Directing Discontent: Consumption and Contamination Impacts

By John Pearson

Researching and writing on extreme energy and, in particular, the tar sands being extracted in Alberta, Canada, presents facts (both questionable and accepted) which shock and appall. However, upon consideration of the phenomenon in the broader contexts in which it undeniably resides, those of energy security, geopolitics and development to name but a few, realism about such projects inevitably emerges. These realities necessitate, paraphrasing conventional wisdom, acceptance of that which we cannot change, courage to change that which we can, and the wisdom to know the difference.

The abandonment of the two high profile examples of 'extreme energy,' the tar sands, and fracking in the USA and UK, is therefore unlikely. Our reliance on hydrocarbons is undeniable and as conventional reserves dwindle, the allure of unconventional sources grows. Denying our inextricable connection to them for the foreseeable future is, objectively, remiss. Progress towards alternatives continues unabated but expecting developments to come to fruition and 'rescue' us from our daily need for hydrocarbons and derivatives thereof would be naïve. As such, activists and environmental lawyers must accept that unconventional oil and gas extraction is inescapable in the short term. Essentially we are not able to break our 'addiction to oil.'

The ultimate goal of activists should still be eliminating the use of hydrocarbons altogether; indeed such aspirational aims are needed to drive such activities. However, these are undeniably long term goals. Thus short term focus should be on objectives which can be achieved within that timeframe. Examples of issues arising from both the tar sands and fracking operations can be divided into two broad categories. These are the consumption of other resources to extract unconventional hydrocarbons and the contamination (and adverse effects) that it is suggested, extraction processes give rise to. This distinction illustrates a regulatory challenge as these categories necessitate distinct regulatory approaches.

Concerns with regard to resource consumption in both fracking and the tar sands involve water. Vast amounts of water are utilised to extract raw materials from the earth and in the post-extraction refinement of tar sands. Estimates of the water consumed to produce oil from the tar sands range from two to five barrels for each barrel of synthetic crude produced. To most this is a perplexing and almost ridiculous ratio. Similarly to fracture rock formations releasing the natural gas sought in fracking, copious amounts of water and chemicals are used to expand existing faults. In the tar sands and fracking industries however, there are substantial incentives to increase water recycling. Such water consumption is capable of being reduced, and companies invest considerably into researching methods of doing so, through recycling or the use of alternatives.

Extractors strive to regulate usage and tar sands extractors are forced to by the strict licensing of water withdrawals. Licensing in Alberta perpetually lowers consumption by reducing the volume allowed to be removed from natural water bodies if the quota allocated is not exhausted. Water extraction, transport and licensing costs themselves are prohibitive, and partly controlled by regulatory authorities, not market forces. Firms are incentivised to reduce potentially damaging

water consumption by regulations which exploit existing economic motivations. In essence the system exploits market forces influencing all firms to promote good environmental practice, making the decision to act in a responsible manner 'good business sense.'

The impacts of contamination are, by contrast, not as easily managed. A major concern regarding the tar sands is the effects of 'tailings ponds,' vast man made pools of by-products from extraction and refinement processes, in some instances toxic, which have caused considerable bird deaths, and are suggested as leaking in significant volumes into the surrounding ecosystem. The impacts of fracking courting controversy are the seismic consequences of the practice and the seepage of the fluid used to cause the fractures exposing the gas sought. In both cases the extent of the adverse effects of the practices is not known. Such an accusation could be levelled, and is conceded in relation to water consumption by tar sands industries. The impact of the water removed is not fully known, however the volume itself is strictly controlled and monitored. Commonalities are few, but the differences between the management of consumption and contamination are numerous.

Consumption can be measured with incredible accuracy by regulators and extractors, but the degree of contamination by contrast is not easily ascertained. Thus imposing targets in relation to them with any certainty as to effectiveness is extremely difficult. In relation to fracking in particular, the fluid mixture utilised to expose and expand fractures varies by operator, and even between wells. Thus measuring the level of contamination from them is fraught with difficulty. Similarly the volume of seepage from tailings ponds would vary by pond, as would the concentration and composition thereof. Indeed the impacts of contamination vary wildly in response to innumerable factors. To take just the tailings ponds themselves, the size, location, rainfall, and construction of a single pond, as well as their contents, might alter said seepage and any impacts of the material upon the surrounding ecosystem. Similar issues arise owing to the variance in location of wells and fluid used by companies fracking for natural gas. Regulating the level of contamination in such instances is therefore liable to being plagued by inefficacy.

