

**X. Waste Not**

## ● Waste Not

For most of human history, the accepted way of dealing with wastes was to dump them on the ground or in a hole somewhere out of sight and smell, or burn them, or drop them into bodies of water (dilution being the traditional solution). But after the deadly effects of hazardous waste at Love Canal and other sites were recognized (brought to the attention of authorities by individuals like Lois Gibbs), and after the scandal had spread to include leaky waste dumps all over the country, all over the world, it became obvious to all but the most reactionary traditionalists that we could no longer just sweep stuff under the rug or toss it into the environment. *We all live downstream* and *Not In My Backyard* became popular slogans. The problem even made it into the funnies: looking out on an Okefenokee befouled with trash, Pogo, in what is probably Walt Kelly's most famous line, said "We have seen the enemy and he is us."

Written in the 70s like most of our other major environmental laws, RCRA (the *Resource Conservation and Recovery Act*, 1976) and CERCLA (the *Comprehensive Environmental Response, Compensation and Liability Act* or "the Superfund," 1980) were intended to achieve systematic clean-up of existing wastes and prevention of future problems through implementing of rigorous high-tech practices. In the 80s and 90s, with relatively undiminished production of wastes and inadequate clean-up of waste dumps, laws, regulations, public opinion and progressive industries began to draw attention to the advantages of pollution prevention at the front end of the production cycle rather than clean-up at the end of it, but the mountains and swamps of waste from past production were there to be dealt with, no matter how much was prevented by new production methods.

Recovery, removal, remediation, waste-mining—a variety of new approaches were introduced, especially for legally-defined "solid" (i.e., comparatively non-hazardous) wastes, but some of the old treatment and disposal methods, known to be polluting, were still allowed and since these were often highly profitable for polluting industries and waste management companies, many of the most contested environmental reform struggles were over proposed hazardous waste treatment and disposal practices. So-called "disposal" by incineration, allowed under RCRA, was one of the most contentious issues.

While agencies and industry lawyers held that incineration was a valid hazwaste disposal method (as it had long been considered to be for wastes in general), toxics activists insisted that incineration was, as Greenpeace put it, only *a waste dump in the sky*: disposal in the sense of dispersal, not in the sense of destruction. Instead of really getting rid of the toxics, incineration only spread it around, and often compounded chemicals (e.g., dioxin) more toxic than those in the feedstock.

Incineration of industrial wastes had become a major issue globally; toxics spewed from incinerator stacks in a great many countries (including many third world or "developing" nations where first world countries for a fee "disposed" of their unwanted wastes) were polluting the whole world, with high levels showing up even at the poles. Walruses found washed up on northern shores were so contaminated with toxics that if they were in the lower forty-eight would have had to be classified as hazardous waste.

International technical standards for incineration of persistent organic pollutants—POPs, chemicals considered to be so dangerous that their production and use had to be totally and globally stopped and already-existing quantities utterly destroyed, the molecular structure of their chlorinated hydrocarbons radically disintegrated (which required incineration at a minimum 1800°F for feedstock-specific durations)—was established by the 2001 *Stockholm Convention*

on POPs. But before that (and afterwards in places where the POPs Convention was inoperative) activists took incinerators on one at a time. In Arizona, it was a facility proposed as a “public-private partnership” (a favorite concept of the Reagan administration) between the state and the Arkansas-based company ENSCO, to be built in Mobile, a community of people of color in an economically-depressed cotton-growing area south of Phoenix.

The ENSCO permitting process went on for months, and the state Department of Environmental Quality (ADEQ) had recommended approval to EPA (which held *Clean Air Act* and RCRA final authority in the state) and had scheduled a public meeting on the draft permit to be held in Mobile. Environmental groups had been getting ready for weeks. Greenpeace had been organizing among local groups for a peaceful demonstration. Acting on behalf of the Sierra Club and several smaller groups, I had been giving talks and writing articles in a number of venues, submitting comments to ADEQ on a series of draft permits, and giving testimony to the state legislature. We knew the media would be there in force.

As the small school building set aside for the meeting began to fill up, it became obvious that it was inadequate for the number of people. ADEQ had anticipated that (had planned for it) and had set up monitoring screens, loudspeakers and chairs outside the building for the overflow crowd. Rather than having the potentially unruly demonstrators inside in force, agency employees would call one by one people who had signed up to speak. People outside complained, some more loudly than others, that they were not really being given a chance to participate in the meeting, only to be spectators and comment. Police were there in significant numbers.

I had arrived early and had a seat in the front row directly in front of the EPA and ADEQ officials. I had prepared for the meeting by completely shaving off my well-trimmed full beard for the first time in years. People had seen me before in the standard uniform of blue blazer, chinos and necktie, but not without a beard, and even people I regularly worked with didn't recognize me. I had planned to make my usual very rational arguments for denial of the permit, but that changed when the generally quiet demonstrators outside began objecting loudly to ADEQ's decision to keep people outside from bringing their signs with them when they were called in to give their comments. The situation rapidly deteriorated, with police preventing people from entering, physically restraining them, using cattle-prod-type stun-guns on several, hauling several to the waiting paddy wagons and to jail.

Many of the chairs inside were emptied and knocked over as people moved to see what the commotion was and to join the demonstrators outside. I talked myself into keeping my seat during the melee. By the time ADEQ decided sufficient order had been restored and I was called to speak, I was nearly livid with anger. At the podium and microphone, in front of the cameras, before delivering my prepared comments, I vented my extreme disappointment that this EPA was not the agency we had created with NEPA (the 1970 *National Environmental Policy Act*), denounced ADEQ for the arrests and denial of free speech, and berated the bureaucrats— many of whom I knew well and worked with on many issues—for their obvious denial of the rights of people to fully participate in the legal process. I had never before given such an emotional public statement, and I've never regained the trust in government I had before that night.

The news that night and following morning headlined the arrests, with shots of police dragging people off. A few days later, ADEQ announced that there would be a follow-up public meeting in a large convention hall in downtown Phoenix. Two thousand people showed up, the largest meeting on environment the state had ever had. Of the several hundred speakers, only a handful spoke in favor of the permit. Within weeks, it was officially denied by the state.

Over the next few months, environmentalists worked with lawmakers, ADEQ and industry to craft and pass a progressive Omnibus Hazardous Materials bill which highlighted the Precautionary Principle and included provisions for pollution prevention, waste reduction and risk reduction, and effectively prohibited hazardous waste imports to and hazwaste incineration in the state. Then for several more months, we were engaged in drafting regulations for the new statute, a process which involved my sitting on several committees that addressed one or more of the technical waste classifications (medical, bio-, liquid, radioactive, special, etc.) defined in the state and federal laws, established oversight and public participation procedures, etc.

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A decade later, residents of the valley where I live asked me to get involved in their efforts to prevent a garbage incinerator in Pearce, a small town at the north end of the valley. I agreed, and started going to meetings with concerned residents to get a campaign going and plan for the eventual public meeting on the draft permit-to-be. A few weeks into the process, I had a request from the local People for the West group to meet with them in Elfrida about the incinerator issue. I knew that some of the members of the group were among those who had, not too long before, by showing up with six-guns on their hips convinced county Planning and Zoning employees to call off the meeting they'd planned on the department's proposed county-wide development plan.

I arrived at the PFW meeting a few minutes early, was invited to enjoy the potluck dinner (including the obligatory pot of nominal Spotted Owl stew), listened while the pledge of allegiance was recited and the President of the group gave her opening remarks, which included quotations from George Washington and Thomas Jefferson. I began giving my standard introduction to incineration talk, emphasizing that among the pollutants put out by garbage incinerators are dioxins, which were actually created from plastics in the feedstock rather than destroyed because the temperatures in such incinerators never got anywhere near the minimum heat needed to destroy the dioxin. I was talking about the dispersal of incinerator emissions, noting how the dioxin could end up in "our soil, our water, our crops and livestock. . ." when the President from the back of the room said loudly, "Michael, don't forget, it will get into people too."

The rest of the meeting went smoothly. A few months later, at the public meeting in Pearce, many of the PFW members told ADEQ to deny the permit, as did a considerable number of Vietnam vets and their relatives from around the valley, many of whom after they gave their comments at the podium came to shake my hand for my helping get out the word about dioxin and Agent Orange.

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In their arcane journals the doctors tell us  
what the bureaucrats are afraid to admit  
that more people are sick than should be  
that children are dying at abnormal rates  
around the edges of our waste dumps  
even faster than those who live inside  
the urban cloud where most wastes come from,  
where the air itself is poison the water  
piped in through pipes that leak poison the food  
trucked in pumped full of commercial poisons

—hormones preservatives pesticides  
growth and flavor and appearance enhancers  
cosmetic aids not so unlike those  
the dead are treated to by the mortician.

Slow poisons, hard to detect at first,  
hard long after the fact to prove,  
harder still to prosecute when laws  
are written by the poisoners  
to make toxic chemicals innocent  
until proved guilty as if they were people,  
putting the burden of proof on the victims  
in the name of free enterprise  
progress family values scripture and freedom  
to put toxins into products with no  
responsibility for where they go  
once the products are used up  
disposed in waste dumps and incinerators  
around which people die unnatural deaths.

“Waste”  
*Mr America Drives His Car*



## **Hazardous Waste Transport (1980)**

Michael Gregory, KSUN-FM (13 May 1980)

The history of railroad accidents in the Benson area makes entirely reasonable the prohibition that the Benson city council has placed on the parking within that city of railroad cars containing hazardous materials.

The council is correct in stating that no private or governmental response network exists in Arizona to deal with accidents involving toxic substances. Some time ago I joined with a number of people from Cochise and Pima counties, including Supervisors Judy Gignac and David Yetman, in petitioning Governor Babbitt to establish an adequate response system. The Governor replied at that time that such a system was in the works, but bureaucratic and legislative delays have prevented his program from getting off the ground over these past few months.

Meanwhile the state's highways and railways continue to carry thousands of uncontrolled shipments of hazardous materials through our towns and countrysides—from uranium concentrate out of the mines near Green Valley and Wickenburg, to high-level plutonium fuel rods from out of state power plants to out of state waste dumps; from toxic chemicals like chlorine near Wickenburg to PCB's near Willcox to ammonia on its way to Apache Powder near Benson.

There is no single agency in the State responsible for regulating this transport, and although the safety record of transporters cannot be called reassuring, there is not adequate response system for accidents involving hazardous materials. In the absence of such safeguards by the state and federal governments, city ordinances controlling transport (as with the ammonia in Benson) or controlling manufacture (as with radio-active industries in Tucson) seem to be a most reasonable way for people to protect themselves. Other municipalities in the state might well consider adoption of such ordinances as have a number of towns and cities in the industrialized East.

## Dealing with Hazardous Wastes (1980)

Michael Gregory, KSUN Bisbee, Arizona (20 August 1980)

Recently I took part in a three-day conference on hazardous wastes, those unfortunate by-products of technological progress. In general I was favorably impressed by the efforts of EPA and the Arizona Department of Health Services toward implementing the *Resource Conservation and Recovery Act* (RCRA) of 1976, which was written to soften the environmental impacts of our industrial Frankensteins. As usual at such events, I was also disappointed to learn just how serious the problem is, and how much current laws and regulations leave uncontrolled.

Hazardous wastes are a serious problem. US industries annually generate 57,000,000 tons of hazardous wastes—chemical and biological toxins, explosives, corrosives, radioactive materials, etc. Some 90% of these wastes are disposed of by means that violate even minimum health and safety standards. Thousands of unregulated and unknown dump sites all over the country, says EPA, are potential catastrophes like New York's Love Canal and Kentucky's Valley of the Drums.

At present there are only 5 off-site facilities in the US supposedly capable of storing the most dangerous non-radioactive wastes; by the time EPA's new regulations become effective in a few years, 35 will be filled to capacity or otherwise inoperable. There are none now and none in the foreseeable future to handle high-level radioactive wastes like those from nuclear power plants.

There is no adequate dump in Arizona, though we generate some 100,000 tons of hazardous solids and 6,000,000 gallons of hazardous liquids annually, the most serious of which we truck to dumps in Beatty, Nevada, and central California. Much of the less obvious stuff is dumped illegally or spewed without regulation into our air and water.

The State of Arizona has just submitted to EPA a set of proposed regulations for identifying and controlling hazardous wastes in the State. If approved, which with minor modifications they probably will be, the regulations would set up a framework for providing so-called "cradle-to-grave" surveillance of these substances. Part of the proposal included the development of a State hazardous waste dump.

Much time was spent at the conference, as much time and taxpayer money have been and yet will be spent in Phoenix over the vexing questions of whether or not we should have a State dump, where it should be, and who should own it. Last year the Department of Health Services surveyed the state for potential dumping grounds that would meet EPA-required environmental criteria—impermeability of ground, proper distance from ground and surface waters, low runoff history, etc. They came up with nine possible sites. One was in Cochise County, but the three best suited to the purpose were all in Yuma County.

Understandably, the people of Yuma County are not too happy about that. They tend to believe, and I must agree, that since 85 or 90% of our hazardous wastes are generated by and for Pima and Maricopa Counties, that is where they should be stored, But nobody wants the garbage in their own backyard.

The problem is the same nationwide: 26 of the 65 Class I dumps are in California; most states don't have them and don't want them, and there is a growing resentment in states that do have them against taking in the wastes of states that don't. A Supreme Court decision has prevented any individual state from prohibiting interstate use of its dump facilities, but since the current sites are filled up or condemned (dump facilities being good for only a few decades at most),

there is no law that requires a state to open a new one; and even were a dump to remain open, that kind of political animosity can cause a lot of extralegal difficulties.

If we accept the insatiable demand of the urban mentality for technological experimentation, the proposal for a State dump is probably sound, and the proposed ADHA regulations should result in a few years in effective management of most of the worst physical and chemical pollutants produced by our industries. But we should not let the political problems of disposal siting distract our attention from problems not addressed by the current regulations.

The regulations do have some serious shortcomings. For instance, they exempt industries or individuals who generate less than 100 kg of hazardous waste monthly, though it is obvious that 100 kg of many regulated waste products (dioxin, plutonium, various microbes, etc.) is enough to kill millions of people.

Radioactive materials, though covered by RCRA, are not dealt with in the current regulations. EPA, in response to citizen lawsuits, has begun trudging toward some regulation of airborne radionuclides in compliance with the *Clean Air Act*, and purportedly plans to promulgate regulations in the foreseeable future to control radioactive wastes; meanwhile, radiation regulation, or lack thereof, is carried out by federal and state nuclear energy and water pollution agencies and, of course, by the Departments of State and War.

Mine wastes are specifically exempted from the Arizona draft regulations, though all agencies agree that the laws mandate clean-up and penalties for hazardous mine wastes. Instead of clear-cut standards and procedures such as the regulations establish for other hazardous wastes, for controlling mine wastes we are left with the same mishmash of agencies and jurisdictional conflicts that led to the confusion in dealing with asbestos in Globe, the chlorine spill in Kingman, and the radioactive contamination of the Rio Puerco on the Navajo Reservation.

In short, the proposed regulations do not address the problems of controlling hazardous wastes like smelter emissions or mine tailing dust that cannot be neatly packaged in drums or underground vaults; and they do not address the complicated bureaucracy required to enforce the regulations and to carry out the many spin-off plans, studies and emergency actions the regulations require.

Some headway is being made in this regard, however. Following widespread concern last year about the transportation, Governor Babbitt (with the skinflint help of the Legislature) has begun a number of improvements in the State's capability for handling wastes. The Arizona Division of Emergency Services has been strengthened under Babbitt's program, and is responsible for coordinating the complex interagency network for responding to hazardous waste spills, accidents, and the like.

