

## Chemicals - 'the soup of life' and what this means to you and your business

This is the first in a series of quick tips to help you manage the chemicals in your business in a smarter way.

Chemicals in many ways have a bad wrap (mind the pun). When we hear the word "chemicals", there is typically a pause in the conversation and a sense of caution emerges. Actually, this is probably a good thing. Most of us aren't very *chemically* smart. We've forgotten our high school science, which is where we learned that chemicals are part of the basic recipe of everyday life. We are all chemical beings, largely composed of H<sub>2</sub>O - *ah, that would be water*. Look in the mirror and you will see a mobile chemical plant. We breathe in air that contains oxygen (a gaseous element). It moves through an intricate exchange from the lungs to the heart and voilà, returns to the air as carbon dioxide, a by-product of our respiratory system.

Absolutely everything you come into contact with on a daily basis has chemicals in it. *So when you see an ad saying a product is 'chemical free' - someone obviously failed high school chemistry. We all should have paid more attention to our high school chemistry teachers. Nothing is chemical-free.*

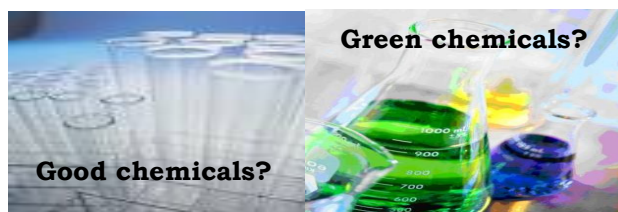
To help, here is your 5-point refresher course.

1. The stuff of everyday life is made from matter, which is composed of tiny, indivisible particles called atoms. (These are the smallest unit possible, chemically speaking.)
2. Atoms of a given type are identical in every way (shape, weight, etc.) and react the same way with other like-atoms (like group think).
3. Atoms from different elements (different types of matter) have their own individual features and ways of reacting chemically. (Each element has its own market niche, so to speak).
4. When atoms get together with one or more atoms, they move up to being a molecule. If they are all the same type, they are an element; if atoms from different types come together they are compounds.
5. In a chemical reaction, the atoms involved do a dance to become a different molecule; no atoms are created or destroyed in the dance.

*Is this all coming back to you now?*

***It is important to treat every chemical with respect.***

Any element, even oxygen, in the wrong place at the wrong time, either in too small a quantity or too much, can cause problems. Experts in the chemical industry tell us that there are no *good* chemicals for this reason.



*So is this 'soup of life' a point of concern? The answer is a definite maybe, as it depends on the form, amount, state, concentration and how **you** manage the chemical. While you do not control the chemicals nor the recipes that Mother Nature creates, you still need to treat her ingredients and her recipes with the utmost respect.*

However, there are other chemicals for which you need to take an even higher measure of care. These chemicals inherently carry greater risk, are typically 'man-made' and require special attention. Better chemical choices, and better management can have a positive impact on your business. Here's why. Higher risk chemicals cost more to manage, have greater impact on the environment and increase health and safety concerns in your business, again at a cost. The cost is not borne solely by you, and that's a growing problem.

### **How does what you do with chemicals in your business affect you and others?**

Every business buys chemicals, uses them and then has to dispose of them and the containers they came in. You may use chemicals daily either directly in your business process to make your products, in the delivery of services, or simply to clean up. Your input of chemicals may be a purchase of the chemical on its own or as part of a more evolved product, from a few litres to a few drums - small amounts. So what's the big deal?

## ***The challenge with chemicals is their chemistry.***

Chemicals react. The reaction they have is not always a bad thing; it can be great, like when you breathe. The problem arises when they react the way in which their chemistry dictates, but you hadn't anticipated. Oops.

If you didn't specifically ask for a chemical, but it came in the product you ordered, are you prepared to manage it properly? If it is a planned purchase, the reaction may still not be contained within the scope of your management control, or when a client gets it, or when it gets out into public areas, including the environment. 'Oops' is not helpful here.

