



RISK MITIGATION

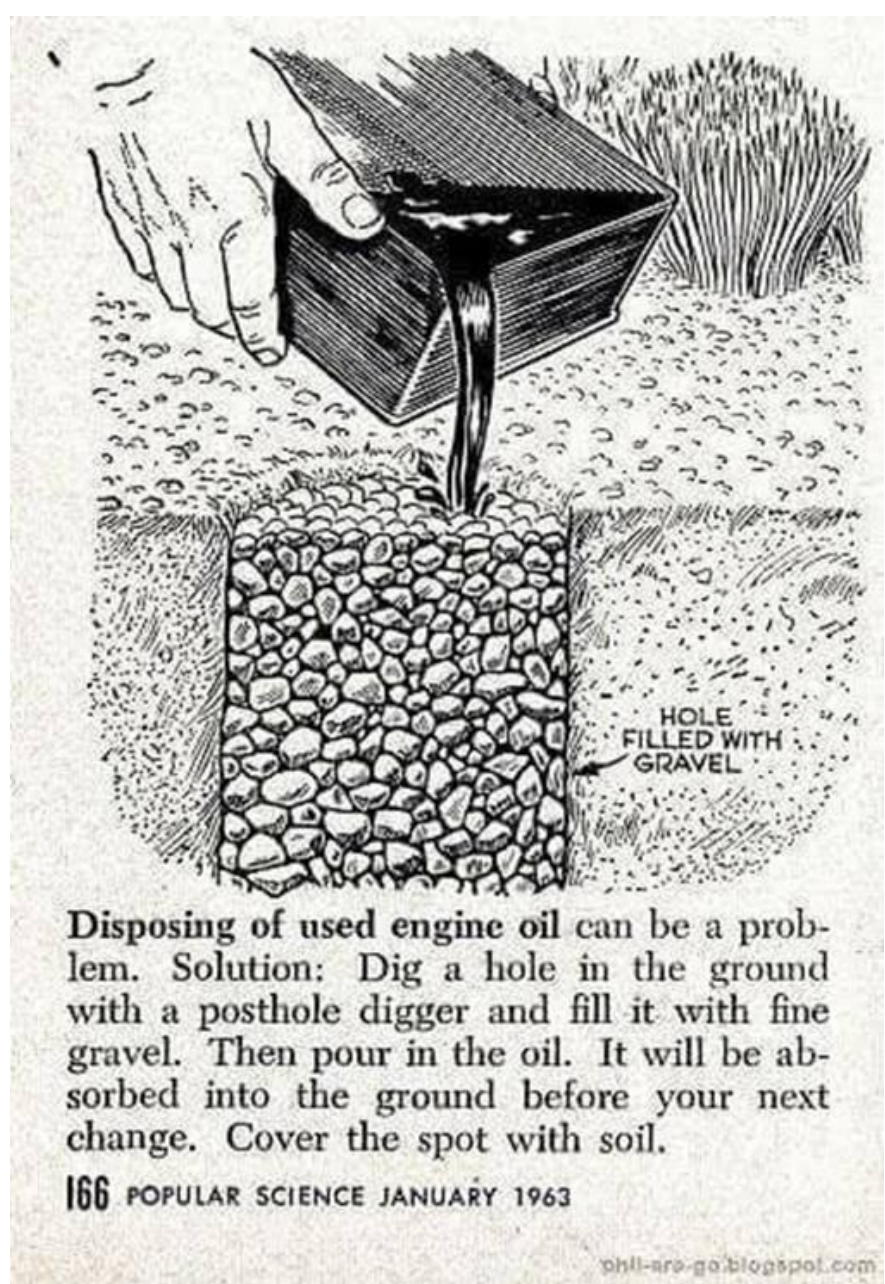
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Topics of Discussion

- Refinery Overview
- Risk Mitigation - Regulatory
- Risk Mitigation – Process Safety
- Risk Mitigation - Assessment
- Risk Mitigation – Emergency Response Plan
- Questions



This is an article
from Popular Science
dated January 1963.