The Arizona Corporation Commission also plays a major role in the program. The Commission is the lead agency for enforcing trucking standards in Arizona. Most hazardous waste shipped in and through the state is trucked, and 50% or more of the trucks, according to ACC officials, are unsafe. Most of the hazardous materials (waste and otherwise) shipped on our highways travel incognito: no record is kept of contents, whereabouts or destination. Under these conditions, an accident on the highway has a more than random chance of being a disaster, and the risk increases daily as intra- and interstate commerce of our gross national product grows.

Transportation offers perhaps the clearest point of control for these materials, and many problems will undoubtedly be averted by tougher inspection of vehicles and registration of all interstate shipments at the border inspection stations. But surveillance of wastes enroute to their

burial rounds, like surveillance once they are there, must be accompanied by both adequate emergency response capability and an active prevention program. The last of these is at only rudimentary stages of development in the Governor's program, due in no small part to the Legislatures failure to adequately fund the State Laboratory.

At present the State Lab is not able to deal with even the most routine problems of hazardous waste contamination. Most analyses must be done out of state, often resulting in intolerable delays and uncertainties of interpretation. A properly equipped and staffed laboratory would greatly improve both our emergency response capability and our ability to monitor generation and disposal sites to detect contamination before it becomes catastrophic.

We must also, it seems to me, increase our efforts to develop a picture of statewide health patterns and trends. The State cancer registry approved by the Legislature last fall is a step in this direction. We need to develop epidemiological surveys for other pollutant-related diseases—such as those caused by asbestos, arsenic, sulfur dioxide, tritium, radon gas and silica dust.

But it may be that what we have most to do is that thing least considered at the conference, or in Phoenix, or in Washington. Maybe we ought to take a little time from thinking up ways to manage all this garbage and consider how to stop producing it. Hazardous waste dumps and the whole effort are finger-in-the-dike expediencies based on a vainglorious pie-in-the-sky science-will-save-us-in-time mystique. Maybe we ought to forego the self-fulfilling prophecy of unlimited economic/population growth and after-the-fact regulation of the concomitant poisons, in favor of preventive regulation and a lifestyle whose quality does not depend on petrochemical goodies and radioactive electricity to run them.

I am heartened by the example of Tucson and a number of cities in the industrial east which have written local ordinances against the manufacture and transportation of substances they don't want within their boundaries. Similar sanctions can be enacted by any county or municipality. I applaud the state and federal efforts to protect us from ourselves, but ultimately protection begins at home with the exercise of our freedom to live the kind and quality of life we want. Without that kind of self-determination we may as well be dead, whether from industrial cancer or some other cause is of little matter.

## **Recycling Solid Waste (1980)**

Michael Gregory, KSUN, Bisbee, Arizona (4 October 1980)

Recycling of resources is almost an instinctive trait, as attested to by some of the earliest agricultural and mineral operations of mankind. One you've played out a mine, what could be more natural than milling through the tailings piles to see if you missed anything of value. One man's trash is another's treasure, and our natural acquisitiveness and ingenuity have from the beginning prompted us to sift through our neighbor's discards.

It was not until the mid-twentieth century, though, that recycling of urban industrial wastes became an environmental and financial necessity. And it has only been for a decade or two that recycling the billions of cubic yards of solid wastes we produce has become politically and commercially feasible.

Today, everyone knows that recycling pays, that it produces positive medical and psycho-social as well as market values. From family can-collecting expeditions to leaching operations like those at the Bisbee mine, we have learned one of the major lessons the Ecology Movement of the 60s set out to teach us: we can't afford to squander our resources or bury ourselves in our own waste products.

The regulations from the federal Environmental Protection Agency and state Department of Health Services have begun to stimulate a healthy interest in waste disposal in Arizona; during the enthusiastic planning period that is bound to follow the issuance of state and federal incentives, and in our panic at the price of atomic and fossil fuels, I hope we can keep in mind the subtler lessons we are just beginning to learn as the number of Love Canals and Three Mile Islands pile up, as more impartial tests are conducted and their results disclosed, as the incubation period for environmental poisons terminates and threshold limits are reached.

Recycling is not always the straightforward simple solution it seems. We need to carefully consider the side-effects of any waste-recycling we undertake.

A case in point is the proposal for a waste-recycling program recently presented to Bisbee, Douglas and Cochise County officials. Under a plan presented by the Tempe-based Resources Reclamation Corporation of America, wastes from the southeast part of the county would be trucked to a central recycling center where processing would extract valuable metals and compress remaining combustible wastes into small, saleable fuel pellets worth about \$40 per ton.

Environmentalists have long advocated the use of dump materials rather than their destruction, and on the surface this plan seems highly commendable. It has some pitfalls, however. I wonder, for instance, about the economic wisdom of turning over such a profitable operation to a private company when it might better be publicly-owned. The record of private industry in meeting fiscal and social obligations in regard to waste disposal has been poor at best, and lax enforcement policies do not lead us to suspect better treatment in the future.

But regardless of whether such a site is publicly or privately managed, some serious questions remain about the conversion of solid wastes into burnable fuel pellets. Just as we have found that in the recycling of mine wastes there are subtle radiation side-effects, so are there potential problems with the handling of other solid wastes.

The open burning of dumps has been recognized for some time as not only a public nuisance, but

as a health hazard. The practice has been largely prohibited not so much for its visible and olfactory insults to our systems, as for the unseen toxins released into the atmosphere by dump fires. Plastics, fertilizers, pesticides and other synthetic chemicals, for instance, may contain a variety of poisons which are set free, some made even more poisonous, by fire. The carcinogens Vinyl Chloride from white plastic water-pipe and Tetra-dioxin from exterior plywoods treated with penta-type wood preservatives are only two of the better-known toxins resulting from burning normal waste contents.

Would the contractor for our garbage-recycling plant as a matter of routine sort through the piles to separate materials whose toxic effects would be disseminated or intensified by burning? Not very likely, unless the contract clearly stipulated such a procedure and provided for strong penalty and insurance safeguards.

We are accustomed to think of fire as a cleansing agent, and it is when we are dealing with most biological materials like hospital waste or diseased livestock. But fire applied to today's dumps is more likely to result in a chemical stew that poisons our water and air. Any feasibility study for setting up a new waste treatment center ought to take these facts into account.

## **Toxic Wastes and Taxpayer Expense (1980)**

Michael Gregory, KSUN-FM (28 November 1980)

The Toxic Waste Superfund bill just passed by Carter's lame duck Congress will not emerge in a final form suited to fully accomplish its purpose, but it will go a long way towards correcting the hazardous waste dump problem on the national level by setting in motion the slower process of state and local implementation of the law and the policies surrounding it.

One of the major flaws of the bill is that it puts too much of the cost of clean-up on the taxpayer, instead of on the chemical producers and dumpers themselves.

That is a fault that runs through almost all laws and regulations dealing with chemical proliferation and pollution. The Arizona state rules for hazardous waste transportation and disposal are being worked out, for instance, at great expense to Arizona taxpayers solely for the benefit of the industries being regulated.

The hearings beginning on December 4th in Tucson on the Department of Health Services' quest for a state hazardous waste dump are a case in point.

Arizona industries produce some 6 million gallons and a quarter million tons of hazardous wastes each year. ADHS expects those amounts to increase by 125% in the next decade. The only official hazardous waste dump in the state, the Hassayampa Landfill in Maricopa County, closed last week since it could not operate within revised EPA health standards. The interim Los Reales dump south of Tucson is clearly inadequate for handling the kinds and amounts of wastes we have. This means that most of our wastes must be shipped out of state, at some expense to the producers and consumers, and at some increased risk of transportation accidents.

Faced with this situation, various state agencies with the Department of Health Services in the lead, have undertaken to locate and initiate development of an in-state dump site.

Supposedly taxpayer costs would be limited after that time to policing the operation, since no one in Phoenix seems to seriously consider operating the dump as a public-owned business. After writing the regulations, locating the site or sites, advertising for finding an operator, general monitoring and enforcement would be the state's only expenses.

But trying to control hazardous wastes by regulating dump sites is sort of like trying to steer a horse by the tail. The bureaucratic response is not a solution to the problem, only an accommodation and an incentive to greater problems in the future. The attempt at public control of toxic pollutants—already feeble in Arizona to being with—is all but defeated by a switch from control to management, from management to maintenance, each step accompanied by advertisements encouraging more polluting industries to settle in Arizona, requiring more hazardous dump sites in the future, with continuing taxpayer costs.

Government propaganda has suggested that we need an Arizona dump for Arizona wastes, but the establishment of an official Class I dump in Arizona would not only act as an incentive to production of more toxic substances in the state, but would draw wastes from states all over the West who do not have their own dumps. Federal regulations forbid that closure of official dump sites to interstate traffic, so truckloads of waste that now pass through on their way to California and Nevada would dump here instead, inviting what seems to be inevitable at dump sites—acci-

dent and leaks and exposure of the public and the environment to highly toxic substances.

State officials say that we must have a regulated dump site to prevent illegal dumping of hazardous wastes in the state, but it seems to me that control should begin at the production end of the waste cycle as is required by the *Toxic Substances Control Act* and its state counterparts. If you know what is produced, and have bills of lading showing how much of it goes where, then there shouldn't be much change for illegal dumping.

The costs of production, including health and safety measures, should be borne by the producers and by the consumers they serve, not by the general public. Hazardous waste control should be a function of the licensing of hazardous substances production, the cost covered by the licensing fees. Hazardous wastes should continue to be shipped out of state, the safeguards to public health during transportation covered by transportation taxes. If at some future time out-of-state disposal becomes impossible, production of hazardous substances within Arizona could be curtailed by means of provisions written into the licenses, much as smelters are supposed to cut back production when their toxic smog exceeds certain health standards.

Production is the root of the problem, not disposal, and before we commit ourselves to a toxic substances economy by accommodating measures like state waste dumps, we should be given a choice on whether we want such industries at all, and if so, under what conditions and standard of safety. We certainly should not be spending taxpayer money for the benefit of private industries we may decide we just don't want in the state.

## **Comments on Hazardous Materials before the Arizona Joint Legislative Study Committee (1989)**

Michael Gregory, for the Sierra Club, Grand Canyon Chapter, Phoenix, Arizona (30 November 1989)

Mr. Chairman and members of the Committee, my name is Michael Gregory. Thank you for the opportunity to comment again on the need for a comprehensive hazardous materials management program in the state. In previous comments, I touched on several hazardous waste issues. My comments today build on those earlier points, but focus on four main areas: hazwaste definition, hazwaste incineration, sham recycling, and the Mobile facility.

### ***Hazwaste Identification***

We recommend that the Legislature broaden the state definition to include hazwastes listed by other states. Arizona already relies on EPA, on professional societies, on universities and other authorities for guidance and standards; if another state has already sifted through the raw data, we should take advantage of their labor. If there are materials listed that shouldn't be (like shredded money, maybe), they could be removed fairly easily by a petitioner showing DEQ that they're not hazardous.

That should be the rule in all hazmat regulation: users should have to prove that a waste isn't hazardous rather than the State or the public having to prove that it is.

In addition to the RCRA and non-RCRA wastes, we recommend that the State expand its definition of hazwaste to include "emissions to air, discharges to water, or solid wastes from a production and/or manufacturing process, containing a hazardous substance as listed in 1) the *Superfund Amendments and Reauthorization Act* (and future amendments), Section 313(c) 40 CFR 372.45 (approximately 300 substances); and 2) the CERCLA 40 CFR Section 302.4 list (including approximately one third of the SARA 313 substances and an additional 280 substances (cf. New Jersey Source Reduction and Recycling Task Force *Report*, Jan. 1988).

### ***Toxic Air Emissions***

In order to adequately cover hazwaste incinerators and other facilities that emit toxic air pollutants, we need to strengthen our air quality law. We recommend that from the State list of airborne hazardous wastes, the DEQ be mandated to establish a priority list of toxic air pollutants, including but not limited to a) the 187 hazardous air pollutants listed in H.R. 2585 (the Leland/Molinari "Air Toxics Control Act") being considered by Congress, and b) any other air pollutants the department knows to cause cancer, reproductive effects or other chronic disease.

DEQ should be given authority to require any facility, regardless of permit status, to monitor for priority toxins. Facilities emitting or with the potential to emit 5 tons/year (tpy) of any one of the listed toxins or 15 tpy of any combination, should be required to use Maximum Reduction Technology, and all facilities should have to ensure that their emissions will present no more than a one in a million risk of cancer, birth defects or other genetic disease to exposed individuals.

### ***Incineration***

Hazardous waste incineration seems like a good idea at first. It can reduce volume of solid wastes, provide fuel for energy generation, provide jobs, etc. It looks especially good in light of EPA's ban on hazwaste landfills. But critics point out that incineration only creates a "landfill in the sky."

Critics also note that hazwaste incineration is a relatively new and unproven technology that presents many potential risks, and they cite health studies showing elevated rates of chronic disease in the fallout areas around incinerators.

Incineration generates its own toxic wastes in the form of fly ash, heavy metals, bottom ash, residues, fumes, etc.). In the chemical stew of incinerator emissions, some wastes combine to form compounds that can be even more toxic than the original feed material being burned. Depending on stack temperatures, weather conditions and other factors, incinerator emissions can travel hundreds of miles from their source.

EPA admits [cf. *Inside EPA*, Oct 89] that its current incineration standards are weak, especially on toxic air emissions and on storage, treatment and disposal of incinerator bottom ash, the highly toxic final product of incineration. Ash residue can account for 30-40% by volume of the waste fed into the process and is highly toxic, containing concentrated and trace amounts of many different kinds of heavy metals and organic compounds.

Three components of special concern in the emissions and ashes from incineration are PCBs, dioxins and furans (or, to give them their chemical names, polychlorinated biphenyls, polychlorinated dibenzo-dioxins and polychlorinated dibenzo-furans). Dioxins and furans are both highly toxic, known to cause respiratory, cardiovascular, urinary and nervous system damage. PCBs and some of the dioxins are potent carcinogens. The best-known dioxin, TCDD, is one of the most toxic chemicals known; tests have shown that it can cause birth defects in monkeys in doses as low as 5 ppt. Incinerator fly ash containing PCBs, dioxins and furans is so toxic that any level of emissions is generally considered unacceptable by health authorities and the public.

PCBs, dioxins and furans are generated when many common hazwastes (petroleum products, e.g.) are burned, and they are extremely long-lived. Like heavy metals in the emissions stream, they tend to cling to particulate matter, so they persist in dust and soil. They can enter the body by ingestion, inhalation and absorption. They are more soluble in fats and oils than in water, so they accumulate in the fatty tissue and milk fat. They are so toxic that the only reasonable amount to allow in emissions may be zero.

There are no national air standards for dioxins and furans and no federal program for their control. Since 1986, EPA's rule of thumb for acceptable risk from air toxins around incinerators has been one additional cancer death in every 100,000 ( $1 \times 10^{-5}$ ) people exposed for a lifetime, or about 10 times greater risk than the usual standard for regulated air toxics ( $1 \times 10^{-6}$ ). For benzene, one of the common highly toxic pollutants emitted when petroleum products are burned, EPA has proposed to accept an even higher risk (see NRDC in U.S. Senate, *Sham Recycling*, 14 April 88, p.22; EPA Final Rule, Fed Reg 31 Aug. 1989).

In 1987, EPA proposed the  $1 \times 10^{-5}$  risk as the health standard for resource recovery facilities. EPA proposals on toxics seem to change very rapidly these days so I'm not sure what's current at the moment, but a month or so ago EPA was saying that even if its proposed new tougher standards are adopted, there will still be a high cancer risk around incinerators (*Inside EPA*, Oct 89).

