



# Workers Compensation Claim Template for a Leaded Petrol Era Oil Refinery Worker

Eg Brian Arndt who worked at New Zealand Refining Company 1965-1975

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In your claim, list your exact work start and end dates, any personal protective equipment you wore, any engineering controls (or lack thereof), safety training (or lack thereof) or biological monitoring results (or lack thereof) and all your health issues and when they first arose, and state that you were exposed at the refinery to various MIXTURES of carcinogens and other hazardous chemicals during various activities / stages of the refinery work cycle, and that the INTERACTIONS (also known as “Synergistic effects”) between the carcinogens, mutagens and other hazardous chemicals in these hazardous mixtures was the cause of your cancers and other health issues. Many hazardous chemicals have not been studied sufficiently even in isolation, let alone when mixed together as occurs at an oil refinery all the time (not just during turnarounds). But hazardous chemicals can interact with one another, in ways that have barely been studied at all, to cause damage to workers (who thus become the “experimental animals”) who are not properly protected.

Quote (in your claim) the following Answer from Elizabeth O'Brien's article 22 “Lead scavengers & other carcinogens in gasoline, New Zealand 1965-1975” in LEAD Action News vol 20 no 1 (now online at <https://lead.org.au/lanv20n1/LANv20n1-22> and <http://www.leadsafeworld.com/LANv20n1-22/>; and accessible via <https://lead.org.au/nl.html> and <http://www.leadsafeworld.com/media-page/> ):

A: In L S Gold, G M Backman, N K Hooper, and R Peto, *Ranking the potential carcinogenic hazards to workers from exposures to chemicals that are tumorigenic in rodents*, Environ Health Perspect. 1987 Dec, two lead scavengers (out of 41 chemicals which cause tumours in rats) were ranked first (ethylene dibromide) and second (ethylene dichloride) for potential carcinogenic hazards to workers (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1474483/?page=1> ), and the discussion (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1474483/?page=8>) points out that we have little knowledge of the **potential interactions of individual agents in chemical mixtures** [like the lead additive for fuel which contains both lead scavengers and tetra-alkyl lead, or like leaded petrol, which contains the lead additive mixture plus benzene, ranked 10<sup>th</sup> of the 41 chemicals] and with other carcinogenic exposures such as smoking:

For 41 chemicals there exist both reasonable data on carcinogenic potency in experimental animals and also a defined Permissible Exposure Level (PEL), which is the upper limit of legally permissible chronic occupational exposure for U.S. workers. These 41 agents are ranked by an index that compares the permitted chronic human exposure to the chronic dose rate that induces tumors in 50% of laboratory animals. This index, the Permitted Exposure/Rodent Potency index, or PERP, does not estimate absolute risks directly, but rather suggests the relative hazards that such substances may pose... Ranked by PERP,



these chemicals are: ethylene dibromide, ethylene dichloride, 1,3-butadiene, tetrachloroethylene, propylene oxide, chloroform, formaldehyde, methylene chloride, dioxane, and benzene. [end of Answer]

Make the claim (which is entirely supported by the two later Q&As pasted in below, from Article 22), that you were exposed to MIXTURES of hazardous chemicals (including carcinogens) which caused an array of health impacts (including cancers):

**Q: when Brian Arndt was working during refinery shutdowns (turnarounds), what hazardous chemicals (including carcinogens) was he likely exposed to?**

A: Appendix 5: Examples of Hazardous Agents...from *Management of Occupational Health Risks during Refinery Turnarounds*, by M. Molyneux, D. Bonte, P. De Wilde, J. Ilinyi, T. Kaitale, A. Tiltnes, B. Simpson, J. Urbanus (Technical Co-ordinator), CONCAWE (established 1963), Brussels 2000, <https://www.concawe.eu/wp-content/uploads/2017/01/2002-00233-01-e.pdf> - lists the following hazardous agents which require management during refinery shut-downs:

**CRUDE OIL**

- Hydrogen sulphide
- Sulphur dioxide

**PETROLEUM GASES**

- Propane
- 1.3-Butadiene

**NAPHTHA / GASOLINE /**

**CONDENSATE**

- Hydrocarbons C4-C11
- Benzene
- n-Hexane

**KEROSENE / MID DISTILLATES**

- Hydrocarbons C9-C25
- Gasoils (cracked and unspecified)

**HEAVY BOTTOMS**

- Heavy fuel
- Bitumen
- PAH / Coke

**LUBRICANTS**

- Unrefined oils
- Unrefined greases

**EXTRACTION SOLVENTS**

- Furfural
- Toluene
- Ketones, e.g. MEK
- Chlorinated solvents
- Phenol

**SULPHUR**

**ADDITIVES**



#### PROCESS

- Amines / Ammonia
- Phosphates / H<sub>2</sub>PO<sub>5</sub>
- Caustic / KOH
- Chlorides / HCl
- Sulphuric acid

