



## JOB DEMANDS ANALYSIS

**Company:** GVRD

**Location:** Watershed

**Job Title:** Chlorine Truck Driver

**Classification:** Regular Duty

### Purpose of Activities

The purpose of the Chlorine Truck Driver position is to ferry tonners of chlorine from one watershed operation to another and to/from the supplier of chlorine.

### Tools and Equipment

The following tools and equipment are used to perform their duties:

- GMC/White cabover Flatbed truck, standard transmission.
- Budgit Crane/Hoist.
- Caldwell Hoist.
- Tonners of Chlorine (2.2 m long and 0.83 m in diameter, 1500 kg full and 590 kg empty).
- Locking blocks with cotter pins on truck bed.
- Safety (portable gas detector, B-kit, Tyvek suit, Scott Pak).

### Usual Methods – Load Tonners

1. Get out of cab.
2. Place four (4) dangerous goods stickers in holders on outside of truck.
3. Climb onto truck bed (1.40 m).
4. Guide forklift driver.
5. Push/roll tonner into position.
6. Flip up blocks and slide two pins into place.
7. Repeat for four tonners.
8. Twist bolts to lock blocks in place.
9. Climb down off of the truck bed.
10. Climb back into truck (1.20 m).

### Usual Methods – Crane Operation (Budgit)

1. Pull crane along beam to tonner.
2. Push button to lower crane.
3. Push button to hook bar and then raise tonner.
4. Push tonner (30 kg) down to loading position.
5. Lower tonner to truck or concrete position.



The Caldwell crane is fully automated so it is not necessary to push the tonners. However, the short control wire means that the operator has to follow the crane, stepping over tonners as they go. There is at least one individual available to assist the driver at each stop.

### Administrative Issues

The early part of the shift is normally used for phone calls, warming up the truck and checking the brakes. This vehicle does not necessarily operate everyday depending on demand for chlorine.

The driver may visit all three watersheds as well as the StanChem plant and may also visit Lion's Gate and Lulu Island sewage treatment plants.

### Activity Demand Variables

These variables are tasks that must be carried out by the employee and are implicitly or explicitly required as objectives of the job.

- Seated position.
- Operate cranes.
- Climb on and off truck bed and in/out of cab.
- Driving while seated in traffic.
- Work outside.
- Route determination.

### Worker Decision Variables

These variables are the sub-routines and cognitive/physical decisions made by the worker in carrying out the objectives of the job.

- Some control over pacing.
- Timing of breaks.
- Some control of loading methods

### **Accommodative Considerations**

1. People with injuries to the spine in any region may have difficulty with the static and largely seated postures. They may also have difficulty with getting in and out of the vehicle several times.
2. Individuals with knee or ankle/foot problems would be very challenged by the agility requirements and regular climbing up and down required.
3. People with shoulder injuries such as rotator cuff tendinitis, bursitis and instability may have difficulty with the steady shifting of gears on the right side.
4. People with any upper extremity problems may have difficulty with this position (especially grip related issues like carpal tunnel syndrome and epicondylitis).
5. post-whiplash or individuals with neck problems may find that the vibration involuntarily increases muscle tension to reduce shear (it is likely that the driver will adapt to this requirement within a few weeks).



6. The sitting required for this position would aggravate individuals with hemorrhoids or suffering from vascular insufficiency in the legs
7. There is a learning curve associated with this work.

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## Summary of Stresses

### **Metabolic Stresses**

The aerobic energy system supplies the vast majority of energy required to complete the tasks in this position since the work can be characterized as being light activity, mostly seated with only occasional light exertion.

### **Structural Stresses**

**Spine** – the sedentary nature of this work can place significant passive loads on the spinal structures. Prolonged sitting increases disc compression forces alone. If great care is not taken to control posture, it is not unusual to have people adopt a flexed spine posture that requires no activity from the torso musculature, but increases asymmetrical disc compression, passive stretch on the posterior ligaments and disc fibres. This can contribute to disc integrity problems over time as well as contributing to deconditioning of the torso support musculature. This issue is complicated by the tendency of the driver's seat to tip back and by the significant (4 cm) anterior-posterior shear vibration that is present in the vehicle.

**Shoulders and Neck** – the right arm must reach into an extended position to operate the gearshift with some force required. This is a weak biomechanical position for the shoulder and arm to operate.

**Arms and Hands** – grip is a key issue in having to manipulate pins and bolts as well as handling a steering wheel on a big truck in traffic.

### **Special Stresses**

This truck is carrying lethal cargo and some individuals may be intimidated by that prospect.

### **INTERVENTIONS**

Recommendations that could be implemented to increase productivity and lessen the risk of injury are listed below:

1. Purchase a new truck that has significantly reduced vibration and more steady seat.
2. Lengthen the control wire on the Caldwell Hoist so that the operator does not have to follow the tonner's path when moving these objects around.
3. Provide regular education in effective use of the body and neutral joint positions for this type of work.
4. Encourage regular conditioning of the body to counter the effects of spending so much time in a sedentary job.



