field (cardboard boxes)	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recycle, reuse, landfill in approved landfill	Incinerate @ K29 site	18	Chevron	K29 Dehydrator	Note ash estimate on the final row
Containers -pesticide/herbicide	NDOW (if rinsed)	No (NDOW)	various plant and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated (if rinsed)	n/a	n/a	n/a	Recycle (pesticide container collection site); Rinse, crush, puncture and landfill at class 1a/b or II with a designated pesticide collection site	Incinerate @ Swan Hills.	17	Bovar	Swan Hills. AB	n/a
Contaminated Debris & Soil - Chemical Solvents	Testing Required	Yes	various plant and field	Soil bin as required	Variable	Variable	Variable	Variable	Therm. treat, phys./chem. treat, land treat, landfill in Class I or II landfill	Case by case specific	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	n/a
Contaminated Debris & Soil - Crude Oil / Condensate	Testing Required	Yes	various plant and field	Soil bin as required	Waste flammable solids, nos* ( )	UN 1325	4.1	II	Therm. treat, phys./chem. treat, land treat, landfill in Class I or II landfill	Case by case specific	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	n/a
Contaminated Debris & Soil - Produced/Salt Water	NDOW (unless contaminated with a DOW)	Yes	various plant and field	Soil bin as required	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	If onsite treat not possible, excavate and dispose at appropriate landfill	Case by case specific	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	n/a
Corrosion Inhibited Water	DOW	Yes	various plant and field	Waste storage tank at K29 wellsite	Waste flammable liquids nos* ( )	UN 1993	3	II	Inject down class 1a/1b disposal well (dependent on metals)	Appropriate disposal well	5	Chevron	Fort St. John BC LSD 15-5-83-17 W6M	50 M^3
Crude Oil / Condensate Emulsions	Testing Required	Yes	various plant and field (wellbores)	Waste storage tank at K29 wellsite	Waste flammable liquids nos* ( )	UN 1993	3	II	Approved oilfield waste processing facility, inject down class 1 a/b , thermal treatment	Appropriate disposal well	18	Chevron	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility

Waste Information			Generation/Storage		Transportation (TDG Information)				Treatment, Recycle or Disposal Information					Annual Waste Estimate
CCR Waste Name	DOW, NDOW Testing Required	Tracking Required	Source Location	Storage Location	TDG Shipping Name	TDGA/PIN	TDG Class	TDG Packing Group	Common/Acceptable Disposal Methods (OWMR)	Recommended Disposal Method	Handling Code	Company	Location	Volume
Crude Oil Sample Bottles	NDOW	No	various plant and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	Reuse; Recycle; Rinse and landfill at Class 1 a/b, II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	This waste is not anticipated at this facility [1]
Desiccants - spent (all types)	NDOW (usually - instrument air)	Yes	Various Plant - instrument air	Warehouse	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	DOW: properly contain & landfill Class I a/b landfill. NDOW: reuse, recycle, properly contain landfill in I a/b or II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	10 kg
Domestic Sewage Effluent	NDOW	No	Battery	Septic tank	Not TDG regulated	n/a	n/a	n/a		Irrigated	N/A	n/a	n/a	180 M^3
Domestic Sewage Sludge	NDOW	No	Battery	Septic tank	Not TDG regulated	n/a	n/a	n/a			N/A			Not an annual waste
Empty Containers (metal and plastic including drums, pails, jugs, etc.) - (Refundable)	NDOW (usually)	No	Various plant and field	Barrel dock @ K29 wellsite	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	Return to supplier; Recycle, Rinse, crush & landfill in class I a/b or II landfill	Return to Supplier	16	various	various	n/a
Empty Containers (metal and plastic including drums, pails, jugs, etc.) - (Non-refundable)	NDOW (usually)	No	Various plant and field	Barrel dock @ K29 wellsite	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	Return to supplier; Recycle, Rinse, crush & landfill in class I a/b or II landfill	Metal - rinsed, crushed & recycled. Plastic - rinsed & incinerated	16	various	various	Minimal volume
Filters - Glycols (EG/TEG)	DOW	Yes	Battery - dehydrator (TEG)	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	Recycle (metal recovery), Thermal treatment, remove entrained liq., contain & landfill in Class I a/b landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	25 kg
Filters - Lube Oil	DOW (undrained) NDOW (drained)	Yes	Battery - compressors, water pumps	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated, if drained, Waste type 201, if undrained	NA 9500	9.3	III	Recycle (metal recovery), Thermal treatment, drain liquids & landfill in Class I a/b landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	20 kg
Filters- Other (instrument air.)	DOW (gas, NGL)	Yes	Instrument air compressors.	Garbage bin @ K29 wellsite	Waste filter uncontaminated with flammable liquids	UN 1993	3.3	I	Recycle (metal recovery), Thermal treatment, remove entrained liq., contain & landfill in Class I a/b landfill	EWM waste bin	8	EWM	Swan Hills AB.	n/a
Filters - Water Treatment	NDOW	Yes	n/a	n/a	Not TDG regulated	n/a	n/a	n/a	NDOW; landfill at class I a/b or II landfill	n/a	N/A	n/a	n/a	n/a
Fluorescent Tubes: Spent	NDOW	No	M.C.C. / Control room	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Landfill in approved landfill, class Ia, Ib, II or III	Incinerate and landfill ash	8	Chevron	K29 Dehydrator	Note ash estimate on the final row
Garbage - domestic waste	NDOW	No	Control room / house.	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	landfill in approved landfill, class Ia, Ib, II or III	Incinerate and landfill ash	8	Chevron	K29 Dehydrator	Note ash estimate on the final row
Gaskets	NDOW	No	Battery and field locations	Garbage bin @ K29 wellsite	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	Landfill in approved landfill, class Ia, Ib, II or III	Metal recycle or incinerate	8	Chevron	K29 Dehydrator	Note ash estimate on the final row
Glycol Solutions (EG/TEG) - (heavy metals)	DOW	Yes	Battery - dehydrator (TEG)	Remains in Process	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	DOW or NDOW: recycle, inject in disp. well Class I or II, thermal treat.	Inject to appropriate well or recycle	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [1]
Glycol Solutions (EG/TEG) - (no heavy metals)	Testing Required	Yes	Battery - dehydrator (TEG)	Remains in Process	Not TDG regulated unless contaminated with a DOW	n/a	n/a	n/a	DOW or NDOW: recycle, inject in disp. well Class I or II, thermal treat.	Inject to appropriate well or recycle	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [1]
Grease Cartridges	NDOW	No	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Landfill in an approved Class I a/b, II landfill.	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	5 kg
Hydraulic and Transmission Oil (vehicle and equipment)	NDOW (usually)	Yes	Various: battery and field	Storage containers in warehouse	Waste Type 201	NA 9500	9.3	III	Recycle (licensed), thermal treatment	Recycle	15	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	n/a
Insulation - non asbestos	NDOW	No	Various: battery and field	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	NDOW: approved landfill	Landfill large volumes through EWM or Newalta	8	Chevron		This waste is not anticipated at this facility [1]
Lab Chemicals - Organic	DOW	Yes	Various Plant and Field (varsol)	Lab drain tank	Waste flammable liquids nos* (naphtha petroleum)	UN 1993	3	II	Reuse, recycle, thermal treatment	Recycle	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility

Waste Information			Generation/Storage		Transportation (TDG Information)				Treatment, Recycle or Disposal Information					Annual Waste Estimate
	DOW, NDOW	Tracking						TDG Packing	Common/Acceptable	Recommended Disposal	Handling			
CCR Waste Name	Testing Required	Required	Source Location	Storage Location	TDG Shipping Name	TDGA/PIN	TDG Class	Group	Disposal Methods (OWMR)	Method	Code	Company	Location	Volume
Liquids - Turnaround Wastes	DOW/NDOW	Yes	Various Plant and Field (varsol)	n/a	Waste flammable liquids, nos* ( )	UN 1993	3	I	Approved oilfield waste processing facility, inject class 1a or 1b, thermal treatment	Recycled; Well disposal	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	Not an annual waste turnaround only
Office Material (paper)	NDOW	No	Control room	Control room	Not TDG regulated	n/a	n/a	n/a	Recycle or landfill in approved landfill	Recycle or incinerate	16	Chevron		100 kg
Paint Cans (empty) and Brushes	NDOW	No	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Landfill in an approved Class I a/b, II landfill.	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	This waste is not anticipated at this facility [2]
Pigs (used)	NDOW	No	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recycle, landfill at class I a/b or II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	500 kg
Pesticides/Herbicides Spent	DOW	Yes	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Waste herbicides, liquids, toxic, nos* ( )	UN 2902	6.1	III	Waste exchange, thermal treatment, approved toxic roundup	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	n/a
Photo Copier / Laser Printer Toner	NDOW	No	Photo Copier / Fax machine	Garbage bin @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recycle, approved landfill class Ia, Ib, II or III	Recycle to manufacturer	8	Chevron		3 cartridges
Pigging Waste - Liquids	DOW (usually)	Yes	Pipelines	Waste storage tank at K29 wellsite	Waste flammable liquids, nos* ( )	UN 1993	3.3	I	Recovery (hydrocarbon), thermal treatment	Recycle to Oilfield recycler	16	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [2]
Pigging Waste - Wax and solids	DOW (usually)	Yes	Pipelines	Newalta bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recovery (hydrocarbon), thermal treatment	Thermal treatment or appropriate landfill	15	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [2]
Pipe Dope Containers and Brushes	NDOW (if empty and dry)	No	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	DOW or NDOW: return to supplier, recycle, rinse & landfill in class I a/b, II landfill	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	10 kg
Pipe Dope/Greases - Lead Based	DOW	Yes	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Leachable toxic waste (L17)	UN 9500	9.3	III	Recycle, thermal treatment, landfill at class Ia or Ib	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	0
Pipe Dope/Grease - Non lead Based	NDOW	Yes	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Not TDG regulated	n/a	n/a	n/a	Recycle, thermal treatment, landfill at class Ia or Ib	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	10 kg
Pipe sleeves	NDOW	No	Pipeline construction	K29 site	Not TDG regulated	n/a	n/a	n/a	landfill in approved landfill, class Ia, Ib, II or III	Incinerate and landfill ash		Pipeline contractor		Note ash estimate on the final row
Plant Surface Runoff - contaminated	Yes (DOW) [4]	No (unless contaminated with a DOW)	Various: battery and field	N/A	Not TDG regulated	n/a	n/a	n/a	Inject down class 1a/1b disposal well depending on pH.	Inject to Class I a/b disposal well	4	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	None
Plant Surface Runoff - uncontaminated	NDOW	No	Various: battery and field	On locations	Not TDG regulated	n/a	n/a	n/a	Inject down class 1a/1b disposal well depending on pH or test and release	Test pH & Chlondes and release	N/A	Chevron	various	Annual rainfall accumulation
Process Wastewater (floor drains, building drains, oily water sewers, etc.) (with heavy metals)	Testing Required	Yes[1]	Equipment washings	n/a	Not TDG regulated (unless contaminated with a DOW)	n/a	n/a	n/a	Inject down class 1a/1b disposal well depending on pH and if metal content < G51 criteria	Inject to appropriate disposal well	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	None
Process Wastewater (floor drains, building drains, oily water sewers, etc.) (with organic chemicals)	Testing Required	Yes5	Equipment washings	n/a	Not TDG regulated (unless contaminated with a DOW)	n/a	n/a	n/a	Inject down class 1a/1b disposal well depending on pH.	Inject to appropriate disposal well	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	5 M^3
Produced Water	NDOW (unless contaminated with a DOW)	No (NDOW)	Various: battery and field	Waste storage tank at K29 wellsite	Not TDG regulated (unless contaminated with a DOW)	n/a	n/a	n/a	Inject down Class I or II disp. well	Inject to appropriate disposal well	4	Chevron	Chevron O80 injection well	25000 M^3 Annual production estimate
Rags - Oily	NDOW (usually)	No (NDOW)	Various: battery and field	E.W.M. bin or drums @ K29 wellsite	Waste flammable solids, nos* ( )	UN 1325	4.1	II	DOW: thermal treatment, NDOW: reuse (launder/dry clean), landfill class I or II	Incinerate @ Swan Hills.	17	Bovar	Swan Hills AB.	50 kg
Scrap Metal (Galvanized, Aluminum, Stainless Steel, etc.)	NDOW	No	Various: battery and field	n/a	Not TDG regulated	n/a	n/a	n/a	DOW: decontam. & recycle, landfill Class I a/b landfill NDOW: recycle, landfill in class I a/b, II or III landfill	Recycle	16			1000 kg
Sludge - Glycol (TEG/EG), Gas Dryer Systems	DOW	Yes	Battery - dehydrator (TEG)	Left in Process	Waste solids containing flammable liquids, nos* ( )	UN 3175	4.1	II	phys./chem. treat., land treat., thermal treat., inject Class I a/b disp. well (glycol < 40 %)	Recovery, thermal treatment	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [2]

Waste Information			Generation/Storage		Transportation (TDG Information)				Treatment, Recycle or Disposal Information					Annual Waste Estimate
CCR Waste Name	DOW, NDOW Testing Required	Tracking Required	Source Location	Storage Location	TDG Shipping Name	TDGA/PIN	TDG Class	TDG Packing Group	Common/Acceptable Disposal Methods (OWMR)	Recommended Disposal Method	Handling Code	Company	Location	Volume
Sludge - Hydrocarbon (tanks, treaters, separators, ponds, flare, etc.)	Testing Required	Yes	Battery - flare KO, inlet separator, slop oil tank, production tanks	Left in Process	Waste solids containing flammable liquids, nos* ( )	UN 3175	4.1	II	Oilfield waste processing facility; thermal treatment; Class I a/b, II landfill	Recovery, thermal treatment	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	Not an annual waste turnaround only
Solvents - spent	DOW	Yes	Various Plant and Field (varsol)	Storage containers in warehouse	Waste flammable liquids, nos* (naphth petroleum)	UN 1993	3	II	Recycle (licensed), thermal treatment	Recycle	3	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	200 liters
Thread Protectors (Metal & Plastic)	NDOW	No	Various: battery and field	Warehouse K29 site	Not TDG regulated	n/a	n/a	n/a	Reuse, recycle, landfill at class 1a,1b,II, or III	Recycle	16	Various Suplliers	various	This waste is not anticipated at this facility [9]
Used Lubricating Oil	NDOW (usually)	Yes	Battery - compressors, water pumps	Used lube oil tank	Waste Type 201	NA 9500	9.3	III	recycle (licensed), thermal treatment	Recycle	15	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	4 M^3
Wash Fluids (process areas, vessels, other)	Testing Required	No (NDOW)	Various: battery and field	n/a	Not TDG regulated (unless contaminated with a DOW)	n/a	n/a	n/a	Recycle, recover HC and inject down Ia or Ib disposal well	Inject to Class Ib disposal well	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	Not an annual waste turnaround only
Wash Fluids - equipment cleaning operations	Testing Required	No (NDOW)	Various: battery and field	n/a	Not TDG regulated (unless contaminated with a DOW)	n/a	n/a	n/a	Recycle, recover HC and inject down Ia or Ib disposal well	Inject to Class Ib disposal well	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	Not an annual waste turnaround only
Wash Fluids - uncontaminated (water)	NDOW	No	Various Plant and Field - equipment washing/floor drains	n/a	Not TDG regulated	n/a	n/a	n/a	Recycle, recover HC and inject down Ia or Ib disposal well	Inject to Class Ib disposal well	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	2 M^3
Welding rods	NDOW	No	Construction of facilities	Warehouse K29 site	Not TDG regulated	n/a	n/a	n/a	Approved landfill class Ia, Ib, II or III	Determine volume and landfill as appropriate. Determine landfill requirements for large volumes				0.2 M^3
Well Workover Fluids (spent acid, HC, etc.)	Testing Required	Yes	Various: battery and field	Various: battery and field	Waste corrosive liquids, nos* ( )	UN 1760	8 (9.2)	II	Inject down Ia (pH 4.5-12.5) or Ib (pH 8.0-9.0) disposal well	Inject down appropriate well	5	Newalta	Fort St. John BC LSD 15-5-83-17 W6M	This waste is not anticipated at this facility [9]
X-ray film - unused and spent	NDOW (usually)	No (NDOW)	Various: battery and field	Warehouse K29 site	Not TDG regulated	n/a	n/a	n/a		Store for 3 years , landfill in approved.	8	Chevron	K29 Dehydrator	Not an annual waste
Incinerator ash	NDOW	No (NDOW)	K29 Dehydrator site domestic waste incineration	K29 site	Not TDG regulated	n/a	n/a	n/a		Landfill in approved landfill.		Chevron	Ft Liard	5.5 M^3

Notes

1. Tracking is required if battery is wet, alkali filled. Dry batteries are excluded.
2. Tracking is not required unless the construction material is contaminated with a DOW.
3. Incinerator ash must be tracked if the incinerated material is reportable.
4. Plant surface runoff does not need to be tracked unless the runoff is contaminated with a DOW. Fill in release analysis forms.
5. Process wastewater will normally be tracked as it will contaminated with organics, chemicals or metals.
6. Salt bath medium is not trackable as long as it is a NDOW.
7. Sand blasting sand is not trackable as long as it is not contaminated with a DOW.
8. Not trackable unless contaminated with a DOW.
9. This waste is not anticipated, however it remains in the waste management system in to assist in tracking in theevent it does occur

Note: If there is any question regarding the appropriate TDG shipping name, PIN, Class or Packing Group, consult the Transportation of Dangerous Goods Act and Regulations.