The second distinction between consumption and contamination impacts is in the development of the adverse consequences which result. Consumption has immediate and quantifiable effects, such as withdrawal of a particular volume from a water course or body. The resultant secondary impacts of consumption are therefore potentially measurable themselves and can be attributed, largely incontrovertibly, to that action. In the case of contamination however attribution is not as easily achieved. As well as the variance in physical factors outlined above, the duration of development to quantifiable and assessable levels is also unpredictable and subject to innumerable influences. Often the impacts of such consumption, although long lasting, become apparent within a relatively short timeframe. For example, the effects of the extraction of large quantities of water from rivers and streams are often apparent, though not fully developed, within a seasonal cycle. The uptake of the various components of tailings by contrast can take much greater periods of time to take effect or become identifiable. Numerous reasons for this can be cited, for example, the migratory nature of large mammals, such as caribou, prevents harmful substances within a food chain accumulating as rapidly as they otherwise might. The relatively small number of humans eating native animals from the regions affected would also make impacts unlikely to be identified swiftly. Similarly the long term impacts of injecting fluid into the ground, or leaks from some well heads seeping into the water table, are unknown and not always attributable directly to extraction processes owing to a similar

temporal disconnect. Indeed in many cases the original source of contamination will have abated or become less severe before the true extent of damage incurred is realised.

The difficulty in identifying and attributing the impacts of contamination caused by such projects ensures that measures to regulate the industries involved are based upon precaution. The precautionary principle is a mainstay of environmental protection and enshrines a number of basic elements. That any damage reasonably perceived as potentially arising from an action should be mitigated to the greatest degree possible, that potential damage be balanced with benefit gained, and that the burden of proof in suggesting an action is not harmful or that an action should proceed in spite of the risks lies with the actor. The principle does not require all risks to be considered, or that a project cease due to any potential damage. Although the burden lies with the actor to prove that the action is harmless or relatively undamaging, if no significant damage can be shown to occur rarely are permits declined. Certainly this has been the case for the tar sands and fracking industries. The burden of proof of risk simply has not been breached. Herein lies a considerable challenge facing the regulation of extreme energy, and where the distinction between consumption and contamination impacts is most stark. The unknown nature of the impacts of contamination, in terms of form and extent severely inhibit regulation in effectively mitigating or eliminating damage.

This can be illustrated clearly by contrasting them with consumption based impacts. The consumption of any resource to provide a product, such as natural gas and synthetic crude oil, bears inherent costs. These may take the form of regulatory charges, equipment, transportation, or simply the resource's purchase price. As such there are constant pressures to reduce costs and remain competitive. This results in reduced consumption and more efficient practices and, coupled with a desire to at least appear 'green' or environmentally minded in operations, is a relatively effective and self –perpetuating method of ensuring efforts to reduce consumption and its impacts.

Contamination impacts however, once mitigated to a degree necessitated by the nature of a by-product, are of negligible cost to the extractor unless they can be attributed incontrovertibly to them. Only then may they potentially give rise to a basis for legal action against either the licensing authority or extractor. The difficulties of attribution and the temporal disconnect between extraction and impact common in many such industries, reduce the likelihood of success of actions. From an ecological perspective they are also the greatest concern. The impact of consumption by volume would be reduced from the outset, the drive for profits promoting the reduction in costs by industry. Whilst this does not account for rises in output or demand, as reductions might be outweighed by increased extraction, meaning net consumption would not fall, progress would undoubtedly be made at a greater rate than were these factors not present. Contamination impacts beyond storage or disposal of by-products cost the industry relatively little unless adverse effects are proven and attributed. Research into improving the reclamation of the tailings ponds is ongoing, and is subject to cumulative efforts by extractors; however the licensing and leasing processes do not stipulate requirements in this regard beyond a broad, non-committal suggestion to return the land to an equivalent capacity. Thus the financial incentive to reduce contamination is far less, and this is one of the most potent methods to ensure compliance or action on the part of private commercial actors. The consistent reductions in water consumption by the tar sands industry reflect this reality.

The challenge is in accepting that the use of increasingly extreme methods to obtain oil and gas resources is inevitable in some degree. The fracking and tar sands industries will not cease their

operations by choice or regulation in the foreseeable future. After this realisation however, those concerned with the impacts of such industries must choose their battles carefully. The existence of regulations concerning reducing consumption, as well as the financial incentives has proved more effective than activism thus far. This is not to say activism is ineffective or without its place, more that it should be directed to areas where there is less inherent incentive for industry to act in the manner sought. The free market has been one of the most effective means of promoting actions on the part of companies, and extreme energy projects are no exception. Whether regulation could emulate or mimic economic incentives is questionable, but activists, regulators and lawyers alike should focus upon contamination. The unknown nature of both cause and effect of impacts which stem from contamination make them a far more pressing concern than those which are subject already to concerted efforts to be reduced, and the extent of which can be assessed. As such in efforts to restrict the inevitable exploitation of sources of extreme energy, the focus should be on that for which precaution cannot be exercised, and there is negligible existing incentive to reduce. We cannot change the continuation of such projects in the short term and their ever-decreasing consumption of resources, but we should have the courage to change that which we can, contamination, and have the wisdom to know the difference.