*Here are three examples of everyday 'oops'.*

1. You've been assembling a huge model for a client; the glue contains toluene, which needs to be vented. The vent hood doesn't quite cover the model and the fumes waft through the shop. Everyone gets a really bad headache and gets sent home early - you lose production time.

2. You come home from a long day at work and walk in the house, forgetting to take off your shoes. Your shoes physically carry lead into the carpeted living room where your grandson is crawling on the floor - contact!

3. Your new janitorial service uses non-English speaking staff. In trying to impress their new client (you) they work really hard. When they accidentally knock a barrel of corn over, they sweep the corn remnants into the sewer. This turns into hydrogen sulfide and enters other buildings along the street through the traps in the floor drains and *tada...*their employees experience the lovely lingering fragrance of...you guessed it...that rotten egg smell. Aren't you popular!

### **Tips from Mother Nature**

**None of these situations unto themselves are going to result in a national disaster. But these are the chronic everyday releases; the daily drip of chemicals into the air, the soil, waterways, your bodies, my supply chain, and that is my concern. You need to manage your use of chemicals to minimize your impact and better your productivity. It can be done.**

## **So what can you do?**

There are three basic actions you can take.

1. Identify the higher risk chemicals and then avoid buying them.
2. Handle *all* chemicals with respect; some need more care than others.
3. When you are done with the chemical and the container it came in, you need to make sure that you dispose of it properly.

Okay, here's the next question—what constitutes higher risk? If that was on the tip of your tongue that gets you a brownie point. Unfortunately, there are lots of ways to answer this question. A brief look at the big picture can help you understand how to better manage the chemicals in your business.

There are about 23,000 chemical substances legally allowed in Canada that are part of an evaluation process led by the federal government. Of these, about 19,000 have been parked as not being of the greatest concern. The remaining 4,300 chemicals have been singled out for further review, and have been characterized as being of high, medium or low priority.

## **Why are these chemicals considered higher risk?**

There are three criteria used by the Feds to judge the risk priority:

- i. the chemical substance is *persistent and toxic*, which means it hangs around for a really, really long time and it is inherently bad for *any* of Mother Nature's customers.
- ii. it is *bio-accumulative*, as in there is a net gain of the chemical in a body over time; it does not break-down, it does not go away, and as it goes up the food chain it can become more concentrated. If you're at the top, *bon appetit*.
- iii. it poses a *high hazard to human health*, meaning it may be linked to cancer, birth defects, permanent genetic alterations, or changes to human reproductive or development processes.

The more you can do to avoid bringing these chemicals into your business, the better off you, your employees, your customers and others will be.

## **So how can you achieve this?**

## What chemicals are you buying now?

Chemical purchases are made directly as:

- ◆ input materials into a formulation to:
  - ◇ make a product,
  - ◇ be involved in a process or
  - ◇ enable a service
- ◆ finished 'off the shelf' products, such as cleaning or lawn maintenance products.

You also 'passively' buy chemicals that are part of packaging, and partially or wholly made products such as paper, cars, textiles, alloys, electronics, building materials, food and medicine.

**Make an inventory (a checklist) of all the chemicals you have in your business, regardless of their risk.**

## Now, how can you tell what chemicals should be considered first?

If the chemical carries one or more of these symbols, this should give you a hint. The more a product has, the higher a priority you should make it. These symbols are used throughout Canada. Click on any image for more information.



## What can you do about the chemicals that are deemed higher risk, either by your own evaluation or by publicly available criteria?

Pick up the phone and call your chemical supplier. Let them understand that you have made a decision to green your business. Ask them what they can do to help you. If they are evasive or uncooperative, be prepared to think about looking for alternate suppliers. It is advisable to know whether you have a number of other supply options before you table any statements about taking your business elsewhere.

## What if you are just buying chemicals from a retail store, such as cleaning products? What if most of the chemicals concerns you have are in other products? How do you know what to look for?