6.0 Safe Work Practices

This section includes several Chevron safe work practices. Upon Contractor selection, the Contractor shall provide written safe work procedures for any potentially hazardous tasks.

Chevron safe work practices include:

- Safe driving rules and recommended practices
- Fall prevention
- Hoisting with mobile equipment & critical lifts
- Trenching safety
- Pile driving with a backhoe
- Hot work
- Pipeline crossing safety

COMPANY RULES AND RECOMMENDED PRACTICES FOR DRIVING

The Safe Driving Program rules and recommended practices are intended to preserve the health and safety of all Chevron employees, its contractors, the public and to protect Company assets.

All drivers must comply with these rules. Non-compliance may result in disciplinary action.

Recommended practices should be followed. Non-compliance may also result in disciplinary action.

RULES

- A valid driver's license is **mandatory** for jobs which require driving. Loss of this license will trigger progressive discipline, including termination.
- Wear seat belts.
- Drive with the headlights on.
- Any motor vehicle accident must be reported **immediately** and a written report to the individual's supervisor within 24 hours.
- Nylon tow ropes or straps must not be used with metal or chains attached to the ends.
- All Company - owned or long - term - leased (i.e. six months or more) vehicles require animal alert whistles.
- Any person under the influence of alcohol or a controlled substance is prohibited from operating a vehicle. Employees must inform their supervisor if they are taking any medication which could affect their ability to drive.

RECOMMENDED PRACTICES

- Under ideal driving conditions, drivers should not exceed the posted speed limits. When conditions are less than ideal, speed should be adjusted downwards.
- Back onto parking stalls.
- Walk around vehicle prior to driving.
- Avoid driving when:
    - visibility is poor due to fog, heavy snow or rain.
    - fatigued, regardless of the hours worked.
    - road conditions are poor.
    - appropriate vehicle is not available.
- Plan travel to minimize driving between dusk and dawn.
- Identify high hazard roads.
    - Where there is more than one route to a destination use the least hazardous. Restrict traffic or close the other route until the unacceptable hazard is eliminated.
    - Use signs to identify high incident locations or specific hazards.
- Avoid using a hand held cellular or mobile phone while driving
- Manage total driving exposure by reviewing work schedules, hours and consecutive days worked

06/11/98

Fall Prevention - Safe Work Practice

Purpose:

The following is an overview of the current regulations and Chevron standards which apply to working at heights. It is intended to be used as a guide in all Chevron construction activities to ensure safe working conditions at elevated locations. It does not include the regulations which apply to permanent structures such as stairways and walkways constructed as part of Chevron facilities.

Regulatory Requirements:

- Alberta OH&S General Safety Regulation, Consolidated April 20, 1995. Sections are specified below.
- CSA Standard Z259.1-1976, "Fall Arresting Safety Belts and Lanyards for the Construction and Mining Industries"
- CSA Standard CAN/CSA Z259.10-M90 "Full Body Harnesses"
- CSA Standard CSA Standard CAN 3-Z11-M81, "Portable Ladders".

References:

- Safety in Design, Section 7 - Scaffolding, Chevron Corporation, Revised Jan. 1986.
- Scaffolds in Alberta, The Scaffold Industry Association of Canada, The Alberta Construction Safety Assoc., and Alberta OH&S.

Guidelines:

Falling Hazards: (OH&S Sections 21, 59, 62, 90-92)

Where it is possible for a worker to fall a vertical distance greater than 3.5m from a temporary work area, he shall be protected with one of the following:

1. **Guardrails** constructed of 2 X 4 lumber within the following parameters:
   - a horizontal top member between 0.90 and 1.1m in height.
   - a horizontal intermediate member mid-way between the top member and the base.
   - vertical members not more than 3m apart and at both ends of horizontal members.
   - designed to resist a force of 200 lb. applied anywhere along the length.

2. **Safety Nets** constructed of:
   - 9 mm #1 Grade pure Manila rope with a mesh size no greater than 150 X 150 mm.
   - shackles to have load arresting capacity of 17.8N
   - extends at least 2.4m beyond and no more than 6m below the work space.
   - does not contact another surface at maximum deflection.

3. **Personal Fall Arresting System** consisting of an anchorage point, connectors and some or all of the following:
   I. **Life-line and/or lanyard** conforming to **CSA Z259.1 1976.**
   II. **Harness or Safety Belt** conforming to **CSA Standard CAN/CSA Z259.10-M90.** *(Note: OH&S does not allow the use of safety belts in a situation where a worker could be suspended in the air by the belt. Belts are to be used only in the prevention of workers from actually falling and becoming suspended.)*
   III. **Shock Absorber (rope grab)**

   All personal fall arrest systems shall:
   - be protected from sharp edges, abrasion, heat, flame, and corrosive materials.
   - be made of material capable of withstanding the shock load.
   - be attached to a fixed **independent** anchor capable of supporting the shock load.

Fall Prevention - Safe Work Practice

- use snaphook connectors with self-closing, self- locking keepers.
- not pass through any obstruction which could cause a danger in the event of a platform failure.
- be rigged such that a worker can neither free fall more than 1.8m nor contact any lower level.
- be properly adjusted to fit the worker securely.
- have a load arresting capacity of 17.8 kN

The personal fall arresting system shall also be provided and used by each worker on **ALL** manually operated work platforms, suspended powered work platforms, single suspension cages, man baskets, and basket chairs regardless of height.

Exceptions: The above regulations apply to all employees except for those competent in the application of roofing materials to a flat roof and iron workers certified by the Alberta apprenticeship program.

Protection from Falling Objects: (OH&S Sections 63 & 64)

Where a danger to a worker's safety exists or may exist from falling objects, one of the following shall be employed:

I. overhead protection which can withstand the shock loads from falling objects
II. appropriate and adequate warning signs.
III. toe boards not less than 140 mm in height on temporary scaffolding or work platforms where it is possible for materials to fall more than 3.5m.

Temporary Stairs and Ladders: (OH&S Section 73-77, 79)

An employer shall ensure a safe means of access to and egress from every temporary work area. This may include:

1. **Stairs** with:
   - steps at least 600 mm wide.
   - Level treads of uniform width
   - uniform height of rise on steps throughout the length of the stairway.
   - handrails extending the entire length of the stairway at a height of 800 to 920 mm.
   - railings constructed of 2X4 lumber.

2. **Ramps** which:
   - are strong enough to withstand any traffic to which it may be subjected
   - have a minimum width of 600 mm but are wide enough to ensure the safe movement of equipment and workers.
   - have adequate provision to maintain traction
   - have guardrails if falling hazards exist

3. **Portable Ladders** with includes step and extension ladders. They shall:
   - comply with CSA Standard CSA Standard CAN 3-Z11-M81, "Portable Ladders".
   - be equipped with non-slip devices at the foot
   - be secured against movement with the base of the ladder no further than 1/4 the length of the ladder from the base of the wall.
   - extend at least 1m above any platform or landing when used as a means of access.

Fall Prevention - Safe Work Practice

Step Ladders shall:

- have legs securely held in position by means of a rigid support.
- when in the open position, have a front section that is no stepper than a ratio of 6:1.

Extension ladders shall:

- be equipped with locks which hold the sections firmly in position.
- have an overlap not less than 1m on extended sections.

No worker shall work from the either of the top 2 rungs of a portable single, step or extension ladder.

4. **Construction Ladders** which are generally fabricated on site shall conform to the following parameters:
   - not painted.
   - not made by fastening cleats across a single rail or post.
   - side rails on ladders up to 5m in length be constructed of 2X4 lumber.
   - side rails on ladders over 5m in length be constructed of 2X6 lumber.
   - rungs constructed of solid lumber measuring not less than 1X4, held by filler blocks or secured by a single continuous wire, and uniformly spaced 250 to 300 mm apart.
   - minimum width between side rails of 500 mm
   - two-way construction ladders must be minimum 1 m in width with a center structural rail along the length of the ladder.