Given the problems, a strong case can be made for not allowing incineration at all. Its main justification as a preferred alternative is that it seems to be a lesser evil compared to landfills. But that assumption may be wrong; since we don't have much monitoring data for air toxics, it's hard to make a risk comparison between dumping on the ground and dumping in the air. When the Legislature decided in 1981 to go for a state incinerator, incineration seemed to be an up and coming technology that would solve more problems than it created. But the technology has not proved itself, and we recommend that the Legislature revisit the whole incineration issue before any more permits are issued for burning hazwastes.

We recommend that the State impose a five-year moratorium on siting of treatment and disposal facilities, including incinerators, so that regulators and the public can fully investigate not only the potential impacts of individual facilities, but the aggregate and cumulative impacts of multiple facilities throughout the state. And so the State has time to develop an effective waste reduction plan. It takes two to three years for a single facility to get permitted; five years is not unreasonable for a study of the entire state.

If and when an incinerator is permitted, it should be only after a "controlled trial burn" on-site has shown that the facility's Best Available Control Technology will achieve compliance with health standards. Other permit requirements for incinerators we recommend be established by statute include:

1. No imported wastes.
2. No generation of wastes for which there is no acceptable, available treatment or disposal method.
3. Restricted to disposal of wastes that are not suitable for recycling or reuse, and have undergone maximum treatment to reduce toxicity.
4. Meaningful public participation in all phases of permitting, beginning with company's first application.
5. Environmental impact study at applicant expense.
6. Background monitoring of all environmental media prior to operations.
7. Continuous emissions monitoring for air toxics at the stacks.
8. Monitoring for and maintaining of water quality standards including heavy metals not covered by the Safe Drinking Water Act.
9. Maximum achievable controls for preventing air and water pollution.
10. Contingency plans that include transport and community hazard analysis.
11. Community veto power.
12. Financial and technical capability, including capability of dealing with post-closure site maintenance, emergencies and environmental contamination.
13. Clean legal record.
14. Frequent announced and unannounced inspections, with stiff civil and criminal penalties for violations (and with a substantial portion of any fines going to the local community).

### ***Recycling, Sham Recycling, and Recovery***

Loopholes in the federal *Resource Conservation and Recovery Act* (RCRA) have made the burning of hazwastes in facilities designed for purposes other than hazwaste incineration a national issue. Because recycling, recovery and energy generation operations are not consistently regulated as hazwaste treatment and disposal facilities, there is a lot of opportunity for facilities that use hazwastes as fuels to call their operations recycling or resource recovery and thereby avoid fees and other regulations that apply to incinerators and other treatment and disposal facilities.

Last year, a Congressional hearing on sham recycling was held (Subcommittee on Hazardous Wastes and Toxic Substances of the Senate Environment and Public Works Committee, 14 April 88) and it covered a lot of ground that we seem to be repaving in Arizona. As Senator Baucus said in opening the hearing, "companies engaged in sham recycling are treating hazardous wastes apparently with only minimal controls of air emissions and residual waste, and "responsible members of the smelting, cement and aggregate kiln industries have expressed concerns about sham recycling" "

The Cyprus-Miami copper smelter seems to fit the profile of a sham recycler. It burns some 17,000 tons of imported hazwastes a year from the electroplating industry for metals recovery, but the company's attorneys have argued that the State has no authority to require monitoring for air toxics from the operation. Cyprus argues that the Miami process is copper recovery rather than hazwaste incineration, and, as we heard at the last Committee meeting, the company does not "burn" hazwastes, but "smelts" them.

Semantics notwithstanding, the hazard posed by burning a hazardous materials is not mitigated by the purpose of the burning. Resource recovery and recycling operations that use hazwastes should have to obtain hazwaste treatment permits for the recycling itself and for disposal, not just for storage. EPA's regulation of sham recycling is weak and based on economics, rather than health protection (cf. U.S. Senate, *Sham Recycling*, 14 April 88, pp. 105-116), so the State should take up the slack.

Recycling and recovery operations should be required to maintain Best Available Control Technology and meet the same health standards as other permitted treatment facilities. The intent of Congress that "protection of human health and the environment [never] be subordinated to the continuation of used oil recycling activities" (*H.R. Rep. No. 98-1133*, 98th Congr., 2nd Sess., at 114 [1984]) applies to other recycling and recovery operations as well. Health standards should not be lowered just because we want to encourage recycling and recovery.

If the facility blends hazardous waste with non-hazardous waste, the resulting mixture should be regulated as hazwaste. If the facility generates wastes, those wastes should be classified as hazardous (cf. RCRA, 40 CFR 261.3 [1987]). If the operation requires high heat, it should have to get an incineration permit whether the heat is for "burning", "smelting", "heating" or whatever. If the facility disposes of hazwastes, it should have to get a disposal permit. If it walks like a duck. . . .

On the other hand, if the site-specific test burn and monitoring indicate that an operation really isn't going to poison people and the environment, that there are no emissions of priority pollutants and other emissions are within standards, and that the smelter slag really is "inert", then the facilities shouldn't have any trouble complying with treatment and disposal regulations. We encourage recycling and recovery, but not at the expense of human health and the environment.

### ***The Mobile Facility***

The purpose of a waste management program should be to minimize wastes and waste imports, not require increases, but the planned Mobile disposal facility will do just the opposite. contractors at the State's hazwaste incinerator in Mobile say they cannot operate the plant profitably without importing hazwaste from out of state. Arizona doesn't generate enough hazwaste to keep its own incinerator cooking.

Arizona has already become a dumping ground for wastes from other states, and the Mobile facility as planned will only make that problem worse. California, for example, presently has only two permitted incinerators and a few thermal recycling facilities; due to stricter regulations in California, most generators of solvent and oil waste in that state will be only too glad to ship it to Mobile (cf. Calif. Dept. Health Services, U.S. Senate, *Sham Recycling*, 14 April 88, p. 18).

Not only is the Mobile plan controversial, it's dangerous: it exposes Arizona people and environment to sharp increases in avoidable and unnecessary risks by putting many times more hazwaste shipments on our roads and through our communities. It's also bad economics. When you factor in costs of treating medical, environmental and legal problems, the benefits don't look so attractive.

The normal hierarchy of alternatives for dealing with hazwastes is to start with source reduction as the preferred alternative, followed in decreasing priority by recycling, reuse and other treatment to reduce hazard. Disposal should be the least preferable alternative, but in the absence of mandatory waste reduction laws, the Mobile facility at least potentially short circuits the normal hierarchy. By making disposal so convenient and so competitively priced, the facility will provide a strong incentive for generators to skip the environmentally preferable alternatives.

To overcome this problem, fees charged at the facility for wastes that have not undergone documented treatment to reduce volume and toxicity should be substantially higher than for pre-treated wastes.

There has been a concern that reasonable disposal fees might encourage illegal dumping. This can be avoided by a better tracking system starting at the front end of the hazmat cycle, and by a fee system modeled on the return deposit principle. Generators of hazwastes would be required to pay handling fees for the use of raw hazardous materials and for wastes at the time of generation. Rather than having to pay when they are ready to get rid of the wastes, they would get part of their earlier payments refunded if they recycle, reuse, or otherwise treat the wastes and if they dispose of them properly.

As with recycling plants, the value of the incinerator can't be figured just from the the fees the operator charges customers. The highest value is supposed to be in the savings in medical and environmental costs that occur without the incinerator. If the State is determined to have the Mobile incinerator, it would do better to run it as a cost-saving function of government, not farm it out with subsidies to a firm dependent on making a profit.

Running the facility with State employees is one possibility. Another might be for the State to get out of the business altogether, and offer the facility for sale. That solution has the advantage of not requiring the State to police itself, as it will have to do under the current "partnership", and the further advantage of putting liability for health and environmental costs solely on the operator rather than the taxpayer.

In either case, the State should not be involved in the business of making a profit by importing hazwaste. No matter who runs the facility, it should have to meet the strictest standards for air, water and health protection and should be restricted to wastes generated in Arizona. Interference with interstate commerce is not an issue if the state imposes restrictions on feedstock source as part of the contract.

With my written comments I'm submitting a list of questions about the planned Mobile facility. The questions are primarily concerned with issues of public and environmental health. They are not so much about the ENSCO operation in particular as about operations at the site in general.

Rather than raise more questions about ENSCO's environmental record, I offer the comment that even though all the incidents and charges may be explained away individually, the fact that there is so much explaining necessary doesn't exactly inspire confidence.

And confidence is a major issue. The public has very little confidence not only in ENSCO, but in all aspects of the hazwaste business: there is no confidence that burning wastes doesn't poison the air; no confidence that landfill liners won't leak and that the water won't be contaminated; no confidence that waste dumps and spills can ever be cleaned up satisfactorily; no confidence that government can or will provide adequate protection. From the federal and international levels to individual backyards, the whole hazwaste business is widely regarded as a scam.

In closing, I'd like to point out that the questions we are asking are the kind that would be answered as a matter of course if we had a State Environmental Policy Act. Since we don't have one, we have to try to make do with our existing permit system, which is generally conceded to be uncoordinated, clumsy and full of loopholes. In the upcoming session, the Legislature could restore some of the public's confidence by tightening up existing regulation in at least the following seven areas: 1) narrow definitions of hazardous waste; 2) weak control of toxic air emissions; 3) weak standards for recycling, sham recycling and recovery operations; 4) unenforceable waste minimization program; 5) import-promotion policy; 6) permitting of excessively large unneeded disposal capacity; and 7) environmental impact study of the state's hazwaste management options, including an updated impact analysis of the proposed Mobile facility.

### ***Questions about the Planned Hazwaste Disposal Facility in Mobile***

- *Health and Safety Issues*

1. What health studies have been done to show the potential impacts of the operation? How good are the studies? What risks do they show to health and environment?
2. How many people are in the vulnerability zone (the area potentially at risk) around the site?
3. How many people are in the vulnerability zones along the transport routes to the site?
4. What substances will be fed into the incinerator? In what quantities, forms and concentrations? How toxic are they? How much of the feedstock will be pre-treated to reduce toxicity before it is shipped to the facility for disposal?
5. With what frequencies will wastes be transported to the facility? In what vehicles/containers? By what routes? Through what communities?
6. What toxics will be released through stacks, fugitive areas, ash, etc? In what quantities/concentrations?
7. What state, federal and county air emissions standards/limits will the facility have to meet? Are these health-based limits, or based on economics?
8. Will the facility close down if emissions exceeded health protection levels? How quickly?
9. What happens if the system malfunctions? What is the chance of that? How quickly can an accidental release be controlled? What is the worst-case scenario?

10. What emergency response procedures will be followed in case of an accidental release? How far could lethal doses travel from the facility under typical weather conditions? Under extraordinary conditions?

- *Environmental Issues*

1. How much water will the facility use? Where will it come from? How much will be consumed (i.e., lost to evaporation, etc.)?

2. How much water will be contaminated in use? With what? To what extent? Where will it be discharged?

3. What sensitive or listed habitats/species (rivers, parks, refuges, eagle nesting sites, wilderness areas, etc.) are in the vulnerability zones around the facility and its supply routes? What will be done to mitigate potential impacts on them?

4. How will soils be monitored?

5. Does the 1983 Environmental Impact Statement (EIS) accurately describe the facility being planned today? How does the data on kinds of wastes and percentage of imports compare? How do the figures on amounts of waste generated in Arizona compare?

6. How long will the landfill site be toxic? How do current plans for the landfill compare to the EIS data?

7. If the facility contaminates the groundwater, how will it restore the aquifer to pristine condition? How long will it take?

- *Import Issues*

1. The 1983 Draft Environmental Impact Study indicated that approximately 15% of the wastes handled at the facility would be imports. Why is the facility now being planned to handle 70% imports, 3-5 times more waste than Arizona generates?

2. Where will the imports come from?

3. How much hazwaste will the company be bringing from its own operations in other states? What kind? Which states?

4. How will the company be charged for its own wastes from its own facilities in other states in comparison to charges for other imports and for wastes generated in-state?

- *Procedural Issues*

1. When will the company obtain an Aquifer Protection Permit to replace its less stringent Groundwater Protection Permit? Will the RCRA permit require compliance with Aquifer Protection Standards?

2. How long are the various permits and contracts good for? What happens when they expire?

3. What will the company's liability be for problems that don't show up until after the 30-year

post-closure period?

4. What county permits must the company obtain? Are county environmental protection requirements less or more stringent than the state's, or the same?

5. What kind of financial capability has the company had to show? What kind of financial rating does the company have? Does the company have assets sufficient to cover the complete costs of recovery and clean up?

6. What annual net profits does the company project?

- *Technical Issues*

1. What kind/model incinerator(s) will be used? Is this the same equipment considered in the 1983 EIS? Is it the best technology available to assure no migration of toxics from the site and no adverse health and environmental effects? If not, why not?

2. Will the company be required to meet minimum performance standards? If so, what are they? If not, why not?

3. How will the bottom ash, residues, etc. be handled? What percentage of the feedstock will end up as ash? What percentage will be stabilized before landfill?

4. How will windborne dispersion of ash and other residues be prevented?

5. Will the planned technology prevent emissions of top-priority wastes and keep other emissions below health effect levels?

6. Will emissions, discharges and other releases be monitored continuously? If not, why not?

7. How will the flue gases be monitored? How often?

8. How much fly ash will be captured? How much will not be? What size particles will be emitted?

9. How often will monitoring equipment be calibrated?

10. Will the facility include recycling operations or other treatments to minimize wastes needing disposal? If not, why not?

## **The Arizona Hazardous Waste Management Facility: Public Concerns (1990)**

Michael Gregory, for the Sierra Club Grand Canyon Chapter, before the Commission on Arizona Environment Conference on "Hazardous Waste Management: The Basics, The Issues, and the Controversy," Rio Rico, Arizona (8 August 1990)

It is good to be back before the Commission. You will recall that when I spoke to you at the Phoenix meeting last year I said that hazardous materials management, including hazardous wastes, would be a major legislative issue in the last session. Unfortunately, because the Legislature failed to act, it is going to be a major issue this coming fall, during elections and during the session.

The failure of the Legislature was a great disappointment, because the votes were there to stop imports to the Mobile facility and to address some of the other waste issues, but the Republican leadership refused to let the bill come to the floor for a vote.

Before getting into the specific topic, let me begin by clearing up some confusions about the Sierra Club. The Sierra Club is a 100-year old grassroots organization with some 8000 members in Arizona, a number that grows every day. Sierra Club policies are decided from the ground up based on actions of volunteers.

Despite what you may have heard, like other Club leaders in Arizona, I am a volunteer, and have been acting as Conservation Chairman for the state since 1985. I am not now and never have been paid for the work I do for the Club. There is only one paid employee for the Club in Arizona: that is the Assistant Southwest Representative, and his work is confined almost entirely to national issues; state issues are handled by the state chapter through its member-elected Executive Committee.

As for its involvement with hazardous waste issues, nationally, the Club played a major role in passage of RCRA and its amendments, and will play a major role in the upcoming reauthorization of the law, pushing for amendments to fill in some of the gaps and loopholes. For instance, we will be working to change the EPA policy that keeps pesticide-contaminated sites like the Gila River from being cleaned up under CERCLA.

### ***ADEQ Chronology***

I'd like to begin my comments on the Mobile facility by adding a few points to the ADEQ "Chronology" that was on the handout table.

*1981-1983* For instance, I would like to see added to the years 1981-1983 the ADHS Technical Advisory Committee that was formed to look into a number of issues about the proposed facility. Roger Caldwell was chairman of that group and Alex Dely of the Sierra Club was a member. Unfortunately, the group was never consulted on any issue except siting, and its recommendation for siting was not followed by the Legislature, which chose the Mobile site (with a 500' depth to groundwater) instead of the Advisory Committee's preferred location in the Harquahala Valley (with a depth to groundwater of about 1500'), where contamination would have taken about 10 times as long to reach the water table.