Refinery – North Vancouver

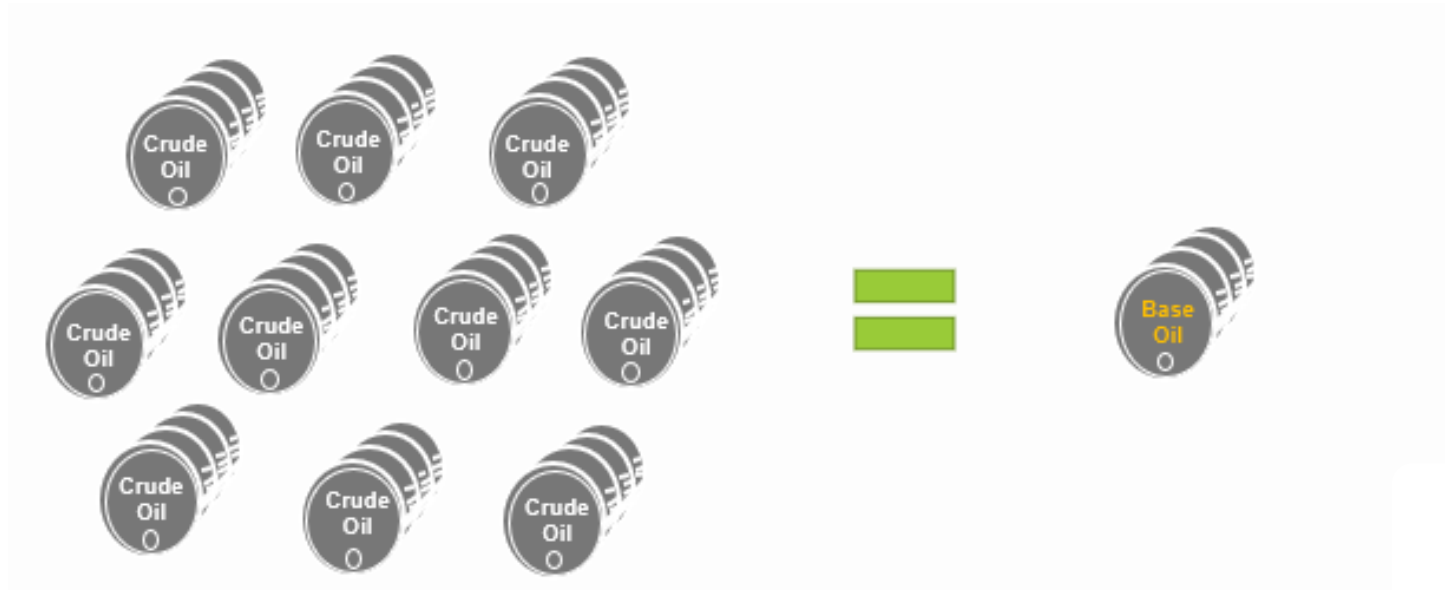
North Vancouver

This facility was the world's first commercial scale re-refinery to use vacuum distillation and hydrotreating to recover base oil from used lubricating oil

- Located in North Vancouver, BC
- Employs 42 trained staff
- Processes 42 ML of UMO annually
- Produces co-products including Fuels, VGO and Asphalt Extender
- Produces 28ML base oils, 100N, 150N, 450N
- Produces Fully Formulated Lubricants



How Much Crude Oil To Make BASE OIL?



How Much USED OIL To Make BASE OIL?



We Make Base Oil

- 100N
- 150N
- 450N
 - The numbers = viscosity
 - “N” = neutral (not acidic or base)



- Our highest volume product = 150N

From BASE OIL to LUBRICANT

Lubricants are blended from base oils and additives.