Scaffolding, Work Platforms and Temporary Supporting Structures: (OH&S Part 9)

Although many types of scaffolding exists, the most common type used in the construction industry is the standard frame scaffold. It is constructed of prefabricated components consisting of the tubular frame, vertical braces, aluminum/plywood hook-type platforms and guardrails. A typical scaffold is shown in Figure 1.

For more complex scaffolding, the tube and clamp scaffolding may be used. Special care must be taken to ensure that this type of scaffolding is used according to the manufacturer's specification. The design requirements of tube and clamp and wood pole scaffolding is covered in Section 7 of the Chevron Safety in Designs handbook. Other types of scaffolding such as half-horse and outrigger are outlined in OH&S General Safety Regulation, Part 9.

Attached is a checklist for the inspection of scaffolding. It includes all relevant guidelines from OH&S for the safe erection and use of self-supporting frame type scaffolding.

Elevated Platforms and Aerial Devices: (OH&S Section 163)

This section outlines the guidelines for vehicle mounted, self-propelled and portable powered elevating platforms and telescoping units used for positioning a man basket or bucket at an elevated work location.

Requirements for these machines are as follows:

- controls for the positioning of a basket or bucket equipped with positive pressure controls.
- power units equipped with positive drives for both raising and lowering the basket.
- equipped with an interlocking device to limit the movement forwards or backwards when the height of the platform exceeds that specified by the manufacturer.
- all personnel working in baskets or buckets be equipped with a **personal fall arresting system.**

Fall Prevention - Safe Work Practice

No.	Scaffold Inspection Item	Yes	Action
1	Scaffold erection square, straight and level in all directions		
2	All scaffold components present, tight and secure		
3	Scaffold constructed and maintained according to manufacturer's specifications.		
3	Foundation: • Solid base free of soft soil or loose fill. • Clear of embankments. • Base plates of all legs centered and firmly supported on mud sills where soil may settle. • Mud sills extend at least 600 mm beyond base plates. • Leveling adjustment screws extended less than 0.3m and lock nuts tightened. • Rolling scaffold wheel brakes locked.	____ ____ ____ ____ ____	
4	Frame: • All vertical frame joints pinned • All braces properly locked or pinned • Adequate vertical and horizontal braces to provide against lateral movement. • Height to base ratio of 3 to 1 maintained • Tower anchored to rigid support horizontally every 6.4m and vertically every 4.6m. • Anchor ties capable of sustaining lateral loads in both tension and compression	____ ____ ____ ____ ____	
5	Platform: • Constructed of No.1 - 2" X 10" material (spruce, pine, fir) • Planks in good condition free of slits, knots or dry rot • Maximum span 2.3m for heavy work and 3.1m for light duty. • Planking secured from sliding. • Planking extends no less than 150 mm and no more than 300 mm beyond the supports. • Work space minimum of 500 mm wide • Clear and uncluttered. • Aluminum/plywood platforms known to have 75 lb./square ft capacity rating from manufacturer.	____ ____ ____ ____ ____ ____ ____	
6	Guard rails: • Provided for platforms 3.5m or higher above the ground • 0.90 to 1.10m in height • Provided with a mid-rail. • Platform perimeter toe board 140 mm in height at elevations of 3.5m or greater.	____ ____ ____	
7	Ladders: • Ladder rungs built into frame not more than 305 mm center to center. • Portable ladders used when planks project past the frame. • Portable ladders securely fastened to frame. • Portable ladder rails extend 1m above platform with a base offset from frame less than 1/4 of its height. • Safety cage used around ladders more than 6.5m in height.	____ ____ ____ ____	
8	Warning signs provided, or area roped off for scaffolding erected over possible work areas or walkways.		

HOISTING WITH MOBILE EQUIPMENT & CRITICAL LIFTS

PURPOSE:

To ensure safe and effective hoisting and lifting procedures for Chevron Construction projects.

APPLICATION:

Covers all hoisting and lifting with mobile equipment, including equipment requirements, responsibilities, planning requirements, critical lifts and personal hoisting.

PROCEDURES:

1.0 Requirements for Mobile Hoisting Equipment:

1.1 All mobile hoisting equipment shall be inspected to ensure it is in safe operating condition prior to use.

- for cranes and boomtrucks a preventive maintenance check shall be completed and documented daily by the equipment operator.
- for cranes and boom trucks a structural worthiness certificate approved by a Professional Engineer. The certificate shall be kept on file certifying the structural integrity of all significant load related components (i.e. boom sections, outriggers, frame, hooks, sheaves etc.). ***No inspection certificate shall be more than 12 months old.*** Any repairs or modifications must be done in accordance with the Occupational Health & Safety Regulations and Canadian Standard Z 150 Regulations.
- upon all lifting equipment entering on site, a Chevron Construction Rep. shall ensure a visual check is completed and a copy of the certification and operators lift ticket is copied for file.
- powered personnel hoisting devices shall be inspected and documented by a qualified mechanic at least annually.

1.2 Hydraulic boom cranes shall be equipped with an "Anti-two-blocking" device.

1.3 For cranes 15 ton capacity and over, and for boom trucks 5 tons and over, each operator shall be government certified for the equipment as a Mobile Crane & Hoisting Equipment Operator.

1.4 For equipment not requiring government certified operators, personnel shall be certified by the employer as having received adequate training for the equipment.

1.5 Hydraulic cranes must be parked such that no damage would occur if the boom is accidentally lowered.

1.6 Weather conditions must be favorable to perform any lifts. No lifts will be performed in extremly windy conditions. All crane activity will be suspended in the event that an electrical storm is in close proximity.

2.0 Responsibilities:

For each of the following work roles, the person must be adequately qualified, suitably trained and with sufficient experience to safely perform the job.

2.1 A competent worker shall be designated as the rigger, who must:

- be responsible for all the safe set up, condition and limitations of all rigging used for the lift. Suspect equipment should not be used and all defective slings must be destroyed immediately.
- be familiar with the type of lift.
- know the weight of the load to be lifted.

2.2 A competent worker shall be designated as the signal person, who must:

- guide the equipment in and out of congested areas and around any powerlines. The minimum clearance from any overhead powerline without utilities approval shall be 8 meters.
- act to safely direct the performance of the lift.
- be responsible for controlling the lift area.
- wear a traffic vest or arm band to identify yourself as the signal person.
- determine best communication method for the operation.

2.3 A competent worker shall be designated as the equipment operator, who must:

- be certified to operate the equipment.
- be familiar with the type of equipment.
- be familiar with the type of lift.
- ensure the equipment can safely lift the load.

3.0 Lifts

3.1 All lifts require a pre-lift communication with all involved parties, to review lift procedures and responsibilities.

3.2 The following planning information must be known for all lifts:

- total load weight below the hook.
- maximum boom length.
- lowest boom angle.
- maximum operating radius.
- allowable load at max. radius (after deduction of boom extension, load blocks, etc.)
- % (percentage) of allowable load.
- clearance between boom and surrounding facilities.
- maximum load rating of all slings.

This data shall be documented by the equipment operator and should be kept with the equipment's daily log. If numerous small lifts are required by the same crane, the planning can be done around the worst case scenario.

3.3 Load weights must be determined by one of the following methods:

- Certified scale weight (if available)
- A calibrated load weight indicator.
- Calculated weight (independently by more than one source).
- Published standard weight tables.

3.4 All loads must be free and clear to lift, avoiding any possibility of shock or impact loading of the hoisting equipment.

3.5 Tag lines shall be used to guide all loads, unless the tag line creates a hazard. A tag line must be of sufficient length to ensure the worker controlling the tag line cannot be struck by any movement of the load. If tag lines are not used, no personnel shall be in the area where the load could cause injury.

3.6 Signs and barricades should be erected to protect uninvolved personnel within the work area of the lifting equipment. If the lift is particularly complex or in a hazardous area, a site specific procedure must be used and a Foreman or his designate must be on-site.

3.7 Citical Lifts:

A lift which includes any of the following conditions shall be treated as a critical lift:

- load exceeds 80% of the maximum allowable load.
- load exceeds 50% of the maximum load and failure would endanger existing facilities.
- lift is within 8 meters of high voltage powerlines or conductors.
- lift has exposed or uninsulated high voltage lines within 360 degree swing arc of the boom.
- more than one boom is required to make the lift.
- lift will require the use of a manbasket.
- lift will require hydraulic crane using 2 lines reeved.

3.8 Engineered Lifts:

A lift which includes any of the following shall require an engineered lift. An engineered lift shall be planned, calculated, developed and have a stamp of approval by a designated Professional Engineer.