In North America, ingredients are listed in order of quantity on the package. The first ingredient in the list has the highest composition in the product. The last ingredient is present in the least quantity. Buyer beware though for there is a catch. Ingredient lists may not contain all the data. On some products only the "active" ingredients, those whose primary purpose is to achieve the main objective of the product, may be listed. Other ingredients which may have harmful health effects may not be listed at all. Even on Material Safety Data Sheets (MSDS), another source of ingredient information, suppliers are not required to list ingredients which make up less than 1% of a product.

**Labels are not foolproof.**

Some may say the remaining 1% is confidential, a proprietary blend, which is what gives their product an edge in the market. You need confirmation from them that the remainder is not a banned chemical, and preferably not one from the government's 4,300 chemicals of concern. If they will not provide this, is it time to look for a new supplier?

## What about buying chemicals off the web?

Increasingly, you can buy almost anything through the Internet and it can come from anywhere. While there is nothing wrong with buying online, you need to exercise caution. Buying from other countries, be it a chemical purchase or a product, may not provide you the same standard of care you expect. In Canada, firms that are part of the industry program called Responsible Care® for manufacturers and the affiliated Responsible Distribution® program for chemical distributors are held to an industry standard. As a buyer, you always need to be aware of what your purchase nets.

Low price is not the same thing as low cost. You need to ask questions to make sure that you are getting the best chemical for your needs and the one most aligned with Mother Nature's laws.

## Is there a cost to buying better chemicals as a management option?

In large businesses, case studies have shown that for every \$1 expended on the purchase of a chemical, the associated management costs can range from \$1 to \$10, with a trend to lowered costs with better management. However, there is a good argument to suggest that these costs could be higher on a percentage basis in a small business. Are you tracking these costs? What sits below the water line that makes the real cost much greater?

Every product and service has an environmental burden or footprint. Its weight or imprint can vary throughout its life from start to finish; as an input, in production, and in finished product or as a service component. You also need to find an appropriate and safe place for chemicals as waste to go afterwards.

At each of these stages, a company incurs quantifiable costs for labor, materials, equipment, liability, safety training and compliance efforts, which most companies do not track. Unfortunately, design, production and management decisions regarding chemicals are typically made without consideration of other hidden costs, or Mother Nature's laws.

There will likely be a price difference, but this may result in a lower total cost. Are you tracking all the costs that you incur in using a higher risk chemical? If not, here is a quick peek at peak costs and those underwater.



### Sample Case Study of Total Costs of Chemical Management

Purchase price	10%
Delivery	4%
What you see	14%
<i>What lurks below</i>	
Environmental, Health and Safety	10%
Inventory/Storage	26%
Use	16%
Inspection	10%
Emergency Preparedness	6%
Collection and disposal	18%
	86%

If you are able to eliminate the higher risk chemicals, you might add 10 to 20% above the waterline, and remove between 26% and 46% below, which would give you a net gain of 6% as a start. This does not touch upon the qualitative benefits like working conditions for you and your employees, less stress with fewer visits from inspectors, etc. Each small business needs to figure their own costs, as each circumstance is different. Getting a handle on these costs will help you figure out how to save money.

Your success in *going for the green* is up to you. Most small business owners understand the need to exercise better chemical management as there are additional, personal and community benefits to it. In contrast to these cost opportunities, poor chemical management has growing legal implications. If you leave this issue until the government comes knocking, you are a risk at risk. Do you want government to tell you how to manage your business? If so, get your keys ready. If not, get moving. Remember, this is foremost a question of respecting the laws of Mother Nature, and *she is a much harsher critic.*

## What can you do now?

### With your inventory or checklist:

- **Call your supplier and tell them you are greening your business. Get them to help you understand your options and the true cost of these changes. Firmly press for substitutes that will ultimately cost you less and lower Mother Nature's concern. Ask them about 'greener' chemicals.**
- **Call or go to the library and engage the help of your research librarian to find more data on chemicals that concern you. Finding data is their forte.**
- **Read the next two quick tips.**
- **Join [www.goingforthegreen.net](http://www.goingforthegreen.net), a network of small business owners that want to do what they can to green their operations. Your membership will give you access to quick tips on low cost solutions to green challenges, and more.**

## Chemicals - The real story behind the Mad Hatter and what you should learn from this

This is the second in a series of quick tips to help you better manage the chemicals in your business.