Once the Technical Committee made its recommendation on siting, it did not meet again for almost a year (October 1982-August 1983) and was finally disbanded.

*October 1982* Another point I'd like added to the "Chronology" is that the RFP of October 1982 called for a facility that would achieve "maximum resource recovery," (i.e., recycling) and would require pre-delivery waste minimization. It should also be noted that the RFP did not mention imports or incineration.

*February 1983* Again, the February 1983 DEIS envisioned a facility that would be based on Arizona wastes, and contemplated imports on only 2 pages (C-5, C-6) of Appendix C of the 400+ page document. On those pages it says that "one recent study suggests that approximately 15 percent of the total annual waste quantity likely to be transported to the Arizona facility could come from New Mexico, Colorado, or western Texas." The DEIS goes on to say that "Out-of-state wastes were not included in the analyses presented in this EIS [because] Arizona is planning the facility based on its in-state waste stream data, and has used this data in developing its Request for Proposals (RFP) from potential facility contractors . . . [and] given the complexities and the large number of variables involved, it is not practical to make a realistic estimate of the waste types and quantities which could be sent to the facility from outside Arizona."

*Also in February 1983*, the ENSCO bid was received, and that be-came the basis for the state's decision to go for incineration in the July 1983 Final EIS. This is significant because the Draft EIS is the only one the public had an opportunity to comment on without going through appeal or court action. The Final EIS, now being contested in federal court because it is so different from the Draft, did not analyze the impacts of the incinerator facility it now proposed, nor of the projected 10-12 MTPY of PCB imports (amounting to a 10-fold increase in the amount of waste considered in the DEIS), but said that the permits for the facility would make such analyses, and would be the "functional equivalent" of an EIS.

This assertion of "functional equivalence" is also being contested in court, on the grounds that the facility permits do not contain many of the basic elements of a NEPA-required EIS, including consideration of alternatives (most notably a no-action alternative) and full public participation.

*July 1983* Another point to be added to the "Chronology" for July 1983 would be the fact that the Oral Review Board recommendation that the ENSCO rather than the BKK bid be approved, explicitly recognized not only that importing waste would be cause for great public controversy but made its recommendation contingent upon development of "comprehensive and detailed state and federal permit applications. . . reviewed by the interested public." This, of course, has not been done, and is part of the reason that we now have so much of that controversy the Committee predicted.

### ***Response to Previous Speakers***

I would like to make some response to statements by previous speakers this morning. First, in response to Ed Fox's remarks, I'd just like to note that ignorance of the law or of the potential effects of actions are no excuse: if companies don't know what they're doing to people and the environment, they shouldn't be doing it.

Second, I's like to make four points in response to T.J. Harri-son's statements. (1) First, as he said, it's too bad that we didn't have an environmentalist lawyer on that panel, because we would have heard a far different interpretation of the issues. (2) Second, contrary to what T.J. said, ADEQ is *not* requiring ENSCO to get an Aquifer Protection Permit (APP). I agree that they are legally bound to get one, but ADEQ has only required a Groundwater Protection Permit so far, and has set no deadline for the company to get an APP as required by the 1986 law. The depart-

ment maintains that getting an APP is not a priority because a RCRA permit is a stronger protection than an APP.

(3) Third, the state and federal governments are liable to citizen suit if they *don't* consider *psychological* and *sociological* costs of proposed actions—you cannot legally ignore the legitimate concerns of citizens even if they are hard to quantify in traditional elitist, technocratic terms.

(4) And fourth, federal laws and regulations do not require Arizona to permit more disposal capacity than it needs for its own waste.

### ***Permit Issues***

In the few minutes I have left, I'd like to just list some of the concerns the public has about this facility. These are, for the most part, technical concerns. Some of them, and some others, especially those relating to the permitting process, are noted in the Sierra Club handout I hope you have picked up from the table outside. In regard to all of these concerns, it should be noted that because federal RCRA and TSCA rules are quite weak, in order to really protect health and the environment, the state should go well beyond minimum federal requirements.

- Inadequate public participation (including poor distribution of the Administrative Record and background documents, which still are not out there for public scrutiny despite the Governor's assurance over a month ago that the documents would be available by July 5th in all the public repositories around the state.

- Phony risk assessments, developed with pre-conceived outcomes and achieved through unacceptable methods like raising the height of the stacks from 40' to 125'.

- Inadequate characterization of emissions (even EPA says that only 40% or less of the unburned hydrocarbons that come out of the stacks have been identified at any particular facility and that "thus, the bulk of the hydrocarbon emissions have not been considered in those risk assessments" (55 FR 82: 17868).

- Inadequate monitoring requirements, e.g., (a) only one ambient monitor, (b) only one one-time test for TCDD-dioxin, and (c) no regular monitoring for dioxin or other semi-volatile organic compounds, (d) no in-stack, continuous monitoring for carcinogens (including heavy metals), (e) no testing of residues in the foodchain or soils (wildlife, vegetation, livestock tissue and milk, etc.). Monitoring is necessary as a means of validating computer exposure models.

- Inadequate emissions limits (e.g., nothing for dioxin, too high for heavy metals, etc.).

- No consideration of alternatives.

- Inadequate pre-delivery requirements (requires only weak EPA manifest certification that generator has considered economic feasibility of reduction treatments instead of requiring *maximum* reduction in toxicity and volume before coming to the facility).

- Inadequate inspection and enforcement (as we have seen with the utter lack of state inspection of the construction already done).

- Reliance on destruction efficiency during a pre-operation "test burn" rather than health-based clean air standards at all times. The state should set toxics emissions standards before

permitting the facility.

- Failure to require best technology (e.g., should require—as EPA does of Municipal Waste Incinerators—that flue gas temperatures be limited to 450° at the inlet to the Air Pollution Control Device in order to limit creation of SVOCs like dioxins and furans, which are formed in temperatures of 480-750 in dust layers of baghouses and Electrostatic Precipitators). Another example: EPA says the technology is available to control dust to 0.01-0.02 gr/dscf, but the draft permit would allow ENSCO to emit 0.08 gr/dscf).

- Too much discretion for ENSCO on what wastes can be accepted (e.g., if a shipment arrives that does not match the manifest, ENSCO has discretion to accept the shipment and burn it anyway).

- Inadequate emergency response procedures.

- Inadequate post-closure requirements (including watchdogging the site for only 30 years, when it is known that some impacts are not likely to show up for 100 or more years).

- Etc.

### ***What Should Be Done?***

In addition to those points made in the Sierra Club handout (Attachment A), we suggest the following, many of which will require changes in state and federal laws and regulations.

- *Imports* Ban them to the state facility: the facility should be for Arizona-generated wastes only (and this in no way contravenes the Constitutional commerce clause).

- *Capacity* Permit in Arizona only the disposal capacity needed for Arizona wastes.

- *Incineration* Prohibit it unless it can guarantee 100% reduction to non-toxic emissions and residues.

- *Definitions* Expand the state's definition of hazardous waste to include whatever is defined as hazardous or toxic in other states or Puerto Rico (which currently exports wastes to Arizona), in short, whatever wastes are "dangerous" (as ENSCO says in its ads).

- *Source reduction* Require (a) mandatory toxics use reduction as do other states (Massachusetts, Oregon, Indiana, e.g.), (b) cradle-to-grave fees, and (c) maximum waste minimization before disposal.

- *Emergency planning and response* Require funding for Local Emergency Planning Committees and local emergency response teams.

- *Environmental Impact Analysis* Require environmental impact studies of all actions undertaken or funded by the state.

- *Toxic air emissions* Require strict state and federal limits on and monitoring of toxic air emissions (almost all of which are currently unregulated).

- *Public participation* Require pre-permit participation of the public in the siting of any proposed facility; the public should have not only the Right-to-Know, but the Right-to-Say-

No.

- *Stiff penalties* for violations (rather than the current tap on the wrist).

In closing, I'd just like to note, as you've heard me say before, *no* additional risk is acceptable if it is (1) avoidable, (2) unnecessary, and (3) not wanted by the people. All three of these conditions apply to the proposed Mobile facility.

## **On the Governor's Hazardous Waste Technical Advisory Committee Report (1990)**

Michael Gregory, before the Arizona State Legislature Joint Legislative Committee on Hazardous Wastes, Phoenix, Arizona (5 October 1990)

The is a technical document and reads like one. Although the Committee tried to make the Report as accessible as possible to the general public, by its very nature it contains terms and concepts that are difficult for the general reader and, ultimately, it is a committee product, with all the weakness that committee constructions are heir to.

In addition, the Committee had to work under severe time constraints of time (less than six weeks from start to finish) and limits in scope. Although the Governor's Order directed the Committee to "review . . . and develop recommendations on the appropriate role, scope, science and technology for the State site," the Committee was repeatedly told that we were not to comment on the draft permits for the facility at the site. We were also asked not to get involved with the waste import issue. The permit conditions and imports, we were told, were *policy* issues, not *technical* issues, and therefore beyond the purview of the Committee.

It is, of course, impossible to study the hazardous waste situation of the state without considering the importation issue, and equally impossible to make recommendations on the "role, scope, science and technology for the State site" without considering the permit conditions proposed for the facility under construction there.

In addition to these relatively contradictory assignments and the time and size constraints, the Committee almost totally ignored asbestos, medwastes, minewastes, petroleum wastes and other waste streams that are hazardous without the official name.

Nonetheless, there is a great deal of value in the Report, and although we disagree with some of the exclusions and a few of the conclusions, we agree with the general recommendations and strongly support many of the specific findings, conclusions and recommendations.

### ***Incineration***

The Committee deliberately did not take a stand one way or the other on the issue of incineration at the State site, but instead presented a good deal of technical data on the subject so readers could draw their own conclusions.

The fairly obvious conclusion to be drawn is that there is just not enough incinerable waste generated in Arizona to justify an incinerator at Mobile. That is the position of the Sierra Club and other environmental organizations, and we find ample support for it in the Committee Report.

Specifically, although we disagree with the Report's conclusion that "incineration could be useful in Arizona" (p.25), we do agree with the conclusion that incineration is the currently appropriate technology for some wastes, especially some organic wastes (pp. 24, 25); and we agree that "where both chlorine and hydrocarbons are present, dioxin and furan emissions may occur from incinerators" (p.25). We further agree that "incineration does not destroy toxic metals in hazardous waste" (p.25); that "incinerator emissions of toxic metals, especially arsenic and mercury, are difficult to control" (p.25); and that "if problems such as excessive PIC production or heavy metals releases are confirmed, new technologies should be investigated and implemented to solve these problems" (p. 42).

Furthermore, we agree that Arizona generates only about 1700 tons per year (tpy) of wastes suitable for incineration (p. 18); that the State has not developed data to show how much of that incinerable waste or any other kinds of waste might be reduced by pollution prevention and source reduction strategies, and we agree that such methods ought to be applied to the total universe of wastes in the state (pp.52-53, 68). And finally, in light of the capacity of the ENSCO incinerators [150,000 ton/year according to an ENSCO representative as quoted the other day in the *Arizona Daily Star*, but evidently closer to 50,000, or about 25 times what Arizona produces], we emphatically agree with the Report that "the current emphasis on development [of] incineration capacity is inconsistent with current and projected quantities of incinerable waste generated in the State" (p.18).

### ***Pollution Prevention***

The heart of the Committee's Report is the recommendation that the State implement a broad-based pollution prevention program to eliminate or reduce hazardous waste at the source. As the Report says, "if you don't produce it you won't have to transport, store or destroy it."

The Report documents that several other states have already passed strict toxic-use reduction and source reduction laws, and recommends that Arizona fortify its current anemic, voluntary, unfunded waste minimization program with elements from the best reduction programs in other states, including mandatory reporting on generation and reduction, enhanced research, a toxics rating system for consumer goods, technical assistance to small generators, and adequate funding.

### ***Waste Stream Characterization***

Pollution prevention and source reduction programs are primarily industry-specific strategies that eliminate the need to ship waste off-site to treatment/disposal facilities. This on-site reduction concept is especially significant in light of the Committee's findings about how much and what kinds of hazardous waste is generated in Arizona, and by whom.

Not only did the Committee find that the State facility is being overbuilt for (incinerable) wastes that Arizona does not produce (p. 18), but that it is under-designed for the kinds of wastes that we do produce (pp. 14-15, 18). While incinerable wastes make up only 5% of Arizona's waste stream, about 89% of the wastes generated in Arizona (pp. 13-15) now and expected to be generated during the next 25 years "are aqueous inorganic materials generated by primary and fabricated metals industries and by electrical and electronic industries" (p.13). Yet, according to ADEQ's "Capacity Assurance Plan" issued earlier this year, within 20 years the State will not have adequate disposal capacity for those non-incinerable inorganic wastes, even if the State facility is built as proposed.

This is why the Report recommends that "minimum capacity and treatment alternatives at the State facility should be based on amounts and types of waste streams generated in Arizona" (p.64) and that the facility "should be adequate to handle the appropriate hazardous waste types and volumes generated within Arizona" (p.70).

The Report also finds that almost all of Arizona's industrial hazardous waste is produced by a very small number of facilities. One-third of the wastes sent off-site for treatment and disposal are generated by just four companies. Another third are generated by just another eleven. Twenty more firms produce another 20% (p.13). In other words, just 35 facilities generate 85% of the waste being sent off-site for treatment and disposal. This is the waste that would,

presumably, go to the State facility, and it is for the most part not incinerable waste.

In light of this remarkably small number of generators, two questions must be asked: (1) Why are we building a multi-million dollar facility to handle the wastes of a handful of companies? and (2) Why don't we just require them to practice pollution prevention and take care of their own wastes?

### ***Transportation***

The Report finds that the risks of hazardous waste transportation in the state have not been adequately assessed (p. 57); that "the in-flow of hazardous waste from out-of-state will increase the risks associated with hazardous wastes on the highways" (p. 57). Furthermore, the Report notes that the 1987 risk assessments prepared for the Department of Health Services and submitted as part of the ENSCO application (Appendix J-1.2) apparently considers less than 5% of the area potentially at risk from shipments to the State facility, and doesn't figure in out-of-state shipments, and thereby seriously underestimates the probability of hazardous waste releases on roads and highways (p.57).

The Report makes several recommendations (pp. 57-58) on transportation issues, which we strongly support, including the following:

- The State should periodically update a risk assessment of hazardous waste transportation.
- The State should consider setting up a computer tracking system for hazwaste transportation, including available technologies like real-time satellite monitoring.
- Dedicated routes for the transportation of hazardous wastes should be established as an aid in emergency response to accidents.
- The State should implement a safety inspection and driver qualification program for hazardous waste drivers, vehicles and equipment.
- The State should support development of vehicles designed to reduce accident rates and lower the chance of releases when hazardous waste accidents do occur.

In recognition of the inadequate capabilities of emergency services and emergency medical services throughout the state and in particular in the area of the proposed State facility, the Report also recommends that the facility operator provide training, equipment, mutual aid and other support to local fire, police and emergency medical groups to ensure adequate response to transportation emergencies.

### ***Design, Operations and Performance Standards***

The Report makes recommendations on performance standards applicable to any hazardous waste treatment or disposal facility that might be built in Arizona. The Committee found that in some cases technology is available that is more protective of the public health and environment than existing minimum legal requirements or requirements stated in the draft permits. Consequently, the Report recommends that state-of-the-art be required for all equipment, construction and operations (p.70), including (a) pre-treatment quality control analysis of all waste delivered to the facility, especially waste containing toxic metals (p.64), and (b) "redundant systems of oxygen monitoring/interlock devices. . .designed to ensure complete

combustion within each incinerator" (p.70) and thereby to minimize or eliminate toxic emissions.