- Any lift over 50 tons in weight.
- Any lift which appears to be difficult to erect due to the size, shape or physical condition of the item that is to be lifted, no matter what the weight

of the item might be. ***The on-site Construction Manager shall be responsible to deem if the above shall be classified as an Engineered lift.***

3.9 A Safe Work Permit is required for all Critical Lifts. The Safe Work Permit Issuer shall ensure that the "Critical Lift Checklist" is completed and attached to the Safe Work Permit.

CRITICAL LIFT CHECKLIST

***** A SAFE WORK PERMIT IS REQUIRED FOR A CRITICAL LIFT *****

JOB DESCRIPTION:

_____

_____

_____

LOCATION: _____

SAFE WORK PERMIT NUMBER: _____

PERSON FILLING OUT CRITICAL LIFT CHECKLIST:
Name:_____ Company:_____
Date:_____ Time:_____

NOTE: All items on this checklist form an integral part of this standard. Each item may be acknowledged by circling *Yes*, *No* or *N/A* (Not Applicable). Items on the checklist with only a *Yes* answer opposite to them are mandatory.

A pre-job planning meeting is required to ensure complete job preparation:

			Name
Attendance:	Crane Operator	Yes	_____
	Rigger	Yes	_____
	Signal Person	Yes	_____
	Chevron Constr. Rep.	Yes	_____
	Contractor Foreman	Yes	_____
	Safe Work Permit Issuer	Yes	_____
	Other Workers involved in Lift	Yes	_____
			_____
			_____

GENERAL PLANNING INFORMATION:

Total load weight below hook	= _____
Maximum Boom length	= _____
Lowest Boom Angle	= _____
Maximum Operating Radius	= _____
Allowable load at Maximum Radius	= _____
% of Allowable load	= _____
Clearance for Boom	= _____

1. Safe plan/lift procedure reviewed by all involved parties? Yes

2. Safe Work Permit is attached to the lift checklist? Yes

3. Methods used to determine load weight? _____

4. Name of person responsible for load weight determination?
   Name: _____ Company: _____

5. Site/Unit safety standards and procedures specific to this job have been review? Yes N/A

6. All Workers clearly understand their roles and responsibilities? Yes

7. Weather conditions are favorable for this lift? Yes

8. Emergency Plan discussed for worst case scenario? Yes
   Plan Details: _____
   _____
   _____

9. A 2" test lift will be performed to ensure a safe lift can be completed? Yes

10. Is lift is within 8 meters of powerlines or conductors? Yes No
    (If yes to #10 complete this section, if no move to #11)
    - 10.1 Chevron Powerline Practice has been reviewed with workers Yes
    - 10.2 Power Utility company has been contacted to discuss lift? Yes
    - 10.3 Power Utility company has approved the lift? Yes
      Name of contact person: _____
      Date and time contacted: _____

11. Lift will require the use of a man basket? Yes No
    (If yes to #11 complete this section, if no move to #12)
    - 11.1 Alternate means of access have been considered? Yes
    - 11.2 Manbasket has been professionally inspected and proof of document is on file? Yes
    - 11.3 Manbasket was visually inspected before the lift? Yes
    - 11.4 Wind speed judged acceptable for this lift? Yes
    - 11.5 At least one attended tag line will be used? Yes
    - 11.6 Workers in basket will wear fall protection as per O.H&S? Yes
    - 11.7 Weather changes during lift have been considered? Yes
    - 11.8 Crane will <u>not</u> be used for any other purpose during the lift? Yes
    - 11.9 Crane will <u>not</u> travel with personnel in basket? Yes
    - 11.10 Operator will <u>not</u> leave controls with personnel elevated? Yes

11.11 Emergency Rescue Plan discussed and understood by all? Yes

11.12 Escape type breathing apparatus available in crane cab and manbasket if working in areas of potential H2S gas release? Yes N/A

11.13 Communication system for elevated personnel established? Yes

11.14 Only personnel and small tools will be carried in the manbasket? Yes

←

12. Lift requiring the use of 2 hydraulic cranes? Yes No

(If yes to # 12 complete this section, if no move on)

12.1 Anti-two-blocking devices are operational? Yes

12.2 Additional weight of hooks & rigging have been considered? Yes

12.3 A plan detailing the sequence of steps for the entire lift has been reviewed? Yes

12.4 Is the lift planned so that at no time either of the lines will have more than 80% of their load capacity? Yes

12.5 A competent person has been selected to coordinate the lift? Yes

Name: _____ Company: _____

↓

CHEVRON CANADA RESOURCES
- TRENCHING SAFETY PRACTICE

The contractor shall comply with the regulations set out in:

Occupational Health and Safety Act
General Safety Regulation
Part 10: "Excavation, Trenches, Tunnels and Underground Shafts"

Of particular note is the **1.5m threshold** for trench depths (i.e. if a worker enters a trench more than 1.5m deep, provisions regarding **cutting back of walls** and/or **temporary protective structures** apply)

Some key clauses from Part 10 are as follows:

169: Provides definitions of excavation, trench etc.

170: "This Part does not apply where a professional engineer has certified that the ground formation is and will remain throughout the use of the excavation, trench, tunnel or underground shaft stable, free from cave-ins and sliding or rolling materials and other hazards associated with the workings and which may compromise the safety of workers."

171: "A worker shall not enter an excavation, trench, tunnel or underground shaft that does not comply with this Part."

174(1): "Before a worker enters a trench more than 1.5 metres in depth, his employer shall ensure that the worker is protected from cave-ins or sliding materials by
(a) the cutting back of the walls of the trench to reduce the height of the remaining vertical walls, if any, to not more than 1.5 metres,
(b) the installation of temporary protective structures, or
(c) a combination of cutting back of the walls and the installation of temporary prottective structures."

July 23, 1996

Pile Driving with a Backhoe - Safe Work Practice & Procedure

Purpose:

In the course of field construction, where a small number of steel pipe piles need to be installed, a backhoe is often used for this task. This procedure is intended to provide a means of safely accomplishing this task; it is not intended to cover the installation of piles using recognized pile driving equipment.

Hazards:

There are three significant classes of hazards that may be encountered while pile driving with a backhoe: 1) personnel injury resulting from the loss of control of the pile; 2) hazards resulting from the pile contacting an underground structure while driving; 3) hazards resulting from equipment contacting an above ground structure (e.g.: an overhead powerline).

Regulatory Requirements:

The following Acts, Codes or Regulations include specific requirements relevant to the hazards that may be encountered during the performance of this task:

a) Province of Alberta ***"Occupational Health and Safety Act"***
b) Province of Alberta ***"Occupational Health and Safety Act - General Safety Regulations"***

Reference to Other Chevron Safe Work Practices and Procedures:

This practice is related to and should be carried out in conjunction with the following practices and procedures:

a) Field or Facility ***"Work Permitting Procedures"***.
b) Facility Engineering Services ***"Ground Disturbance & Pipeline Crossing Safe Work Practice"***.
c) Chevron ***"Powerline Safe Work Practice"***.

Responsibilities & Pre-job Planning:

The **Project Manager**, in conjunction with the **Construction Supervisor** and **Field Inspector**, shall undertake pre-job planning and preparation in accordance with the following:

1. ***"Ground Disturbance & Pipeline Crossing Safe Work Practice":*** outlines the steps that shall be taken to ensure that the work site is safe and no underground structures are present which may create a hazard during driving operations.
2. ***"Powerline Safe Work Practice":*** provides guidelines for working safely in the vicinity of powerlines.

Pile Driving with a Backhoe - Safe Work Practice & Procedure

Step by Step Procedure:

- A tailgate safety meeting will be held to discuss the driving operation; this procedure is to be reviewed and a worker "safe distance" will be established. The "safe distance" will be established by adding three metres to the length of the pile.

- Ensure that pile driving equipment is free of any defects, cracks, etc.

- Safety cables to be checked for wear.

- If the ground is such that it will be difficult for the pile to initially penetrate the ground then the following precautions will also be taken (e.g.: the ground is frozen or consists of pit-run gravel):

    - An anchor pipe is to be installed prior to the pile driving rig being attached to the hoe bucket. The anchor pipe is a section of pipe (about three feet in length) larger in diameter than the pile and into which the pile can be placed for control during driving.

    - As an alternate to the anchor pipe, a pilot hole may be dug through the difficult ground surface to eliminate the difficulty with initial pile driving.

- Attach the pile driving rig to the hoe bucket. When installing the pile driving rig, the safety cable is to be attached to the hook on the back of the bucket. The pile is then to be inserted into the pile driver. The safety cable is then to be attached to the pile. The cable is to be double wrapped to ensure that it does not slip. A chain **may not** be used in place of a cable as it may slide on the pile.