- Refineries make base oil then LUBRICANTS are blended.
- Lubricants are blended from refined and synthesized products.
 - Base Oil(s)
 - Additives
 - VM (viscosity modifiers)

Risk Mitigation - Regulatory

- Facility operates under an Operational Plan administered by BC Ministry of Environment and Climate Change Strategy (RS-08511). Regulated limits to amount and types of Hazardous Waste that can be stored and processed on-site.
- Effluent Emissions (storm water) must be treatment to below permitted levels for pH, Oil & Grease, Heavy Metals, Phenols and Sulfides.
- Air Emissions must be below permitted levels set by Metro Vancouver permit GVA 0254 with limits on flow rate, HCl, NO₂, SO₂, TRS, VOC, particulate and opacity.
- Also regulated by Technical Safety BC (boiler and pressure vessels), Transport Canada (trucking and rail activity), Worksafe BC and CNSC (Canadian Nuclear Safety Commission)

Risk Mitigation – Process Safety

- Process Safety Management is comprised of policies, procedures and best practices designed to prevent incidents
- GFL is committed to ensuring a safe workplace per our operational policies
- Hazards are identified and mitigated using these processes:
 - ❑ HAZOP – Used during design phase of new projects and periodic review of existing operations. Ensures all projects and processes are build to industry standard and all regulatory codes met. All possible risks and hazards are identified and mitigation strategies are put in place.
 - ❑ Work Permits – ensure all safety concerns addressed before starting a job including lockout/tagout and isolation records.

Risk Mitigation – Process Safety

- Hazards are further identified and mitigated using these processes:
 - ☐ FLRA – Field Level Risk Assessment (daily check on risks of jobs)
 - ☐ JHA – Job Hazard Analysis (non-routine tasks)
 - ☐ SOP – Standard Operating Procedures (routine tasks)
 - ☐ JTO – Job Task Observation (prove worker competency)
 - ☐ SEMS - Incident reporting / investigation of all incidents regardless of severity

Risk Mitigation: Assessment

➤ Risk Assessment activities include:

- 3rd Party chemical and noise exposure monitoring to ensure compliance with occupational exposure limits
- Maintain and use Exposure Control Plans for hazardous substances including solvents, oil mist, hydrogen sulfide and used oil
- 3rd party Property Risk Evaluation – provides broader view of risks and identifies areas for improvement
- 3rd party Risk Assessment for potential expansion – determine if expanded production results in greater risk for workers and the community

Risk Mitigation - ERP

- GFL maintains an approved Emergency Response Plan (ERP) which outlines the response and reporting procedures to be used in the event of an unplanned incident.
- In the event of an emergency the goals of the ERP are:
 - Ensure immediate and ongoing care of all employees, contractors, and visitors
 - Protect the immediate community surrounding the plant
 - Protection of the environment
 - Protection of equipment and structures

Risk Mitigation - ERP

- To achieve the goals of the ERP, GFL is committed to:
- Provide proactive measures to protect the site
 - Ensuring clear roles and responsibilities for all personnel
 - Provide and evaluate training for all personnel related to their role and responsibilities
 - Ensuring clear communication and to all parties during an incident
 - Providing all reasonable material necessary to achieve the ERP goals
 - Ensure all ERP equipment is maintained in a state of constant readiness

Risk Mitigation - ERP

➤ Key components of the ERP include:

- Identification of facility hazards
- An emergency response organization chart
- Resource requirements including – first aid kits, eye wash stations, safety showers, fire extinguishers, spill kits and fire alarms
- Training requirements including – evacuation drills, emergency system testing and fire training
- Response procedures for – medical emergencies, fires, environmental releases, accidents, explosions, weather emergencies, 3rd party threats, shutdowns and evacuations
- Recovery operations – incident investigation, damage assessment, site restoration and external support

Risk Mitigation

➤ Compliance Verification:

- Daily, weekly, monthly inspections by GFL employees
- Client Audits – typically for Customers
- Regulator Inspections - Transport Canada, BC MOE, Metro Vancouver
- 3rd party audits to ensure compliance with regulations:
 - Biennial Environmental audit for compliance with the BC HWR
 - Yearly Energy Safety Canada COR Audits

Interesting Facts



Our Western facility assists with displacing approximately 138,970 tonnes of greenhouse gas emissions. To put it in perspective, this is equivalent to:

- Annual emissions from 26,572 passenger vehicles, or
- 15,632,171 gallons of gasoline consumed, or
- 323,186 barrels of oil consumed, or
- Recycling 42,448 tonnes of waste instead of sending it to a landfill.



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