Do you remember the character of the Mad Hatter in "Alice in Wonderland"? As a matter of fact, Alice's Hatter didn't really fit the profile of a poisoned hatter of the day. He was argumentative and arrogant. So what happened?



A Mod Mad Hatter

During the mid-18th to the mid-19th centuries, mercury was commonly used to felt hats. Hatters inhaled the inescapable mercury fumes given off during the hat making process. It was common for hatters and mill workers to suffer mercury poisoning. Residual mercury caused neurological damage including confused speech and distorted vision.

It was not unusual for hatters to appear disturbed or mentally confused. Many died early as a result of mercury poisoning.

### ***Gives you a whole new appreciation for a bad hair day, doesn't it?***

These days there are strict rules on how to manage the health and safety aspects of a workplace.

The **W**orkplace **H**azardous **M**aterials **I**nformation **S**ystem (WHMIS for short) is a national approach for safe management of hazardous chemicals. It is legislated by both the federal and provincial jurisdictions. In all provinces, there are numerous sites that you can visit to get information on the rules that are there to protect you, your employees, your business and your community.

Set the rules and regulations aside for a moment. Any accident takes an emotional toll, and causes pain, even for minor accidents, even beyond those involved. It consumes time you do not have. There are medical costs, lost productivity, and as the severity of the accident increases, add government inspectors, police, and fire departments. There is a long list of downsides. The Workplace Safety and Insurance Board has some 'interesting' images if you need to be convinced.

*Let's agree that any accident is one too many.*

Now let's focus on just one thing — how to better manage the chemicals you have and use when they are in your business.

Look at your inventory or checklist. Your evaluation should identify the level of risk with any chemical you have, including your perception of risk. If you haven't done this, do it now. As you can see below, a simple matrix can be a useful tool. High risk criteria are usually pre-determined as they are entrenched in regulations. The lower risk criteria are yours to select. You could insert more detail by adding a line for each of the chemical symbols identified on the CMP 1.3 Info Sheet.

Matrix of Risk Level					
Rating	1	5	9	Total Score	Comments
Meaning	L	M	H		
WHMIS Chemical					
Has an MSDS					
Is on the Federal list of higher risk chemicals					
Requires special disposal					
Has negative media coverage					
Off the shelf product					
Carries green label					
Product of Mother Nature					

### **Tips from Mother Nature: Every drop counts.**

**You'll notice that the last criterion is for my product line. While my products are green, I have assigned them a low hazard rating, as any chemical incorrectly managed can pose a risk, even mine. Respect them all.**

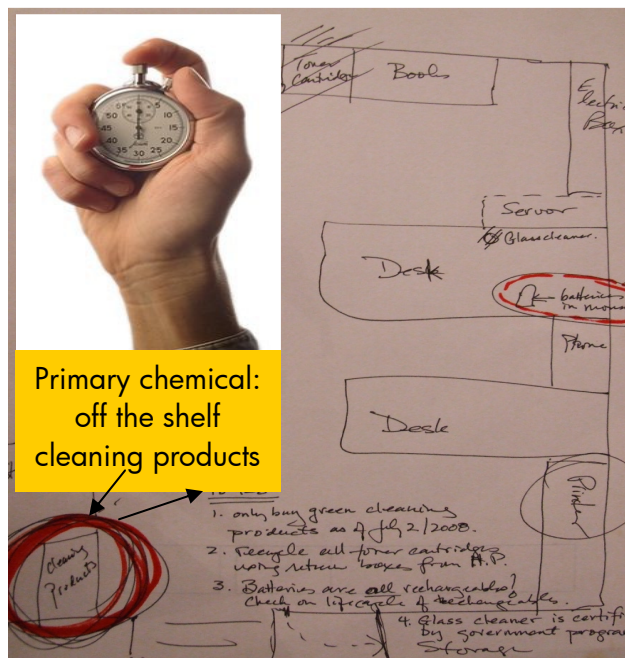
**However, for small businesses, the real challenge that I want you to address is the daily drip of chemicals you cause without thinking. The rest of this info sheet is to help you do just that.**

## Remember your chemistry refresher?

It's the nature of chemicals to react with other chemical substances, even in minor amounts, to become something different. So keeping tabs on where the chemicals are in your business and how you use them is just smart business.