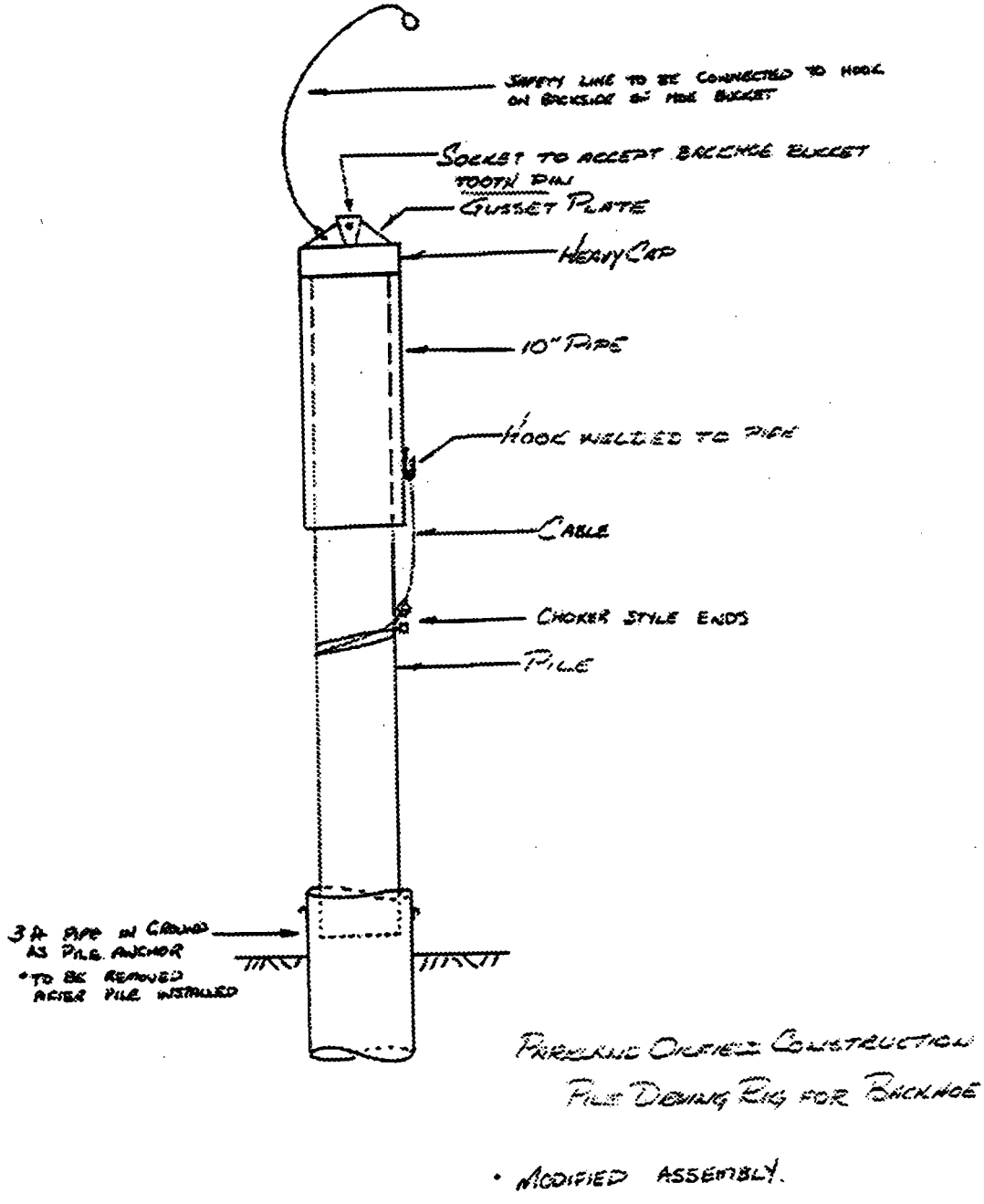
- Taglines are to be used while moving the pile into position.

- All personnel are to move to the "safe distance" once the pile has been positioned. The equipment operator shall not begin pile driving operations until all personnel are clear.

- Personnel are to remain at the "safe distance" until the operator signals that it is safe to enter the work area.

Pile Driving with a Backhoe - Safe Work Practice & Procedure

Diagram of Pile Driving Rig:



Hot Work - Safe Work Practice

Purpose:

Allow safe completion of all "hot work" on facilities construction projects.
"Hot Work" means any work that is capable of creating a spark or flame of sufficient temperature to ignite flammable or combustible material. Examples are: grinding, welding, cutting, sandblasting or the use of open flames, sparking electrical or pneumatic tools, motorized equipment or vacuum trucks in areas where flammable vapour or combustible materials may be present.

Hazards:

"Hot Work" is of concern when conducted in a location where a flammable substance is or may be in the atmosphere, or stored, handled, processed or used. In these locations, the "Hot Work" can lead to fire and explosion hazards.
Typical examples of hazardous locations in which hot work can lead to a fire or explosion are listed below (such hazardous locations plus a distance of 25 m shall be designated "hot work areas"):

- work in an operating facility
- work during turnaround in a facility
- work in and around equipment and piping that has previously been in service
- work in and around stored flammable products
- work in and around pipelines that are or have been previously been in service
- work within any utility right of way.

Regulatory Requirements:

The following Acts, Codes or Regulations include specific requirements relevant to the hazards that may be encountered during the performance of this task:

a) Province of Alberta *"Occupational Health and Safety Act"*
b) Province of Alberta *"Occupational Health and Safety Act - General Safety Regulations, Section 185"*

Reference to Other Chevron Safe Work Practices and Procedures:

This practice is related to and should be carried out in conjunction with the following practices and procedures:

a) Field or Facility *"Work Permitting Procedures"*.
b) Safe Construction Plan
c) Chevron's Fire Protection Manual

Hot Work - Safe Work Practice

Responsibilities & Pre-job Planning:

Designated "hot work areas" shall be defined as the areas within 25 m of any hazardous location.
All work done in designated "hot work areas" shall be done under a written work permit. In an existing operating facility, operations personnel shall be responsible for issuing permits. In a facility under construction Chevron Operations may delegate the writing of work permits to a designated Chevron representative. Where a safety inspector is present, the safety inspector shall issue permits; in the absence of a safety inspector, the Chevron construction inspector shall be responsible for hot work permits.

Fire retardant clothing, meeting Chevron standards, shall be required for all personnel working in designated "Hot Work Areas".

A Chevron representative must issue permits for all work in "hot work areas"; in addition, the Chevron representative or a responsible individual must be present for all hot work in "hot work areas". It is recommended that a safety inspector be retained for high risk and large projects. For lower risk / smaller projects and tasks, Chevron's Inspector or a responsible individual (eg Construction Superintendent or Forman) must be assigned this task.

Gas testing and monitoring is required prior to, and during, the performance of all hot work in "hot work areas".

When hot work is being conducted in "hot work areas", construction personnel in conjunction with the Chevron representative must develop procedures to ensure continuous safe performance of the hot work. The attached checklist outlines many of the questions that are pertinent to the development of these procedures. Each Field Area has a specific work permit form, which must also be reviewed for additional concerns.

If purging or blinding is being used to ensure that work can be conducted safely, then site specific written purging and blinding procedures must be developed. e.g.: blind procedures must identify all the connections to be blinded, who will do it, and must have a requirement for signoff from Chevron's representative to confirm that it was done.

All hot work in "hot work areas" shall be discussed at the morning tailgate meeting or at a tailgate meeting held before the work begins.

SAFETY CHECKLIST

Hot Work - Safe Work Practice

Construction activities that involve tie-ins to existing facilities or construction near operating or shut-in facilities is considered hot. The following identifies some of the issues to be considered and addressed prior to proceeding with any hot work.

1. Is there anything that can be done to the existing facility to minimize or eliminate the danger? ____
   eg Can high pressure lines be depressured?
   Can vessels be properly cleaned or purged?
   Is the area properly ventilated?
   Are electrical switches locked out?