The Committee was particularly concerned about the lack of monitoring required by EPA and the lack of specificity in State monitoring requirements in the draft permits. For many pollutants, the State and Federal permits would require no monitoring at all, for some would not require even identification, and for others would require that monitoring would be done only once, during the initial "trial burn" when the incinerator first goes on line. The Report makes several recommendations for improved monitoring of air, soil, water and biological resources (food chain) for any incinerator that might be permitted, including

- "Air quality monitoring equipment . . . capable of validating that stack emissions from the incinerators are effectively limited to the level of emissions which were achieved during the required trial burn" (p. 71)
- "An air quality monitoring network and program. . .which allow a complete characterization of all air toxics and criteria air pollutants which may be emitted" (p.64)
- Monitoring of "soil deposition of PCBs and dioxin/furans (p.64)
- Groundwater quality monitoring [for the complete] list of 126 priority pollutants as defined in the *Clean Water Act*.

In discussing kinds of treatment currently available for hazardous waste, the Report draws two further significant conclusions that should be considered when deciding whether or not there should be a centralized State facility and, if so, what kind it should be. First, the Report notes that "even when properly constructed and managed, landfill liners will leak" (p.31), and that "the hazardous characteristics of the waste are often not significantly reduced [by solidification] and the risk of leachate production is not precluded" (p.32).

In closing, I would like to note, as the Report does, that all of these conclusions and findings point overwhelmingly to the conclusion that the State should implement a comprehensive pollution prevention program as soon as possible. Source reduction, not incineration, is the answer to Arizona's hazardous waste problem.

## **On the Draft Permits for the Proposed Arizona Hazardous Waste Management Facility (1990)**

Michael Gregory, for the Sierra Club Grand Canyon Chapter, presented to the Arizona Department of Environmental Quality (31 October 1990)

Dear Mr. Weiss:

Attached you will find further comments of the Grand Canyon Chapter of the Sierra Club on the draft permits for the proposed Arizona Hazardous Waste Management Facility. These comments are in addition to previous comments submitted orally and in writing on behalf of the Sierra Club. These comments also incorporate by reference my comments (also attached) made to the Commission on Arizona Environment (8 August 1990), the Arizona Public Health Association (12 September 1990), the Joint Legislative Study Committee on Hazardous Waste (5 October 1990), and the Society of Prospective Medicine (20 October 1990).

Please note that the Sierra Club strongly opposes issuance of any of the draft permits for the facility as proposed. After investigating the situation and studying the proposal for over a year, we are convinced that there is no need for the kind of facility being proposed, that the site chosen is inappropriate, and that proceeding with the project will expose the people and environment of Arizona to unnecessary, avoidable, and unacceptable risks.

We recommend that instead of proceeding with the proposed facility, the State establish a comprehensive hazardous materials management program, including strong pollution prevention, source reduction and waste minimization components, emphasizing mandatory maximum on-site treatments by generators; then re-evaluate the State's needs for a centralized facility and proceed accordingly in a way that provides maximum protection to human health and the environment.

There are and have been so many things wrong with the State's proposal that it is difficult to know how to comment on them. There are serious problems in the process, seriously flawed data, faulty assumptions, skewed calculations, and in some ways the whole concept is wrongheaded.

### ***Public Participation/Permit Irregularities***

This commentator has spent hundreds of hours reviewing the permits and, despite two extensions of comment deadline, still has not been able to wade through all the details. The system is clearly impossible for the average citizen, who would have to devote several months of her or his life to this proposal in order to make meaningful comments.

In addition, public comment on these permits has been made practically impossible because the permits have been a moving target. There are many examples of this, beginning with differences between the no-incinerator facility considered in the DEIS, the "representative design" incinerator considered in the 1983 EIS, and the MWP 2000 incinerator now being proposed. As late as September 8, 1989, the incinerators were being described by ENSCO and ADEQ as being permitted for 35 MM BTU/hr; but lately the figure is said to be 50 MM.

Other deficiencies and irregularities include:

- The FEIS and contract do not conform to the RFP and DEIS

- The contract was written without public input/review
- In 1989, the state extended its contract with the contractor for an additional five years, although the existing five year contract was not yet up for renewal.
- *Public Education* According to the contract the State has signed with ENSCO, the company is supposed to have developed a public education program; this has not been done. Instead, the company has spent thousands of dollars trying to persuade the public that it's standards are too high and that the company should be allowed to proceed with its plans.
- *Functional Equivalence* The EPA and ADEQ have asserted that the RCRA permit process is the "functional equivalent" of an environmental impact study required under NEPA. The process for this permit has definitely not been the functional equivalent of an EIS or NEPA process. There has been no consideration of alternatives, the public has had to struggle to find information that would have been routinely disclosed under NEPA, the permit process allows public input only on technical issues (not environmental impacts), no worst-case analysis/scenario has been presented, etc.
- *Document Inaccessibility* According to 40 CFR 124, the "administrative record" for RCRA permits includes, at a minimum, (1) the application and support documents, (2) the draft permit, (3) the applicant Fact Sheet, (4) all documents cited in the Fact Sheet, and (5) other documents in the supporting file for the draft permit. As repeatedly stated in our previous correspondence on this subject with ADEQ, EPA and the Governor, the public has not been given adequate access to relevant permit documents, including the "exposure information" of the 15-volume RCRA-B application.

Despite assurances by the Governor on June 6, 1990 that the documents would be made available throughout the state, and the assurance by ADEQ in the public notice that the comment period was being extended through July 5, 1990, that "the administrative record for the draft permit, including all data submitted by the applicant," would be available for public inspection at several repositories throughout the state, the public has not had reasonable access to the relevant documents. Since the public notice earlier refers to permits, plural, it is not clear exactly what permit (singular) is referred to; but, in any case, "all data submitted by the applicant" in support of any of the four permits in question was not then available in the repositories and has not been available at any time since, except for the single repository at the ADEQ office in Phoenix.

In addition, there have been a great many other irregularities in the public participation process. The list includes (a) unwarranted use of police force to disrupt public comment at the May 7, 1990 public hearing in Mobile; (b) improper notification (leading to extension of comment deadline 90 days past original deadline); (c) improper, unpermitted construction at the facility site in obvious anticipation of permit approval, even though public comment on the draft permit had not been completed, indicating a "done deal" between the contractor and state, and making a sham of the whole public participation process.

The following comments are applicable only if, despite our objection, the Department proceeds with the project.

### ***Data Management***

The proposed AHWMF will generate huge amounts of data which ADEQ is presently unable to assimilate or evaluate. Therefore, the permit should require the operator to provide the State

with sufficient computer capacity and trained operators to process the data generated.

### ***Risk assessment***

Risk assessments for this document are incomplete, fraught with miscalculations and deliberately misleading figures. Risk assessment even when done well is full of uncertainties and opportunities for abuse, and is an inadequate guide for regulatory decision-making. For instance, the incinerator risk assessments are based on purported DREs for ENSCO's incinerators, but, as the EPA's Science Advisory Board has said, "the concept of destruction efficiency. . . does not completely address the problem of what is emitted from the stack and does not, therefore, constitute a reliable basis for developing exposure assessments." Even if DRE's were an acceptable basis for risk assessment, the assessments for this permits are not even done well. They are clearly a case of trying to protect the proposed project rather than the environment.

The inhalation risk estimates for accidental releases, for instance, improperly "incorporate probability factors of occurrence into the calculations, thereby lowering the overall risks considerably compared to the risks that would actually occur if a significant accident involving a PCB fire were actually to occur (EPA memo on file at ADEQ, 1 May 1990).

The submitted risk assessments also inaccurately calculate that probability of fires and spills occurring at the facility are negligible (GHWTAC Report, 63).

Similarly, the risk assessment for transportation underestimates risk from transport to the facility by limiting scope of the assessment to a small geographical area and small number of routes (see GHWTAC Report, 57).

According to EPA memos in ADEQ's files (e.g., 12 Jan. 1990), "ENSCO has specific incinerator trial burn data of <20% of the organic carcinogens listed [in the PCB risk assessment]. These represent nearly of the entire cancer risk [and] this represents a large source of uncertainty in the risk assessment for the facility."

If risk assessment is done at all, the risks should be figured in terms of total aggregate, additive, cumulative and synergistic risks from all pathways, not risk of individual chemicals for just the inhalation pathway. The risk assessments that the draft permits are based on do not consider additive effects; as stated in an another EPA memo in ADEQ's files (4 May 1990), "individual emission limits in the AZ permit are established assuming only one carcinogenic metal is being emitted."

If risk assessments are done, they should be based on EPA potency factors or factors that are even more protective, and the maximum permitted risk should be  $10^{-7}$  for all carcinogens, teratogens, mutagens and other genetic toxins in general, and  $10^{-7}$  for heavy metals and class A and class B carcinogens. The proposed  $10^{-6}$  limit considers "only direct exposure to the metals via in-halation of dispersed emissions" (55 FR 82: 17874); a  $10^{-7}$  limit would take all pathways into account, and would provide a margin of safety to compensate for the uncertainties in the dispersion and risk models due to thermal uplifts and the proximity of high population only 20-50 miles from the site. Setting these more conservative risk limits would be consistent with EPA protocol, which calls for setting of risk on a site specific basis (55 FR 82: 17874).

### ***Performance Standards***

In light of the high public concern about this facility, a concern noted by the State when the project was first hatched in 1981, if the facility is to be built (and, as we have recommended

above, it should not be), instead of being based on DRE and risk assessment, it should be a model of the very best that can be done. The permits should require best achievable performance standards based on the best available technology and procedures. The technology is available to routinely achieve far more protective controls than required by EPA's DRE technology standard and better than required by the State's proposed  $10^{-6}$  (or EPA's proposed weaker) risk standard. The goal of RCRA is non-migration of pollutants, and this facility should come as close as possible to non-polluting, zero discharge conditions. The draft permits require little more than legal minimums, and these are not acceptable.

### ***No Imports***

Low-risk operations are clearly contrary to the concept of high imports. Out-of-state wastes, including toxic wastes defined by TSCA, substances classified as hazardous waste by other states and territories, and other non-RCRA wastes, should be prohibited at the facility. If a private business cannot operate the facility under these conditions, then the State should run the facility, preferably through the ADOA. If ADEQ runs it, oversight must be provided by EPA to avoid conflict of interest.

### ***Capacity***

The permit does not clearly limit the amounts of waste that will be stored or processed at the facility. Strict limits on "pre-treatment capacity" of the facility should be required; otherwise the storage capacities of the neutralization and other treatment areas, and of imports, is unlimited.

### ***Waste Characterization***

Since there is no exact characterization of fugitive and stack emissions possible for incineration, all the risk assessments and emissions limits depend on accurate characterization of the feedstocks, yet the draft permit does not require assurance that feedstock characterization of waste delivered to the facility are accurate. The difficulty of accurate characterization would be even greater if out-of-state wastes were to be accepted at the facility. In order to assure that emissions from the incinerators and the substances delivered to the landfills are identified as completely as possible, the permit should :

- Require the contractor to set down in detail how characterization will be used to determine whether a shipment is accepted or rejected.
- Require complete characterization of every wastestream during preshipment evaluation.
- As recommended by the Hazardous Waste Technical Advisory Committee Report (GHWTAC, 64), "a comprehensive laboratory screening process should be in place to verify the profile of every incoming waste shipment. The screening process should include a special round of sampling for the several heavy metals, environmentally persistent organic chemicals, and other substances of concern."
- In addition, frequent calibration of all testing and sampling equipment should be required and the permit should include a system for regular verification through blind control group testing.
- Even if characterization is done properly, the draft permit would allow unacceptable discretion to the operator for how to handle the waste. For instance, if a waste delivered for

disposal does not match the description or advance sample sent by the generator, the draft permit would allow the operator to incinerate the shipment on-site (RCRA, p.30). The permits should specify that wastes which do not match the manifest will not be accepted at the facility.

- The draft permit would also give the Director of ADEQ undue discretion to allow the contractor to accept other wastes than those specified in the original permit (RCRA pp. 34,81). This decision should not be left up to the Director, but a public hearing should be required before each such proposed change in allowable waste.

- Wastes that contain only inorganic substances or high percentages of inorganic substances should not be accepted for incineration. Mixed inorganic and organic wastes that are not appropriate for incineration should be treated to remove the organic components for incineration.

- No wastes should be accepted for incineration unless the contractor and State have shown that incineration of the wastes will not result in an unacceptable net environmental loading of heavy metals and other toxics in the environment.

### ***Source Reduction and Minimization***

The RFP called for pre-delivery waste minimization program; but this is not being required by draft permits. Rather than requiring just the "feasible" reduction certified on the manifest, the permits should require that the "Waste Material Data Sheet" (Hazardous Waste Analysis Plan, Figure C-1) contain certification that waste being delivered to the facility has undergone maximum achievable reduction in volume and toxicity. Waste that has not undergone such reduction should either be rejected or charged substantially higher fees to cover costs of treatment at the facility.

### ***Air Emissions***

- *Trial Burn* There were several deficiencies in the EPA-required trial burns for the ENSCO incinerator type which should be corrected in the trial burns required by the State. For instance, continuous monitoring was not required for THCs, did not include representative sampling, may have used contaminated PCB feeds, and considered only three feedstock compositions. In addition, the ENSCO incinerators "failed" the tests in several ways, including failure to achieve minimum PCB emissions even from tests in which feedrates were only about 1/3 of the designated rate.

The State permit should correct all deficiencies in the federal trial burn tests, including a requirement for continuous THC monitoring since there is no possibility of accurately portraying emissions without THC data.

The Installation Permit should specify that test burns will be conducted on-site at the start of the shake-down period and following each major modification to the equipment, and monitored each time to validate computer estimates of all emissions.

- *Monitoring* The draft permit does not require an adequate number of monitors and does not require that monitors be placed so as to adequately validate computer models of pollution dispersion. This is especially important because the ICS model used generally underestimates deposition. Monitors should be required in-stack and at several strategic locations throughout the windrose inside and outside the facility boundary to adequately register emissions under real time meteorological conditions.

The draft permit improperly limits monitoring of many emissions of concern to the trial burn and shakedown periods. Best available monitoring technology should be required during all phases of operation (from trial through closure) for all toxic emissions, including in-stack continuous emissions monitoring whenever possible (not just for a few allegedly "surrogate" or "indicator" chemicals when the contractor deems such monitoring financially feasible).

Frequent periodic monitoring should be required for PCDDs (including, but not limited to, TCDD), PCDFs and other semi-volatiles of concern. VOC monitoring is not an adequate substitute for SVOC monitoring.

Since sudden "puffs" caused by changes in feedstock composition may be a major cause of toxic fugitive escapes, the automatic shutdown equipment should be the best available. The draft permits do not require this, and the contractor's application does not indicate that the best processes and equipment are proposed. To the contrary, the contractor in several instances has proposed less-than-optimum materials or equipment. At a minimum, the free oxygen monitoring system should be capable of detecting a sudden loss of oxygen in both the stack and the after-burner in order to eliminate or minimize release of incompletely-burned organic compounds. Redundant monitoring devices should be in the secondary combustion train as well as at the end of the exhaust stack, so that the interlock incinerator control system functions as a real-time control.

- *Soils* Both the EPA and the GHWTAC recommend that soil deposition of PCBs and dioxin/furans be monitored. Monitoring should include frequent periodic sampling of soils inside and outside the facility boundary since soil ingestion of animals (dairy and beef cattle, for instance) is a major route of exposure for significant pollutants like dioxins and furans. Soils are also commonly ingested by children (as acknowledged by ENSCO in responding to the EPA requirement for risk assessment of the soil ingestion pathway).