## Where are the chemicals in your business?

A really simple and fast way to identify where they are is to *map their location* in your business, whether you have an office, a bakery, a manufacturing operation, a farm, or...



An eco-map of an office can take 5 minutes; and it doesn't have to be pretty to get the idea across... and decide what to do about it.

As a business grows in size or complexity, such as a manufacturing operation with 20 to 50 employees, it may take from 20 minutes to an hour or more to complete one eco-map. *It is worth doing as 80% of your environmental challenges are location-based.* So using this tool makes a lot of sense. It's easy to do and you don't need to be Picasso. If you haven't done an 'eco-map' before, read how to do it in "A Manufacturers' Handbook on Going for the Green". As long as your eco-map does not uncover a crisis in the making, the next best tool for a small entity is most often *good housekeeping*.

Good housekeeping can help you reduce up to half your environmental problems identified with eco-maps; i.e. 40%, with minimal cost. *This represents an important cost saving opportunity.* This technique includes five steps:

1. **Organize:** as order can enable efficiency.
2. **Neaten:** a streamlined layout improves the flow of activity and process.
3. **Clean:** it's easier to catch potential problems; the action can serve as a form of inspection.
4. **Maintain:** including routine maintenance; colour coding and numbering can be really useful.
5. **Eliminate:** don't store what you aren't using on an ongoing basis; return unused chemicals to your supplier. *Don't dump them down the drain!*

*Anyone can gain value from good housekeeping.*

If you need a ready made checklist to better manage your chemical issues, there is an Info Sheet that can help. But there is one simple thing that you can do to reduce the daily drip and reduce your chemical footprint right now.

**Read the instructions or directions, and then follow them. More is not better.**

Too many people just pour cleaning solution from a bottle without ever reading the instructions and accurately measuring out what is actually needed. Sounds too simple? Trivial? You're thinking, "not going to bother"?

**Do the math.** If every business in Canada used just one ounce more of cleaning solution than needed, that would be the equivalent of **one and a half Olympic-sized pools every week.** There are two assumptions on which these calculations are based. One, each business only uses 1 ounce too much (29.565 ml). Two, it suggests that the result is a sum of the daily drips. But it ignores the fact that chemicals react, so there is a multiplier effect.

### Tips from Mother Nature

**It is the product, not the sum, of all the chemicals in all your businesses that contribute to the daily drip, creating a chemical soup with no boundaries. And that is problem. And it is a growing concern. Measure and only use what you need.**

## Chemicals - The Real Cost of Waste and the Myth of a Place called Away

This is the third in a series of quick tips to help you better manage the chemicals in your business.

There are two interesting myths that tend to blur our understanding of the real cost of waste.

One is the belief held by many that the cost of waste is limited to the price of disposal. This is not true.

### Price $\neq$ Cost

Some products carry the disposal cost forward, factoring it into the purchase price. Some customers (you?) are unaware that this is occurring. There is a growing trend to advance charge for disposal costs, a surcharge, which may include recycling options where possible. Or not. It may appear as a separate line item on your bill, or not.

The other myth is the belief that we have a place called AWAY where we can throw things and our waste problem is solved. Wrong. If this were the "Gong Show", your ears would be ringing from the unending sound of the gong's striker.

### ***There really is no place called Away.***



The nature of chemicals gives this a further interesting twist. With chemicals, because they like to move around and 'make friends', i.e. they react and evolve into something totally new, pouring them down a drain, dumping in the back '40', throwing them into the garbage enables a new opportunity for them to become something different, and this is not always positive. There is no AWAY.

It is easy to say that the best way to ensure the safe disposal of chemicals is to not buy or use them in the first place. You do need to try hard to stop buying chemicals that even in small amounts are rated as *toxic*. There is a high probability that you already have riskier chemicals in your business—even household cleaners can carry one or more of the symbols identified on Quick Tip CMP 1.3.