2. Can the construction be done away from the hot work area? ____

3. Has the issue of Personnel Protective Equipment been addressed? Eye protection? Coveralls? ____

4. Is adequate protective equipment in place? H_2S, & Gas detection? Breathing equipment? Fire extinguishers? ____

5. Have all specific hazards been identified? (e.g.. Overhead power line, sour lines) ____

6. Is a safety man required? If the answer is no to this question, make sure that in the event that an accident did occur, you are still comfortable with the reasoning behind your decision. ____

7. A list of emergency phone numbers and key project personnel is required. Is it readily accessible in an emergency? ____

8. Are adjacent areas safe? Are workers in adjacent areas and affected plants aware that the work is going on? ____

9. Knowledge and communication are important in any hot work scenario. Ensure everyone knows what is happening on site. Are workers adequately trained? Are Safety Meeting planned to be a regular part of the work routine? ____

Calgary, Alberta
March 29, 1995
(last revised December 6, 1995)

PIPELINE CROSSING SAFETY

FACILITIES ENGINEERING

Summary

Chevron Canada Resources performs a large number of pipeline crossings each year. Pipeline crossings are high risk activities if not done safely. Pipeline hits can easily become pipeline ruptures with high potential for serious injury or death and significant property damage. A copy of a Chevron Canada Resources Pipeline Crossing Safety Guidelines by John Fulton April 1991 (revised by Ron Heuchert and Ken Roberts April 1995) is attached for reference. These guidelines will be incorporated into the Pipeline Construction General Conditions and Specifications.

Recommendations

1. Do your homework up front to locate all the lines possible along the route of the pipeline. Use all the resources available to you (specific resources are listed in the guidelines), but realize no one resource is 100% accurate.

2. Do not assume anything as it relates to locating lines.

3. Expose every line associated with the crossing by hand excavation or hydrowash.

4. Field Inspector should always be present during mechanical excavation.

RON HEUCHERT

RJH/sld
Attachment

Chevron Canada Resources

Pipeline Crossing & Ground Disturbance Safety Practice

J. D. Fulton

Design & Construction

April 1991

Revised by:

Ron Heuchert and Ken Roberts

April 1995

Converted to Ami Pro by:

Robert Neill

December 6, 1995

Table of Contents

1. **Introduction**

A. Nature of Problem

- CCR performs a large number of pipeline crossings each year
- Pipeline crossings are high risk activities if not done safely
- Pipeline hits are quite common with a high potential for serious injury or death if pipeline ruptures
- Hazards which may result include:
  - Exposure to flammable, combustible or explosive mixtures
  - Exposure to toxic mixtures or chemicals (such as hydrogen sulfide)
  - Contact with live electrical wires
  - Flying debris in the event of an explosion
  - Exposure to high pressure or high temperature fluids
  - Collapse of structures due to undermining of foundations

B. Chevron 1990 Statistics

- 165 km of pipeline installed
- 360 crossings of CCR and foreign pipelines
- 9 reported pipeline hits
- Of the 9 reported pipeline hits (or near misses) in 1990:
  - 2 had been hand exposed already
  - 2 had been staked out but not hand located
  - 1 assumed line location on AEUB map to be accurate
  - 1 had right-of-way shown on plan but pipe not staked or located
  - 1 assumed line to be deeper than it was
  - 1 line was exposed at two locations but not at the point of crossing; line did not follow a straight line between the two hand located positions
  - 1 assumed line to be abandoned

***** all 9 were preventable *****

C. Type of Buried Lines to Watch Out For

- oil, gas, and water
  - energy industry related
- electrical
  - high voltage and control cable
- public utilities
  - power, telecommunications, gas co-op lines

D. Regulatory Requirements

- The following Acts, Codes or Regulations include specific requirements regarding disturbance of the ground around existing buried structures:

  - Province of Alberta ***"Pipeline Act"***;
  - Province of Alberta ***"Pipeline Act - Pipeline Regulations"***;
  - Province of Alberta ***"Occupational Health and Safety Act"***;
  - Province of Alberta ***"Occupational Health and Safety Act - General Safety Regulations"***;
  - ***"CSA C22.1-94 Canadian Electrical Code, Part I"***; and
  - ***"CAN/CSA C22.2 No. 0-M91 General Requirements - Canadian Electrical Code, Part II"***.

- Note that a number of these Acts have provisions for fines and/or imprisonment for failure to follow their requirements.

- This work should be carried out in conjunction with the following practices and procedures:

  - Work Permitting Procedures;
  - Confined Space Entry and Respiratory Protection Code of Practice; and
  - Lockout Procedures.

2. **Summary Recommendations**

A. Do Your Homework

Do your homework up front in the office to locate all the lines possible along the route of the pipeline. A construction plan should be generated with the survey plan to provide more details about each particular line crossing. Use all the resources available to you but realize no one resource is 100% accurate. Resources available to locate lines are: AEUB (formerly the ERCB) base maps; Alberta 1st Call; Field Survey Drawings; Facility Plot Plans; Field Operations and Landowner Contacts; and Field Reconnaissance. More detail on these resources are available in the next section.

B. Assume Nothing

Do not assume anything as it relates to locating lines.

- **Do not assume** that the location or depth of a surveyed staked line is accurate unless you hand expose.
- **Do not assume** that a pipeline located at two points follows a straight line between the two points.
- **Do not assume** a pipeline locator will find all the lines along a pipeline route.
- **Do not assume** that operators will understand and/or obey your directions in your absence.
- **Do not assume** "abandoned" lines are abandoned.

C. Expose Every Line by Hand Excavation or Hydrowash

This point cannot be emphasized enough. It can be slow and tedious but it is always worth the time. Many surprises are discovered during exposing lines. Better to take the time to locate the pipeline now than spend the time later explaining why you hit it.

D. Field Inspector Always Present During Mechanical Excavation

If backhoe is there...you are there.

Consider the approach that if equipment is working near a pipeline, make it a priority for you or your inspector to be there. Pipeline crossings are critical operations and have a high risk potential if something goes wrong. If you cannot be at a crossing when equipment is there, then consider finding a way to get there; get more field inspectors or, as a last resort, shut down the digging operation until you can get there.

3. **Resources Available to Locate Lines**

A. AEUB (formerly the ERCB) Base Maps

- Are a record of all energy industry related pipelines (oil, gas and water) in **Alberta**. These are not available in other provinces.
- Phone AEUB at 403-297-8311 direct or call anyone doing Facilities/Pipeline work at Chevron for assistance.
- Base maps are generally quite good (>95% accurate) with respect to actual existence of pipelines in the area. Do not trust base maps for accuracy of actual location of lines or the order of placement of parallel lines. Base maps are also of little value in congested areas such as leases.

B. Alberta 1st Call

- Phone 1-800-242-3447.
- These services are useful in locating buried public utilities. Telephone, TV and power cables are usually buried in the ditches beside roads. Gas co-op lines which are not buried in road ditches and do not have a surveyed right-of-way (ROW).

C. Field Survey Drawings

- Survey drawings should pick all "surveyed" ROW's along the route of your pipeline. However, surveyors do not necessarily have access or can find all foreign ROW's survey plans. Also, survey plans will not tell you how many pipelines will be within a particular ROW. Finally, a surveyed ROW does not mean that the pipeline was installed entirely within the ROW.

D. Facility Plot Plans

- Lease sites are very congested areas and are the most difficult area to accurately locate buried lines and cables. Have the lease surveyed by competent surveyors experienced in locating lines. Review company drawings, including:
    - Plot plans
    - Buried piping plans
    - Foundation and/or piling plans
    - Underground electrical plans
    - Buried cathodic protection system drawings
- Try to reconcile the information on the plan with your new pipeline installation and current drawing.
- Be sure to account for every pipe riser on the lease.

E. Field Operations and Landowner Contacts

- Talk to Chevron and foreign pipeline operations staff regarding their knowledge of pipelines along the route of your pipeline. Also try to find out about possible abandoned lines, cable and/or non-metallic line locations.

F. Field Reconnaissance

- Drive around the area of your pipeline to validate your assumptions with respect to existence of pipelines. A field reconnaissance run should be undertaken to look for signs of previous ground disturbances. Indicators would include.

  - Buried pipeline marker signs (typically found at existing road, creek, or pipeline crossings)
  - Buried electrical or communication cable markers (also found at existing road or pipeline crossings)
  - Raised or sunken ditch lines on cleared land
  - Pipeline casings vents at road or railway crossings
  - Cathodic test posts
  - Cut lines through forested areas
  - Pipelines, cables, conduits, etc., which go from above to below ground at nearby facilities
  - Pipe rack columns, sleepers, etc., in contact with the soil
  - Cathodic protection rectifiers, thermo-electric generators, etc.
  - Vault manways, roofs, etc.

- Look for locations of existing wells and production facilities...can you account for the flowlines which will connect the well to the production facility. A single well may have more than one pipeline to it; for example, two flowlines if well is dually completed or a fuel gas line with a flowline.

In summary, the pre-construction checks are essential to ensure all buried lines in the path of your new pipeline are found. None of the individual checks by themselves are 100% accurate or foolproof. However, by checking all the sources and reconciling all the information, you will very rarely be surprised by an "unknown" buried line.