As stated by the EPA regional toxicologist in an internal memo (1 May 1990), "Because of the overall uncertainty involved in the analysis of soil deposition of PCBs and dioxin/furans, and considering the toxicity of these compounds, soil sampling [should] be carried out as part of a routine monitoring program. . . . Air particulate analyses should also be conducted, to determine site-specific values for fugitive dust levels and the respirable fraction of this dust to monitor for PCBs and dioxin/furans which may be re-entrained from surface soil deposition."

Such monitoring is particularly appropriate because, as stated in an earlier EPA memo (Seidel, 12 Jan 1990), "PCBs account for well over half of the annual throughput capacity of the RCRA and PCB liquid wastes at the facility's three incinerators."

- *Biological Resources* Monitoring should be required for indicator species in the food chain, including native and domestic vegetation and animals.

- *Emissions Limits* The draft permits rely on DRE standards and risk assessments based on dilution of pollution, rather than on pollution prevention. As stated above, risk assessment is an inappropriate and unacceptable means of determining emission limits.

In accordance with the goal of non-migration and no net loading of the environment or increase in body burdens, the permits should require Maximum Reduction Technology capable of achieving minimum limits necessary to protect human health and the environment.

Emissions limits should be set in the permits equal to or more protective than levels claimed in risk assessments, or, at the limits required for the EPA and ADEQ trial burns, whichever is

stricter. Limits should take into account a) cumulative effects; b) aggregate, additive and synergistic effects; c) amplification effects due to past exposures of target species; d) non-inhalation pathways; and e) environmental loading and increasing body burdens. In no case should emissions be permitted above *Clean Air Act* standards or above levels required to protect the most sensitive populations.

EPA has determined that particulate levels of 0.02 gr/dscf are achievable; the permit would allow levels of 0.05 at building baghouse and 0.04 at the cement silo baghouse, and, apparently, would require monitoring only during the trial burn/shakedown period. A maximum of no more than 0.02 should be allowed at any point in the facility, and monitoring should be required on a continuous basis.

Emissions should be calculated on hourly averages based on daily sampling (rather than on the 24-hour averages based on 3/month sampling as proposed in the draft Installation Permit), and, a "rolling average" of maximum peak discharge rates should be established as a basis for the setting of total lifetime emissions limits for toxics.

### ***Groundwater***

Arsenical pesticides should be added to the list of substances monitored in the groundwater.

The definition of "pesticide/herbicide" (p. 114) should refer to "pesticides" (a term which includes herbicides and other pest management substances/devices) and should be expanded to include fungicides and all individual pesticides on the ADEQ Groundwater Protection List.

Monitoring should include monitoring of the vadose zone, not just of the leak detection system and of the groundwater.

### ***Financial Responsibility***

ENSCO should be required to establish a trust fund to cover not only corrective action, remediation, closure and post-closure environmental problems, but any impacts, including social impacts, that may occur.

### ***Corrective Action***

The permit should require that ADEQ and the public be immediately notified of any system failure at the facility, and follow up the initial notification within 24 hours (or sooner, if appropriate) with reports that evaluate in detail the severity of the failure and any corrective actions being undertaken.

### ***Emergency Response***

According to the contractor's application figures, fires at the site are a near certainty, yet emergency response capability is not guaranteed by the contract, application or draft permit.

The permits should require the operator to provide funding to the State and the counties along major transportation routes to the facility with funding sufficient to provide state-of-the-art emergency response capability for protection of human health and the environment from the worst-case consequences of a hazwaste incident caused by transport to or storage or disposal at the facility.

The permits should require that at least twenty-four 30-minute Self-Contained Breathing Apparatus (SCBA) units be located at the facility where they are easily accessible to emergency responders. In addition, the permit should require that state-of-the-art equipment (tri-manifold or better) be in place to recharge sufficient bottles to supply responders during a worst-case on-site incident with uncontaminated air.

The permits should specify which and how much fire, spill and leak control equipment besides water the contractor must have on hand, how it will be stored, how often it will be checked for readiness, etc.

### ***Closure***

The closure requirements of the draft permits are extremely vague and unprotective of human health and the environment. The 1981 ADHS Report to the Arizona State Legislature states that "many of these toxic wastes never deteriorate. They literally survive and remain dangerous forever." The Report went on to say that "if a disposal facility. . . is developed in Arizona, the State must be in a position to *guarantee the following into perpetuity*: 1) Wastes contained at the site do not migrate from the disposal area. 2) Land at or immediately surrounding the site is *never* subject to inappropriate land use. The achievement of these two objectives will require *permanent* ownership or control of the land and the operation of a *permanent* monitoring surveillance program not subject to curtailment for budgetary reasons."

None of these conditions will be met by the proposed facility and cannot be guaranteed by the draft or any other permits. Despite all the thousands of pages of technological minutiae in the application and EPA regulations, the fact remains that landfill liners always leak. Recent EPA rules (53 FR 31221; 53 FR 28156-7), in fact, indicate that EPA intends eventually to institutionalize migration from RCRA disposal facilities by "streamlining" procedures and allowing variances from BDAT without public comment. What EPA means by "non-migration" is actually "migration at concentrations EPA deems acceptable. The State and EPA are not now and, arguably, never will be "in a position to guarantee" non-migration from the landfills "into perpetuity" and without such guarantee the proposed landfill must present an unacceptable risk to human health and the environment.

According to a letter of 12 September 1989 from ENSCO to Al Roesler of ADEQ, financial assurance for closure of the tank pads requires consideration of "extensive contamination" of only one containment system; this is insufficient. Financial responsibility should be assured for all potential releases or contamination and no variances must be allowed from the no-migration standard.

Since even the State's estimates indicate contamination of groundwater is not likely to occur for over 100 years, the post-closure care period should be extended to at least that long, or until the most probable date at which groundwater contamination would be detectable.

### ***Changes in Permit Conditions***

The permit conditions should be re-examined every three years and new conditions set as needed to protect human health and the environment, especially taking into account any violations of previous permit conditions that may have occurred.

No change in permit conditions should be allowed without prior public hearing and a showing of no significant increase in risk to public health or the environment.

### *Enforcement*

Enforcement procedures should include unannounced site inspections at least once/month, including physical audits of the waste inventories to assure that waste handled corresponds to manifests and other records

## **Costs and Credibility: A Citizens View of the Superfund Program (1992)**

Michael Gregory, presented to Association of State and Territorial Solid Waste Officials and US-EPA Superfund Managers' Conference, "Getting to Cleanup," Scottsdale, Arizona (12-14 August 1992)

Let me start by saying that like most of the public I'm not a Superfund specialist, but one of Arizona Toxics Information's main functions is to act as a kind of consultant to grassroots environmentalists, help new groups get started, help acquaint them with the science and arcane regulatory structures, their legal and statutory resources, and so forth, so I come in touch with many people who are active on Superfund issues, many of them victims of Superfund sites.

What I'd like to do this morning is give you the benefit of some of my experience in listening to citizens and try to translate that into something like a typical citizen's perspective on Superfund and its problems.

To begin with, I'd like to comment briefly on the presentation of the previous speakers. It's good to hear about a successful program, but I have to wonder if the citizens in Utah feel it was as successful as the agencies feel it was?

As a former civil servant myself, I know that we have a strong tendency to feel we're successful if we're able to get something done without major public opposition. But of course that's not always a sign of success; maybe the citizens were too frustrated to turn out, maybe they felt (as they often do) that there wasn't much point since the government was going to do what it wanted anyway. Poor attendance may not mean that the public is satisfied, only that it continues to be disenfranchised.

Public participation is one of the main areas I'd like to touch on in the next few minutes, along with other Superfund problem areas like credibility; costs and the related issue of slow cleanups; public disclosure and right-to-know; and standards. But before getting into those specifics, let me mention briefly some of the contexts in which the citizen sees the Superfund program, because I think you may not be aware of where citizens and citizens groups are coming from these days.

### **Contexts**

The public seems to me to be particularly aware these days, for instance, that most of our toxic waste sites are in low income neighborhoods; that some 95% of identified sites have not been cleaned up; and that worsening national economic conditions seem almost designed to put many people in such desperate straits that they're willing to accept almost any level of environmental degradation or delay in exchange for the promise of jobs—however flimsy that promise might be.

It's in this context that you're going to hear the phrase "environmental justice" more and more.

Coupled with this is the public awareness of our growing cancer epidemic. Almost everybody these days knows somebody who's died of cancer or has it, which is not surprising in light of national statistics that say one of every three of us can expect to get cancer and one out of every four will die of it. Although rates for some kinds of cancers, lung cancer for instance, are going down, many are going up, including many of the kinds associated with environmental sources.

And the public is not concerned with just cancer; nerve damage, immune system disease and birth defects are often the more immediate problems and there is a continuing background dread concerning transgenerational and synergistic effects that our government scientists don't seem to be looking at at all.

Furthermore, these days the public recognizes the need to address ecological, not just human health effects, including effects of secondary breakdown products, intermedia transfers and so-called residual risks.

While the NIMBY syndrome is alive and well—as it should be—the public is also becoming increasingly aware of the global scene. Global warming, garbage ships and holes in the ozone layer are recognized as problems caused in great part by US overuse of resources and failure to use our expertise and wealth to prevent problems.

In this regard, you should be aware that there is a general feeling among the public that President Bush, despite Bill Reilly, disgraced us at Rio and confirmed the fears of the rest of the world that the US is a market-hungry capitalist monster utterly without environmental or social morality.

Coupled with that is a growing public sophistication about environmental problems and, especially since Rio, a growing world-wide movement calling for Pollution Prevention, the Precautionary Principle, Toxics Use Reduction, and a recognition that the Assimilative Capacity Model (that belief that we can pollute a little bit here and a little bit there and the environment will clean up after us) is bankrupt. We all live downstream and downwind.

### *Credibility/Ethics*

State government and the public should be natural allies, working together to prevent polluting industries from trashing the global common. But usually they're in adversarial mode.

The public would feel a lot better about Superfund if Superfund managers acted as though they recognized themselves as public servants working in the public interest. The adage that a public office is a public trust doesn't apply just to elected officials.

Those of us who work with the agencies on a regular basis know that most agency personnel do recognize that trust and are trying to do the right thing—that they got into the field because they wanted to do something to protect the environment. But as you know there's great pressure to compromise standards not only from the frequent ignorance and corruption of legislatures and governors' offices, but from short-sighted state policies driven by outmoded fantasies of unlimited economic growth.

This pressure, not just the better pay, is what causes so many good people to quit their government jobs and go to industry. I don't know how it is in your states, but in Arizona the Department of Environmental Quality has something like a 30% turnover rate—and it's often the best people who leave. I'd like to encourage you to hang in there and keep fighting the good fight. The public needs you to act as a shield against the forces of greed, ignorance and corruption.

As a former county bureaucrat, I know that working with the public can be a royal pain in the butt, but so is democracy in general—as anyone can tell you who's had to deal with Arizona politics. But we have to keep reminding ourselves that we're all individual members of the public as well as being employees.

I should also mention the public's feeling that if the professionals spent more money on solving technical problems than on trying to change the public's perceptions about what's important—if the government spent more time on risk reduction and less on risk communication—we might be further along and maybe the public would have more trust.

There's a strong tendency on the part of some government and industry professionals to discount the public's concerns. The public's perception is commonly regarded as misperception, the public is considered incapable of dealing with the complexities of the issues, agencies often make decisions despite community unacceptance, and when the public does participate its reward is often no more than a perfunctory thanks-for-the-input letter.

In general, the professionals just don't think waste dumps are as big a threat as the public does—and this professional attitude continues even in the face of continuing reports of higher birth defect rates and other problems around waste dumps.

Not only is the professional view in some cases dead wrong, but it's insulting and misses the point that in a democratic society—even if science did say otherwise—the health and safety of individuals and the will of the public are supposed to have the final word.

Short of that, the public would generally be satisfied with just a little respect.

### ***Participation***

The issue of public participation plays an obvious role in the credibility issue. For instance, yesterday at one of the tables outside I picked up a flyer on the State Superfund Network and I thought, "Wow, what a great chance for the public to keep up to date, tie into computer bulletin boards, etc." But then I saw that as a mere citizen I was specifically excluded from the network.

Why? This is the kind of treatment the public labels as elitism and that makes many citizens resent the government.

Another example of the problem is the official proposed PR statement in the handout on "The Superfund Revitalization Team." The statement proposed that things may go smoothly if someone explains to the (obviously obtuse) public "that long-term actions require years to clean up but pose no immediate threat."

How much more honest would it be to say something like, "This cleanup may take forever, in fact we may never get it clean, and our limited data based on our notion of acceptable risk suggests that there is no immediate risk that is unacceptable to our Washington office, and we are either unable or unwilling to discuss possible long-term affects like transgenerational genetic damage, etc."

Similarly, I'd suggest that once s/he figures out that what is really being proposed is what in mining circles we call highgrading the more outrageous sites so those sites can be dropped from the priority lists (and quite likely never revisited), it won't take the average citizen long to figure out that the initials of the Superfund Accelerated Clean-up Model can be rearranged easily into a more appropriate acronym.

### ***Economics***

As poll after poll shows, the public has little sympathy for all the economic rhetoric about hard times and wise use of limited resources; they're generally recognized for what they really

are—arguments for cutting down on protection of human health and environment. There are many reasons for the public's distrust beyond the obvious, but in general, how can anybody trust a government that brings you high deficits, high unemployment, inflation, deflation, recession, foreign ownership of America, multi-trillion dollar peacetime Pentagon budgets, billion dollar S&L bailouts, million dollar salaries for baseball players and corporate crooks, \$300 toilet seats and ineffective little political wars? Not to mention corruption in office, laboratory fraud and corporate sleaze in the boardroom and in the field?

The public recognizes Reaganomics as what George Bush, before he was elected, used to call it—voodoo economics, and everyone knows that trickle-down theories are another scam. More and more the public sees the whole economic mess as a game where dollars are monopoly money with little relation to reality. And the public also recognizes that the environment is increasingly at the mercy of the really big money of transnational corporations who in the *putsch* for global markets and global dumping grounds can buy and sell most governments.

In that kind of world, the public can't be expected to be happy when agencies come in and say, "Gee, we're sorry, there just isn't enough money to clean up this toxic mess in your backyard now." There's plenty of money; there just isn't enough political will.

The public strongly believes in the polluter pays principle and Superfund was supposed to be the exemplary polluter pays law. That's one of the reasons the public supports triple penalties for recalcitrant companies. In general the public is tired of the government bending over backwards and spending years trying to accommodate polluting industries. The government should go in and start the clean-ups, *then* if necessary go into court.

Unfortunately it can't go without saying that once the polluting company is identified, it must be made to pay. Probably the most disgusting Superfund scam of all is the standard practice by which defense contractors escape the polluter pays responsibility and put the burden on the taxpayer instead by adding their cleanup expenses to their DOD and DOE billings *as a normal cost of doing business*.

### ***Disclosure vs. Risk Assessment***

The same kind of voodoo mathematics that are at the heart of Reaganomics are at the heart of quantitative risk assessment, which the public recognizes as mostly being another scam allowing industries and agencies to juggle figures in order to come out with whatever answer they want depending on how much and whose money they put into the front end of the process—especially since states don't usually have the resources to check out the figures.

After such glowing examples of forthrightness as Three Mile Island and Bhopal and the deliberate inability of CDC and ATSDR to assign blame, the public isn't likely to be very comforted when we're told the figures say there's no problem. "Trust me" and "sound science" just don't cut it anymore.