Discussions around waste of any kind tend to generate a little heat. No doubt you have heard of the NIMBY syndrome, "Not in my back yard". Many public controversies around the environment start with waste. *Why is that?* Waste is the most visible aspect of the inefficient use of Mother Nature's resources. Whether it is seen as a collective: garbage, landfills, and litter, or seen by its component parts: old fridges with ammonia, cars with leaking radiators in junk yards; its all branded as being waste. So what can you do about waste?

### **First, what is waste?**

By definition waste is something without value. But many materials still have value, that's why there is recycling. There are some innovative uses for materials as inputs that are by-products of another process. Other wastes carry a large negative value, as in toxic chemicals or nuclear waste. The cost of disposal or care after use for these is not cheap. Maybe we need to rethink the term. Separating reuse and recycling options from the mindset surrounding waste might help.

### **How do you create waste?**

Waste is typically caused by one of these ten common inefficiencies:

1. Over production
2. Inventory
3. Waiting
4. Transportation
5. Motion
6. Over Processing
7. Quality Defects
8. Reprioritization
9. People's Skills
10. Energy (which is very tied to inefficiency in the first nine causes)

The movement around lean manufacturing, for example, is really all geared to identifying and eliminating the causes of these wastes. There are some significant savings to be made here.

## **Tips from Mother Nature**

**There is a 'theory' that all current production processes are 96% inefficient. That number kind of knocks your socks off, doesn't it?**

**Biomimicry is the art and science of trying to copycat the efficiency ingrained in the products and services I offer. While few of these novelties come close to my level of efficiency, there are some really interesting efforts underway and I applaud these. My R&D department has been at this for billions of years. Let me put this time period in perspective. If you compressed all of the planet's history into a 24-hour period, the presence of humans would take up less than 2 seconds. In a small percentage of that 2-second period, humans collectively have created a real mess. But you can fix this. Each of you just need to start by doing one positive thing. Be more efficient. Save money. It's a good deal for everybody.**

Not all inefficiencies create waste in the same proportion, nor are the costs of wastes of equal value.

## **What is the true cost of waste?**

***It's much more than you probably realize.***

There are three primary kinds of costs: financial, environmental and social. The financial cost of disposal includes 7 or more cost points, from purchase through to the tipping fee or disposal charge. That is if you do it correctly. Dumping waste out the back can come back to haunt you when you sell your business, as a contaminated property can reduce the value to a negative number.

There is an environmental cost, which is the impact waste has on the environment. Further there are costs to society including health costs, the tax burden, stress from community angst over landfills and litter, etc. It's a long list.

There are lots of good reasons to justify the time to figure out how to identify and reduce your chemical waste. This can help you eliminate direct costs and indirect costs. The latter act as a second layer of inefficiency that you are still paying for, taking away from your cash flow.

## **Do you see the opportunity yet?**

Flowcharting can be a good tool to help you identify common causes of waste. It's another simple tool and it can help you reduce your waste costs.

Flowcharting is a graphic representation of a sequence of steps needed to carry out an activity. It's basically drawing a picture using standardized shapes, each with their own consistent meaning. It can help you see where your process is inefficient. It's as simple to do as an eco-map. It can help you see where unintentional outputs occur, such as spills or minute emissions. The more information you can pull together inexpensively, the better the chance you have to save money, get money or make money. You will also be greening your business at the same time. And this is a good thing, for you, your customers, your kids and you community. *Right?*

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**A small business owner is a busy person. Quick Tips have been designed to provide you with periodic tips and concise summaries on how to green your business. Every other week a new Info Sheet will outline challenges to greening with ideas that you can act upon quickly.**

**Put them on your birthday or Christmas wish list, or visit the site to sign up now.**

**Your feedback will determine the topics researched and provided.**

**[www.goingforthegreen.net](http://www.goingforthegreen.net) offers other tools designed for small business owners and managers to help you green your business and save money, get money and make money.**