4. Construction Requirements

A. Crossing Agreements for Foreign Pipelines

- A legal crossing agreement must be obtained prior to any work being undertaken at a crossing site, including exposing by hand excavation or hydrowash. At least two weeks are required to obtain a crossing agreement. Land coordinates the acquisition of crossing agreements.
- Attached at the end is a line crossing inspection report to be filled out for crossings with foreign pipelines. Photo evidence of the crossing should be included with the report. It is recommended to use this form for crossing existing Chevron ROW's as a method to heighten safety awareness for a crossing.

B. Pre-construction Meeting with Contractor

- This type of meeting with the contractor, inspection and field operations is very useful in letting everyone know what is going on with respect to the crossing.
- Give the contractor all the information you have, so that he can be involved in decisions on how to go about the work safely.
- Have phone numbers available of emergency contacts in the event the pipeline or cable crossed is damaged during construction.

C. Expose Pipelines and Other Buried Lines by Hand Excavation or Hydrowash

- **This is the most important aspect of any pipeline crossing operation. It is imperative that this be done accurately and with care.**
- Exposure of pipelines is essential on all projects to positively identify and locate existing pipelines.
- AEUB regulations require that all buried pipelines within 5 metres of any excavation be first located by hand excavation or hydrowash (Clause 22.7). Once lines have been exposed, no mechanical excavation equipment is allowed to work within 0.6 meters of the exposed pipeline (Clause 22.10 in AEUB Pipeline Regulations) or 0.3 metres within of an energized cable or conduit.
- Hand excavation of lines means hand digging from surface, not using a hoe to dig off the surface and hand dig the rest. Hydrowash type pipeline locating equipment can also be a good choice for excavating and locating lines. Typically, these types of equipment are very effective in locating buried structures, especially where multiple targets or complex routing is anticipated (i.e., plant, battery & lease sites). Beware, picks swung by hand have enough energy to puncture an operating pipeline or electrical cable. Also, sharp probes used to locate lines have punctured plastic gas lines. Use of a hand probe with a rounded end to probe ahead of hand diggingis strongly recommended. This will help prevent damage to coatings and should result in locating structures faster.

- In winter, frost presents a problem for exposing pipelines. In hazardous locations: catadyne heaters are a slow but safe method for removing frost in hot work locations; a steamer truck or hydrowash with warm water can be used as a quick method of probing for a buried line and helping to get frost out of the ground. In non-hazardous locations: straw/coal fires can be very effective. **Do not** use any mechanical type equipment, even jackhammers or picks, as they do not discriminate between frozen ground and steel pipelines.
- Exposing pipelines should be considered a Level 3 operation requiring the use of fire-retardant coveralls.
- Use of electromagnetic pipeline locating equipment can be helpful but should not be relied upon to provide accurate line locations. A number of factors influence their reliability, particularly the experience level of the operator, whether it is used in conductive versus inductive mode and lastly, the number and type of buried metallic structures in the area. Other techniques such as "witching", "dowsing", etc. do not have a scientific basis and should not be relied upon (having said this, if "witching" finds a line, check it out). Surveyors and firms which specialize in line locating typically obtain the best results. Note that it is very difficult to find lines you are not aware of with a line locator. Do not trust the staked location or depth of a located pipeline without confirming it by exposing.
- Buried power lines on locations will typically have a concrete or plank cover above the lines, with a yellow warning tape above that. Chevron occasionally uses a red dye in the concrete to identify such protective covers. Non-metallic lines are typically run with a tracer wire immediately adjacent to or above the pipelines. This wire can be sued to locate the line when used in conjunction with an electromagnetic pipeline locator.
- To ensure that new structures are not damages by future installations, signs should be installed which indicate their positions as closely as possible.

D. <u>Mechanical Excavation and Backfill</u>

- Once all lines have been located, mechanical excavation can commence. Remember the AEUB regulations do not allow mechanical excavation within 5.0 meters of line prior to exposing and also do not allow mechanical equipment within 0.6 meters of an exposed line.
- Make sure that you (or your inspector) and the contractor's foreman are present **at all times** during all excavation work at a pipeline crossing location. Many lines have been hit as a result of inadequate supervision. Never let a backhoe operator work alone.
- Pipelines and electrical or communication cables and conduits should be shutdown and depressured or de-energized whenever reasonably possible.
- Note that some buried structures can be damages simply by heavy equipment operating above them. Each structure should be reviewed to ensure that it will not be damaged by such activity or alternately, cover should be built up over the structure in the form of a ramp.

- A safety watch shall be assigned to attend the excavation or pile driving at all times that the heavy equipment is in operation. The primary duty of this safety watch is to ensure that the equipment does not approach the buried structure too closely or otherwise cause damage. They have a distinct advantage over the equipment operator in that they have a closer, more unobstructed view of the work in the excavation. They should also be able to stop the equipment operator form continuing work through the use of hand signals or a significant audible alarm. If hand signals alone are to be used, they must maintain a clear, unobstructed sight path with the machine operator.
- Should a previously unidentified structure be located while using heavy equipment, stop all operations at once. Do not proceed until the structure is identified as to its purpose, route, contents or voltage and other pertinent data have been determined.

E. Protective and Other Required Equipment

- Personnel involved in locating and/or excavating around the buried structures should have on their person, or have immediate access to, the following:
    - Hard hat, appropriate work gloves and safety footwear
    - Fire retardant clothing
    - A portable fire extinguisher
- Either a full face shield or safety goggles may be required if locating activities result in flying debris such as sand, gravel, steam ore high pressure water. Safety belts, harnesses and/or shoring may be required if hand excavation requires personnel to be working in a bellhole or trench of sufficient depth. The current *"Occupational Health and Safety Regulation"* requirements should be consulted.

5. **Roles and Duties**

A. Project Manager

- Field reconnaissance, includes liaison with Operations, of area when selecting route.
- Review surveyor's drawings with regard to the resources of information (listed earlier in these guidelines).
- Initiate foreign crossing agreements, through Land.
- Consult the Pipeline Act and Regulations, and applicable CSA standards, for interpretation of the law to forward to Contractor and Field Inspector.
- Pre-construction meeting with Contractor to discuss specific pipeline crossings.
- Pre-construction discussion with Operations to determine lead time for Operations inspection.
- Ensure that a legal crossing agreement is in place before permitting construction to proceed.

B. Field Inspector

- Field reconnaissance, includes liaison with Operations, of area around pipeline route.
- Ensure that a legal crossing is in place before permitting construction to proceed.
- Talk to foreign pipeline operations staff regarding their knowledge.
- Organize "tailgate"safety meeting prior to beginning any locating or excavation at a specific location with all personnel involved.
- Arrange for foreign pipeline representative to witness crossing.
- Be there for excavation.
- Organize Operations to inspect site after exposing line and prior to excavation.
- Ensure that there is adequate cover over the ROW before allowing heavy equipment to cross over vulnerable pipes.
- Inspect the full diameter of the pipe for damage before allowing backfill (with the Inspector present).
- Enforce clearance requirements between existing pipeline and new pipe.
- Fill out line crossing inspection form with photo evidence.
- Supervise the installation of test leads as per approved procedures.
- Maintain constant communication links to Operations personnel, in the event that something unforeseen happens, Operations personnel should be able to react quickly to minimize any impacts.

C. Surveyors

- Review all resources for information.
- Generate crossing plans.
- Locate and flag pipelines at crossings.
- Show all lines in a construction plan.

D. Operations

- Make time for Project Manager/Field Inspector/Surveyor for pre-construction discussions and crossing site inspections.

E. Contractor

- Ensure their foreman is on site when work is being performed.
- Locate and expose pipeline (and other buried lines) by hand excavation or hydrowash.

6. APPENDIX

GENERAL GROUND DISTURBANCE PRACTICE FOR BURIED STRUCTURES THAT FORM THE SURFACE OF THE GROUND

Definition

A buried structure that forms the surface of the ground included, but is not limited to, the following:

- Wellbores
- Concrete Foundations
- Individual Pilings or Pile Foundations
- Roads
- Railways
- Irrigation Canals

Slope Stability

Where excavation could undermine an existing structure, such as a foundation, a pipe rack, a roadway, a railway bed, a canal, etc., have slope stability reviewed by a professional engineer. Temporary or permanent shoring, bracing or stepped excavation may be required to prevent sloughing in of the soil while workers are in the excavation or to prevent collapse of a surface structure which relies on the soil for its foundation. A typical rule of thumb for sandy or gravelly soils is to ensure that a foundation will not be undermined is to be a lest twice as far horizontally form the structure as the depth of the excavation. No easy rules of thumb are available for soils with high clay or silt content.