The concept of risk assessment involves notions of "acceptable risk" that the public is even more suspicious about—especially when government and industry continually misrepresent those risks. I don't know how many times I've heard risk explained in public meetings as a one-in-a-million chance of somebody dying from such and such a cause. But of course one-in-a-million doesn't mean that the death *might* happen. *That* someone will die of it is, as they say, dead certain. What's uncertain is *which* of us will be the unlucky one.

The issue of Risk Assessment is, among other things, an issue of public disclosure and the first

principle of disclosure is that the public should be given an honest statement of the situation.

One of my favorite explanations of risk assessment goes like this. A risk of  $10^{-6}$  means you walk with a loaded gun into a crowded room holding exactly one million people and fire into the crowd knowing the shot is going to kill one person and probably no more. The issue is not *if* someone will be killed or *how many*, but whether you have the right to shoot knowing in advance the lethal consequences.

What Risk Assessment really means, and what government and industry never say, is that decisions made on the basis of quantitative risk assessment and acceptable risk are a kind of premeditated murder. And given the sociological realities of where we create most risks, there is also a premeditated decision about what parts of our population are expendable. Environmental justice again.

Quantitative Risk Assessment asks the wrong question. Instead of asking, How much can we get away with, we should be asking. How much exposure can we prevent? Honest Risk Assessment would disclose the fact that we don't really know very much about risk and would consequently demand that we take the precautionary approach, avoiding unnecessary risks.

One of the things we *don't* usually know, for instance, is the non-cancer effect of low-dose long-term exposure on the most sensitive individual.

And another absurdity is that while we spend a lot of time and money trying to figure out how little of a substance it takes to kill us, the public still hasn't been told the full extent of the waste dump problem. We need an aggressive *site identification* program, including listing of sites caused by legal application of pesticides and other toxic locations now ignored.

### ***Standards***

- *Performance Standards*

For most people the answer to How clean is clean? is the common sense answer, As clean as it was before you got it dirty. Or, in some cases, cleaner; or, if there are compelling reasons not to make it clean, then as close to clean as we can get—and cost to the RP is not generally a compelling reason not to make it clean.

In addition, most people would I think agree that clean means clean from now on. The notion that we should clean up only to the level of current degradation or only as well as what current commenters think future uses will require is only to sacrifice our grandchildren to our present ignorance, our present low level of standards.

- *Technology Standards*

In general, the public expects the government to require best available technology, whether it's for air, water, soil or wildlife cleanup. People are always going to be disappointed when they find out that the polluter was allowed to use less than the best.

And what "best" means is, roughly, the most effective for achieving protection of human health and the environment. In cases of comparable *technical* effectiveness, the most cost-effective remedy should be chosen.

Clay caps and pump-and-treat, as the public has long complained and as the GAO recently

reported, are clearly ineffective, even though EPA keeps allowing them to be used and counts the sites where they are used as "successful" cleanups.

Similarly, the public does not consider incineration an acceptable technology, even though EPA seems to think it's a wonderful solution to all kinds of problems. As Greenpeace says, incineration is just a waste dump in the sky.

It seems clear that the agency should be spending more money to support innovative technology, and then require its use. For instance, fiberoptic sensors are often a more effective and less disruptive technology than monitor wells, but wells continue to be the agency's preferred alternatives.

In closing, and as a last comment on technologies, I should mention that in general the public doesn't accept containment as cleanup. It's just sweeping the problem under the rug, an accident waiting to happen. But on the other hand, it is becoming generally accepted by the public that in some cases a strong argument can be made for long term aboveground monitored storage as the best available technology. As with most of the other issues I've mentioned this morning, we'd rather have the stuff up front where we can keep an eye on it.

## **Health Effects of Hazardous Waste: An Environmentalist Perspective (1993)**

Michael Gregory, for the Sierra Club National Hazardous Materials Committee, presented to U.S. Department of Health and Human Services, Public Health Service, "International Congress on the Health Effects of Hazardous Waste," Atlanta, Georgia (6 May 1993)

The environmental community and the public health community have a close, longstanding and natural working relationship. Both are primarily concerned with health maintenance and disease prevention. The principal model in ecology continues to be the health model and the primary goal of environmentalists is protection of ecosystem health—including both urban and natural ecosystems. And we recognize that our efforts at maintenance of ecosystem integrity and public health protection are inseparably intertwined, sharing many of the same tools, faced with many of the same threats from the same antagonists.

Consequently, it should come as no surprise that environmental organizations like the Sierra Club were instrumental in creation not only of EPA but of ATSDR, of the Superfund itself, as well as the major revisions under SARA that sharpened the agency's goals in 1986.

But ATSDR from its very beginning has been restrained, for strictly political or ideological reasons, from fulfilling its statutory purpose; it took a lawsuit, filed by an unusual coalition of environmentalists (Environmental Defense Fund) and industry (Chemical Manufacturers Association and American Petroleum Institute) to even get the agency started three years after it was mandated by Congress and for the past twelve years the agency has been hobbled with inadequate funding and other bad policy from the top.

It's always a pleasure to talk with like-minded people, and I'm particularly glad to be able to speak with you at the beginning of what we hope is a reversal of that bad policy. We hope the time has finally come when the agency can be given the necessary autonomy—and necessary dedicated funding, including funding independent of the Superfund program—to carry out its broad mission "to prevent or mitigate adverse human health effects and diminished *quality of life* resulting from exposure to hazardous substances" (emphasis added).

For the past few days, we have heard about important advances in knowledge at the cutting edge of public health science. We have heard, for instance of newly-discovered mechanisms by which low-dose exposures can result in specific toxic effects—and, in some cases, greater effects than our high-dose data would predict. We have heard of studies documenting adverse health effects from exposure around hazardous waste sites, especially in our minority communities. For the next few minutes, I'd like to talk to you about the cutting edge and future of public policy that must accompany the science and about the need for you as scientists to help formulate those policies.

Along with the advances, we've also heard a lot this week about data gaps and the need for more studies and more information. We are very sensitive to those needs, and see them in terms of correspondingly large needs for changes in administrative policy and ethical direction. In particular, I'd like to address these matters in terms of three policy areas of most concern to the public: disease prevention, right-to-know, and participation.

### ***The Current Management Situation***

The public, and their representatives in the environmental community, strongly support the

efforts of the scientific community to maintain and expand basic and applied research programs. We want very much to know—we consider it our right-to-know—about the hazards and potential health effects of hazardous waste—which, by the way, we define broadly to include not just those substances on the RCRA and CERCLA lists, but all those toxic and hazardous wastes product we emit, discharge or otherwise dump into our air, water, soil, food and tissue.

We do not, of course, think that the research should go on at the expense of remediation and other reduction programs. If it comes down to a question of research or hazard reduction, the public is almost always going to go for clean-up. But we do not believe that we're stuck in that kind of either-or dilemma. Neither do we believe, as one of the plenary speakers said Tuesday, that it's a question of remediation or prevention. Remediation is a kind of prevention and, again, we see no good reason why we can't have both. As Dr. Davis has said, "disease can be prevented before the etiology has been articulated."

We also keep hearing about "tough economic times," but that is just another way of justifying the crisis management syndrome that has plagued these programs for the past few years. Anybody who has spent much time in Washington knows that the problem is not lack of money, but prioritization.

It's hard to believe that a society that pays multi-million dollar salaries to people whose main job is to move little balls from one place to another cannot afford to protect the environment and the health of its citizens. And it obviously wouldn't take many \$100 hammers or \$300 toilet seats or a few unnecessary bombers to fund all of our basic research and database building and then some.

Not to mention the funds that should be available through that other basic environmental principle known as polluter pays. The Superfund would obviously be a lot more super if the government got serious about enforcing the polluter pays provisions of the Act—for instance, by stopping the current standard practice by which defense contractors get the taxpayers to pay for their cleanups by adding the expense to their DOD and DOE billings. And our toxics programs in general would clearly be a lot healthier if there were some serious implementation and expansion of the testing and prevention provisions in TSCA, a law that has been essentially ignored by past administrations.

It's not usually a matter of no money, but how we choose to spend it. (And in that regard, I strongly suggest that the Atlanta-based agency heads join us on the Hill to fight for their interests—which in so many ways coincide with those of the public.)

I don't have time to review in detail the reasons for the public's concerns about hazardous waste, and fortunately I don't need to since they're well known. They include the fact that an absurd amount of hazardous waste is generated each year in the industrialized nations—over six billion tons or some 50,000 pounds per person in the US; the fact that thousands of wells are closed every year due to contamination; the fact that despite drops in lung cancer rates for white males, we are (as Dr. Davis has pointed out) suffering "unexplained increases in a number of forms of cancer, including: multiple myeloma, prostate cancer, breast cancer, brain cancer, non-Hodgkin's Lymphoma, kidney cancer, testicular cancer, and general cancer with site unspecified."

And cancer may be the least of our worries: there has been a 50% worldwide drop in sperm count since 1938 and the extent of reproductive disorders, immune-suppression disease, nerve damage, transgenerational mutation and various other forms of so-called "non-fatal" illness probably dwarf our cancer problem.

Not to mention problems being suffered by other organisms in our biosystem, and little things like holes in the ozone layer, global warming, and minute-by-minute loss of biodiversity.

We often hear that the public is concerned about hazardous waste but that health and regulatory professionals don't think it's such a big deal. One of the things I'm glad to have found out over the past few days is that statement's just not true, at least not for the professionals here; and as for the others, I hope they wake up soon.

### ***The Reauthorization Context***

It's especially important that those of us with a real concern for protecting public health and the environment be aware right now because we're in the early stages of one of the strongest efforts yet to dismantle the environmental laws of this country. I'm sure that many of you, like me, read with dismay the series of editorials that ran disguised as news features on the front page of the New York Times recently.

For those of you who missed the series (and the clones that have appeared in other papers around the country), suffice it to say that the attack focuses on high costs of the Superfund cleanup program (without mentioning the widespread contractor fraud and other mismanagement which even the Bush OMB identified as a major, and possibly the major cost factor in cleanups); and on scientific uncertainty about animal tests and effects of low doses of toxics. In short, the Times argues that protecting against low doses is unnecessary (since most of them aren't really dangerous) and that current government programs (which are purported to be driven by public hysteria rather than sound science) should be scrapped and replaced (sometime in the indefinite future when science gives us the final answers) with programs based on cost-benefit.

The Times articles are being widely recognized as the precursors to an all-out battle in Congress to rewrite several major environmental laws that are up for reauthorization this session, including CERCLA, RCRA, the *Endangered Species Act* and the *Clean Water Act*.

Following up on the 1990 victory of polluting industries in getting health-based standards dropped from the Clean Air Act, we are already hearing demands to weaken clean-up standards in CERCLA; to de-list wastes from RCRA's hazardous designation, to weaken reporting, corrective action and closure responsibilities for waste facilities, and to drop the "non-migration" standard for waste dumps; to eliminate the "fishable/swimmable" and zero discharge goals of the Clean Water Act.

The argument that low-dose exposures pose a "negligible risk" has already been made forcefully in the attempts of the chemical industry and the previous two administrations to gut the Food Drug and Cosmetic Act's prohibition against carcinogenic pesticides in processed foods.

I don't want to dwell on the regulatory arena, but I think that knowing this context will help explain the tone of urgency you may catch in my remarks, and hopefully will make you aware of the importance of the manner in which your studies and their results are communicated to congressional decision-makers and the public.

### ***Data Gaps***

As many speakers have said over the past few days, there are some severe limitations in our current state of knowledge about a number of important topics. We need more information on the mechanisms, extent, hazard and effects of exposure, including effects of low-dose, multiple exposures, and of exposure to mixtures.

We need more information about different end-points, about subtle effects like mood and behavioral disorders, learning disabilities and other markers of psychological exposure—what Dr. Cone called "environmental psychology." We need to look more at non-cancer effects and non-fatal effects in general.

And I would add that the agencies need to look more at non-human effects, to take more seriously the "natural resource protection" provisions of Superfund, to begin looking for ways of protecting ecosystem integrity.

We need to test more chemicals, to expand the Toxicological Profiles program, to look at the unidentified or uncharacterized constituents in our waste dumps, and at different kinds of chemicals, for instance non-fat soluble chemicals like Methyl Isocyanate, the chemical of concern at Bhopal.

And in that regard, we need to expand ATSDR's emergency incident program, to look at chronic effects of acute exposure. This will sound like a broken record to some of you who have heard the environmental community asking for it for years, but ATSDR should start compiling registries of people exposed in significant emergency incidents. For instance, the 1987 Texas City, Texas disastrous release of hydrofluoric Acid and the 1992 metam-sodium spill into the Sacramento River. These incidents provide opportunities for thorough epidemiologic study of long-term effects of short-term exposures—an area of significant data gaps.

And I would hope that the agency would begin planning now for another major conference like this one to be held next year for the purpose of bringing together all the research that has been done in the ten years since Bhopal.

One of the most glaring data gaps is in identification of hazardous waste sites. According to EPA estimates, only about half of the active sites have been identified. We need to reinstate and expand the Site Discovery program begun in 1980, but dropped by the previous administrations. And we need to break the logjam at EPA that has prevented all known sites from being listed in CERCLIS and, of course, has consequently precluded their being studied for potential health hazards. Clearly, when we expand the CERCLIS list, we also have to provide the necessary funding to do assessments at those sites

Among the more important sites we need to include are those contaminated by non-point sources, which are more or less routinely excluded. In Arizona, for instance, EPA has decided that despite documented levels of dioxin and other chemicals high enough for the Fish and Wildlife Service to issue fish consumption advisories, more than forty miles of the Gila River will not be addressed under Superfund because the source of contamination was agricultural pesticide spraying.

### *Administrative Gaps*

Many of the gaps in our knowledge, maybe most of them, are not due just to the inherent difficulty of the problems, but to infrastructural deficiencies or what we might call administrative gaps. For instance, the need to significantly expand the agency hazard identification programs could largely be satisfied by the shifting of some priorities at EPA and increased budget for the NTP. In particular, if ATSDR isn't allowed the greater autonomy we think it should have, it should certainly be allowed more staff.

Additional staff is especially needed in order for ATSDR to expand its citizen petition program

for initiating health assessments; citizens are often the best source of data for the agency, but the petition program is now given short shrift.

In addition, as pointed out by the Association of Schools of Public Health in their May 1991 report, we need to expand our training programs of health professionals at home and abroad. Hopefully, the Public Health Service budget can be adjusted to give our public health professionals the education they need.

At the local level, we need improved training programs for primary health care practitioners so they can better recognize symptoms of exposure to pesticides, PCBs, lead, mercury and other common hazardous substances.

Also at the local level, we need to develop a policy and program to provide health surveillance and maintenance at sites from discovery through and following remediation—possibly in perpetuity. At present, there seems to be a tacit but unwarranted assumption that once remediation is done there will never again be a problem. Ongoing regular surveillance can be one of our most effective and cost-efficient prevention programs, obviating the need for much of the current focus on disease, trauma and triage.

It seems like almost everybody I talk to from the agencies agrees that better interagency cooperation/coordination is needed, and while some changes have already been initiated by the agencies, it seems clear that even further improvements should be made. For instance, we are sympathetic to the efforts of NLM and others to finally bring together the coordinated national hazardous substances database that was begun 15 years ago with the passage TSCA. It's appalling that this far into the game what little data we have on toxic chemicals is not accessible through a single database, but instead remains—and is in some cases is apparently jealously guarded—in the bowels of separate agencies. It truly is a Byzantine system we've developed and it's encouraging to learn that the NLM program has been redefined to include both toxicology and environmental health data.