#### BOILER WATER

- Hydrazine

#### FUEL

- Oxygenates
- TEL / TML
- OctylNitrate
- Mercaptans

#### **SURFACE STRIPPING / COATING**

##### ABRASIVE BLASTING

- Dust
- Lead

##### HYDROBLASTING

- Polluted water / aerosol

##### APPLICATION OF PROTECTIVE COATINGS

- Two part (reactive) coating
- Solvent based coating

##### CHEMICAL CLEANING

- Corrosives
- Solvents

#### **WELDING & CUTTING**

##### FUMES

- Lead
- Metal oxides (Galvanized steel)
- Stainless steel (Ni, Cu)
- Carbon steel
- Surface coatings

##### GASES

- Ozone
- NO<sub>x</sub>
- Carbon monoxide

#### **INSULATION REMOVAL / INSTALLATION**

##### MMMF

- Glasswool

##### REFRACTORY CERAMIC FIBRES

##### ASBESTOS

##### POLYURETHANE

- Isocyanates

#### **CATALYST REMOVAL / LOADING / REGENERATION**

##### ACTIVATED ALUMINA



#### HEAVY METALS

- Molybdenum
- Cobalt
- Platinum
- Vanadium
- Antimony
- Nickel

#### ORGANIC SULPHIDES

- Dimethyl disulphide
- Dimethyl sulphide

#### CHLORINE

#### CHLORINATED HYDROCARBONS

- Perchloroethylene

#### HYDROGEN FLUORIDE

#### SULPHURIC ACID

#### **UTILITIES**

#### NITROGEN

#### HEAT TRANSFER OILS

#### HYDRAZINE

#### POLYAMINES Eye

#### PCBs

### **Q: which other carcinogens and mutagens does Shell list as chemical hazards for refinery workers?**

A: Table 7a (i) Refinery: Chemical Agent Inventory: Examples of chemical agents and the principal areas in which they may occur, from “Shell Occupational Health Hazard Inventory”, web-published by Petroleum Development Oman on 6th May 2012, available as link at:

[https://www.pdo.co.om/hseforcontractors/Health/Documents/Forms/AllItems.aspx?Page=TRUE&p\\_SortBehavior=0&p\\_FileLeafRef=PDO%20HEALTH%20HAZARD%20REGISTER%20122016%2exlsx&p\\_ID=370&RootFolder=%2fhseforcontractors%2fHealth%2fDocuments%2fHRAs&PageFirstRow=31&&View={CA6B6393-9515-41E4-8223-61BADE2DAB33}](https://www.pdo.co.om/hseforcontractors/Health/Documents/Forms/AllItems.aspx?Page=TRUE&p_SortBehavior=0&p_FileLeafRef=PDO%20HEALTH%20HAZARD%20REGISTER%20122016%2exlsx&p_ID=370&RootFolder=%2fhseforcontractors%2fHealth%2fDocuments%2fHRAs&PageFirstRow=31&&View={CA6B6393-9515-41E4-8223-61BADE2DAB33}) includes among refinery carcinogens and mutagens:

Products: Gasolines (contain benzene); Streams containing PCAHs (Polycyclic Aromatic Hydrocarbons) - Gas oils, Heavy fuel oils, Cycle oils, Crude oil; 1-3 Butadiene (may contaminate LPG streams)

Internal streams: Low boiling naphthas (benzene); Streams containing PCAHs including Base oils, Gasoil, Heavy fuel oil, Long/short residues, Waxy distillate

Raw materials: Crude oil (PCAHs and benzene); Low boiling naphthas (Benzene); Benzene heart cut; Long residues (PCAHs); Waxy distillate (PCAHs); Furfural extract (concentrated PCAHs); Gas oils (PCAHs); Light cycle oils (PCAHs)

Auxilliary chemicals: Hydrazine salts; crystalline silica (calcined diatomaceous earths, filter aids); Fuel oils (PCAHs furnace heating)



By-product/Wastes: Furfural extract (concentrated PCAHs); Slops containing PCAHs; Coke (PCAHs); Sludges from black oil tank bottoms (PCAHs); Furnace residues (nickel compounds); Some used transformer oils (PCBs)

Maintenance, construction and cleaning: Asbestos (gaskets, insulation, partitions); Some man-made vitreous fibres (furnace linings, insulation); Chromates (some paints); Chromium (VI) stainless steel welding fume (e.g. furnace tubes); Nickel in anti-seize compounds; Used engine oil (PCAHs). [end of Answer]

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