## SERSTECH

Chemical intelligence solutions

#### Case Study 3 – Hazmat Fire Department Hazardous Materials Technician

### The general situation

**Character:** John B works for the a Fire and Rescue Service, they have two hazardous materials teams. John is one of the full-time cadre and is the team's leading detection, identification, and monitoring (DIM) specialist.

**Area:** There is also a diverse variety of light, medium, and heavy industry. A thriving agricultural sector brings traffic in agricultural chemicals (e.g. pesticides, herbicides, fertilisers) and hazardous materials that support the food processing industry (refrigerants, fumigants).

A small fire in a fruit warehouse could easily involve large amounts of refrigerants, pesticides and fertilisers if it grows.







### Incident 1 – The Barrels

John is duty leader of the four person Hazmat Team on Tuesday afternoon. The team receives an alert.

- Traffic accident on a secondary road in a rural area.
- John and his team respond in the hazmat truck to the site of the accident.
- A truck carrying a large number of barrels has overturned and several are barrels are leaking.
- Firefighters wearing their normal firefighting gear and breathing apparatus made an emergency entry into the area and rescued the driver.
- The firefighters and paramedics have retreated.







# John and his colleagues arrive on the scene

There are things like carbamate and organophosphate pesticides that are highly toxic, fertilizers that are highly reactive to water, or solvents that are highly flammable. Worse, this accident could be a cocktail of all of the above.

- Conduct an initial reconnaissance, using a spotting telescope.
- Check the registration of the truck and contact the company to gather more information.
- The hazard placard is simply one saying "Dangerous" which is standard practice for mixed cargo of multiple small shipments.
- There should be shipping papers and markings on the individual barrels, but there is no way to see that from hundreds of meters away.
- The importance of having proper documentation and markings for hazmat shipments.







### What is actually happening?

- The team members put on their breathing apparatus and gastight suits
- Anything the team carries must be light and easy to use.
- Bring with them:
  - Gas monitor with a combustible gas indicator and a photoionisation detector
  - Digital camera in a plastic bag.
  - Serstech 100 Indicator, which is small and light.
- Photograph the barrels and the labels.
- Gas sensor indicates the presence of moderate levels of combustible gas or vapour in the general area.
- Obtain PID readings of several hundred parts per million of volatile organic chemicals.
- Use the Serstech 100 Indicator on the three different liquids. It only takes a few seconds to collect each spectra.









### **Collected data on ChemDash**

- The team sends the spectra they have collected into the ChemDash software.
- John pulls up the files on his laptop almost instantly. He identifies the following chemicals:



Digital camera images of the leaking barrels.





### Conclusion

- Based on the Serstech Identifier, John is able to conclude that the other two products are an engine degreaser, and a fungicide.
- The combustible gas indicator and PID readings are consistent with the presence of xylene and methanol.
- None of these chemicals is going to present a serious hazard, nor require a serious isolation or protective action area.
- They can now formulate a plan to safely handle the products and contain the hazard until the company can pay for a detailed cleanup.