The issue of international traffic in toxic and hazardous substances demands special attention and special efforts at international cooperation. While I'm very glad to see the effort at international outreach made by the organizers of this conference, clearly a lot more needs to be done in that direction to ensure that public health science accompanies the toxic substances our country dumps by the millions of tons into developing nations where there is little or no infrastructure for handling them in anything like an environmentally sound manner.

My backyard is the US/Mexico border, a region that has been characterized by the American Medical Association as a "cesspool". I'm sure many of you have heard of the highly-politicized maquiladora industry along the border, and the high rates of anencephaly in the Brownsville-Matamoros area.

One clear example of the need for better binational coordination is the ATSDR health assessment started a few months ago in the fallout area around the copper smelter which closed down in 1986. The site of the former smelter, Douglas, Arizona is a primarily residential city of less than 10,000 across the border from and adjacent to Agua Prieta, Sonora, a city with a population of between 65 and 100,000 which has more than tripled in size in the past few years thanks to the burgeoning maquiladora industries.

The wind from the smelter area blows south into Mexico over 50% of the time, the surface and groundwater both flow south, yet when the ATSDR investigators came in to start the assessment, they (unlike hazardous waste) were constrained to the US side of the border—a prime example

of the kind of unnecessary and politically damaging nonsense that ought to be corrected quickly.

There are a great many other international issues which those of you who are from other countries or who attended Dr. LaDou's presentation yesterday can attest to. We don't have time to do them justice now, but I would like to mention a one or two of particular importance—which will serve as a lead-in to my closing remarks on environmental ethics.

Since about 95% of the hazardous waste and parent toxic chemicals worldwide are generated by the industrialized countries, ethically speaking it should be the responsibility of those countries—and even more properly, of the companies in those countries—to guarantee safe handling of the materials in the importing countries. Given the impossibility of guaranteeing that, we should ban exports. Given the political impossibility of that, there are two feasible steps that should be taken.

First, we should develop an interagency program within EPA, ATSDR and the State Department to comply with our Basel Convention requirement to verify that hazardous wastes exported from this country to another are being managed in an environmentally sound manner in the importing countries. In the case of Mexico, this could easily be done under terms of the proposed free trade agreement and its ancillary protocols.

Second, we should begin the process of passing a law that will unilaterally require US companies operating in a foreign country to at a minimum comply with US environmental and occupational health standards.

### *The Ethics of Sustainability*

While the public generally recognizes that epidemiologic studies are very important, they are also inherently after-the-fact, retrospective, and aren't very useful for preventing disease unless the scientific community takes it upon themselves to bring their study results into the regulatory arena.

They're also not much good for telling us about individual risk. Rather than spending so much time and money on trying to convince an unwilling public that a given dose is not biologically relevant, the public generally would rather have your effort put into figuring out ways to prevent the exposure in the first place.

We need good science to respond to the public's fears—in some cases to allay those fears, in some cases to confirm them—but many years of frustration at receiving unsatisfactory answers to their questions has led to a strong public perception that "more study" just means more delay and that "good science" is a trap that means more time put into figuring out how to count beans rather than cleaning up the mess.

It is this high level of frustration that led a couple of years ago to a grassroots publication about CDC and ATSDR well-known among community and environmental activists. Its self-explanatory title is "Inconclusive by Design." There are some very good reasons for that public perception about the agencies, and some very good reasons why the scientific community in seeking the support of the public should also seek to understand the logic behind that perception. The issues involve ethical questions and what years ago in the dark ages when I was a freshman physics major my professors called "the social responsibility of the scientist."

### *Chemical Trespass*

Let's begin with the concept of chemical trespass. As several presenters have said this week, we've learned a lot more recently about exposure, but still have a lot to learn about effects. As long as that uncertainty remains—and I suggest to you that it's likely to remain a long time (especially long in relation to the length of an average lifetime)—you are going to have a hard time convincing most members of the public that exposure is not equivalent to effect—especially not for a carcinogen or other non- or low-threshold toxin—even if you can convince them that exposure is not tantamount to toxicity.

Partly this is due to the public's acquired resistance to the risk assessment/risk communication syndrome. To an even greater extent, it is due to the public's intuitive common sense about the significance of scientific uncertainty.

But perhaps most significantly, it results from the strong belief of the public in the democratic principle of individual worth—not only because people generally believe in something like "interindividual variability" or biochemical individuality, and that chemicals unlike people should be considered guilty until proved innocent—but because they firmly believe that whether or not there is a scientifically defined toxic effect, exposure in itself constitutes a violation of our basic human and civil rights, an invasion of the victim's most intimate physical and mental person.

Similarly, quantitative risk assessment, as it is practiced, is an ethical issue: it has been argued persuasively, for instance, that when used as a regulatory tool to determine "acceptable risk," quantitative risk assessment is a form of legalized premeditated murder, a decision that some nameless, faceless person or persons with bad luck are expendable and condemned. Usually, of course, given our economic situation, that unlucky individual will most likely just happen to be a member of a low-income minority community.

I'd like to return to the risk assessment issue in a moment, but first I'd like to turn to another ethical concept, one dealing with the issue of cleanup levels, commonly referred to by the question "how clean is clean?"

### *How Clean Is Clean?*

I'm always surprised to find out that there are still people around who aren't ashamed to express the kind of sheer anthropocentric arrogance involved in advocating that cleanup levels should depend on future land use—as though we will be here for 1000's of years or know how future generations will want to use the land; or as if we have the right to determine how their uses should be limited.

When we talk about cost, we must also consider the cost of *not* remediating; consider the planning horizon: we plan for 30-100 years, but the conditions we create, and the waste we generate, will be around for thousands of years.

The issue here is what since the Earth Summit people around the world have learned to call sustainability, by which we mainly mean leaving the earth in at least as good a shape as it came to us.

If, as Dr. Travis asserted on Tuesday, our remediation efforts in fact do not and cannot protect public health, then we should (1) certainly publicize that fact far and wide; (2) contain and secure all sites as best we can for as long as we can; and (3) absolutely prohibit manufacture of more wastes (and their progenitor chemicals) that cannot be cleaned up.

My experience as an environmental activist indicates that the public only agrees to not cleaning up a site when forced to do so by government intransigence, irrefutable evidence that cleanup is impossible or environmental blackmail of the jobs-vs-environment sort.

The public, again in my experience, believes intrinsically in the "sustainability ethic," in our responsibility to leave future generations a healthy planet with as few sacrifice areas as possible.

When you tell the public your assessment says it's ok to leave a site unclean, the public is likely to respond by saying that you don't know enough to tell me that my children and grandchildren and their children are going to be safe drinking the water or breathing the air, eating the food or playing in the soil.

### ***Quantitative vs. Qualitative Risk Assessment***

I began this talk by saying that the environmental and public health communities share many goals and methods, but clearly there are some differences between public and professional assessments of the problem. To a great extent, as I have tried to explain, they stem from the public's dissatisfaction with the slowness of cleanups, and a deep distrust of professional attempts to convince us that our perceptions and concerns aren't valid.

In general, the public is tired (not to say sick and tired) of "risk communication"—which in practice usually means little more than attempts to obfuscate the issues and placate people with platitudes and the twin messages of "Don't Worry" and "Trust Me." I assure you that since the days of Three Mile Island, Love Canal and Watergate, "trust me" just doesn't work anymore.

All of these issues come together in the debate about quantitative risk assessment, which is a methodology built primarily on our ignorance about low-dose effects. If the public has learned only one thing over the past decade, it is that risk assessments are almost invariably numbers games with very high stakes, computer games that can provide the player with whatever risk level you pay for.

Again, the public has become very adept at noting that risk assessment asks the wrong questions: instead of asking how little of a substance it takes to kill us, or how much we can get away with, we should be asking how much we can avoid or eliminate or reduce. We might even go so far as to ask, "how much of this stuff is good for us?"

This deep skepticism of the public of course results in part from being lied to so many times. I would suggest to you that given the condition of things, it is a healthy skepticism. In the absence of a law requiring the manufacturers and purveyors of substances to prove the harmlessness of their products before they expose us to them, it places the burden of proof exactly where it should be. As another activist said at an incinerator hearing I was at recently, "What are the ethics of producing this garbage in the first place?"

Unfortunately, you in the public health community are often placed in the uncomfortable position of being apologists for the polluters. I can't tell you how to get out of that predicament, but I can suggest at least one good way to mitigate the situation, and that is to assure that communities are given full disclosure—qualitative rather than quantitative risk assessment, including clear explanations of the implications and limitations of your research.

As Dr. Lucier explained yesterday, echoing Barry Johnson's talk the day before, as responsible scientists you "need to communicate the uncertainties," including the inferences of your models.

To do so is clearly in line with the purpose of the ATSDR health assessment which, in part, "is intended to provide the community with *qualitative information* on the *public health implications* of the site" (emphasis added). Note that this is quite different from the EPA risk assessment, which "is intended to serve as the quantitative basis for the selection of remedial objectives and strategies for the site."

Let me offer a concrete example of what I mean by full disclosure. Telling the public that certain metabolites of arsenic are weak carcinogens is an unethical act if not accompanied by the information that those same metabolites are developmental toxins. Another example: it is dishonest not to tell the public that due to distributional mechanisms low doses of some chemicals may be more dangerous than high doses.

Another example. The standard "risk communication" about pesticides using the "half-life" terminology is misleading for several reasons; for one thing, it implies that the "half-life" figure is the limit to toxicity; for another, it implies that the toxicity and half-life is the same in Arizona as in Alaska, or the same in an arid environment as a humid one.

No risk assessment can take the place of monitoring and site-specific studies, but full disclosure and qualitative explanations can go a long way towards building public trust.

### ***Public Participation***

In closing, I'd like to mention an even better way for you as scientists to build public trust, and that is for you to become active members of your communities. There are many ways to do this. Let me suggest two.

First, I strongly recommend that the scientific profession take a hint from the legal profession and begin providing pro bono scientists to work with non-governmental advocacy organizations in at-risk communities, to get involved in the Superfund process from beginning to end, working for and with the people in the community.

ATSDR could greatly facilitate this process by extending its worker training program into community training to help communities understand (not just comment vicariously on) the strengths and weaknesses of health assessments. EPA's Technical Assistance Grant (TAG) program isn't very useful to most communities. For one thing, it doesn't provide for actual participation, only for the hiring of an expert to comment on the more or less foregone conclusions that have been drawn up by other industry and government experts. A community training program under ATSDR could be much more useful, for instance by giving communities access to technically proficient non-governmental organizations who could provide hands-on training—especially if those organizations had pro bono scientists working with them.

Finally, let me close by offering a second way for you to become involved: that would be through direct action as individuals. Hopefully, you are all members of the public when you go home, if not before. We need more citizen-scientists and scientist-activists to speak up at public hearings and town hall meetings and in letters to the editor. We need your expertise at the grassroots level, in your own neighborhoods, city halls and state legislatures. In consumer advocacy organizations and environmental groups and on Local Emergency Planning Committees. In closing, I urge you to become involved.

## **On the Proposed H&K Municipal Waste Incinerator (1997)**

Michael Gregory, presented to the Arizona Department of Environmental Quality, Pearce, Arizona (20 May 1997)

Based on what we have seen in the draft permit and have heard over the past two nights, it is clear that the proposed facility is not appropriate, not needed and not safe.

Due to the extreme toxicity of the emissions, the Department of Environmental Quality must take extraordinary measures—well beyond their normal procedures—to protect human health and the environment in this situation.

Evidently, the figures the State has used in developing the draft permit are inadequate and have not properly considered the chronic and transgenerational effects of low-dose, cumulative and multi-source exposures on sensitive populations—including crops, wildlife, pregnant women, the unborn, children, and those with pre-existing medical conditions, such as people like those we heard from last night who have been made chemically sensitive from previous exposures and have moved here for their health, to get away from polluted areas, as well as Vietnam vets who have already been exposed to high levels of dioxin in Agent Orange.

The State needs to recalculate the emissions levels and potential effects on human health and the environment—taking into account the added exposures of our residents from historic lead mining operations in this community and the need for larger than normal safety factors to account for the data gaps in what we know about the effects of some of these chemicals.

And the Department needs to stop the clock on the public comment deadline until the public has had adequate time to review the results of the new calculations.

In regard to this, myself and other members of the Concerned Citizens of Sulphur Springs Valley met earlier and decided to accept the Department's offer to meet with us and representatives of H&K to discuss the draft permit issues, assuming that details of timing and so forth can be worked out.

Meanwhile, among its other tasks, the State should request that the federal government initiate an Environmental Impact Statement since this facility is adjacent to BLM land and will significantly impact wildlife, cattle and vegetation on the public range.

Finally, in order to meet its over-riding statutory responsibility to protect human health and the environment, before ruling on the permit the Department should conduct a study comparing the effects on our air of the current waste management situation, what it would be with the proposed incinerator, and what it would be with a comprehensive county-wide source reduction and recycling program such as we have proposed.

## **On the Plasma Arc Incinerator Proposed for Whetstone, Arizona (2005)**

Michael Gregory, before the Cochise County, Arizona, Board of Supervisors, Bisbee, Arizona (12 April 2005)

At the request of Global Energy Resources (GER) and the recommendation of an ad hoc group known as the Landfill Alternatives Committee, the Cochise County Board of Supervisors is considering providing a Letter of Intent to GER, indicating the County's interest in having the company pursue its offer to build a plasma arc waste-to-energy incinerator near the community of Whetstone, Arizona. GER has claimed that the proposed plant would convert municipal solid waste (MSW) to electricity with little or no pollution.

The County has been well-advised by many individuals and organizations (including the Cochise County Concerned Residents and the local Sierra Club) not to sign such a letter in such an open-ended process.

There are far too many unanswered questions about the GER proposal, about the unproven plasma arc technology, and about GER itself. Answers that have been found are alarming. For instance:

- GER has been in existence for less than a year, and at least one of its officers has been involved in a legal indictment by the State of California
- The plasma arc technology has never been successfully operated on a full-scale commercial MSW operation
- All known facilities using the technology (including those pointed to as models by GER) have resulted in serious public health, environmental, legal and/or financial problems
- Even demonstration-scale operations have failed; tests by the US Department of Defense, for instance, found that the plasma arc process did not destroy chemical weapons as its promoters said it would

GER's claims to provide cheap, clean energy are illusory, or delusory. The company's claims are implausible in some cases, impossible in others. For instance:

- GER has claimed that its process will "destroy" toxic substances in the wastes, but as everyone knows, nothing short of a nuclear reaction can destroy elements; the toxic heavy metals in the wastestream will remain toxic heavy metals, either in emissions to air and water, or in the slag residues. Garbage in, garbage out. To claim otherwise is to claim nothing more than a high-tech version of alchemy.
- The company's claim that the glass-like (i.e., "vitrified") slag is a non-toxic saleable material, suitable for use in roadbuilding or abrasives like sandpaper, is specious at best. Studies by many expert groups, including those made by the State of Arizona several years ago, have concluded that vitrified waste plant residues are properly handled as hazardous waste, and are not suitable for use in roadbeds or other exposed areas, because the slag, like any glass, will break down, releasing the undestroyed toxic metals.
- Similar proposals were made several years ago to use the glassy slag from the defunct Douglas smelter for road material, and it was also found then that the slag was not inert as

claimed but would pose a toxic threat to communities who used it. If the material had been found to be safe, the huge slag piles at the smelter site would have been used up years ago.

In fact, GER's claims have changed rapidly since the company made its original offers to the County: what started as a claim of zero emissions has lately become a claim only to do better than other incinerators. What we are dealing with here is an unproven technology touted by a fast-talking unproven company. The County should not be taken in.

The proposed waste-to-energy conversion plant would present the residents and environment of Cochise County with substantial, health, environmental and financial risks. And it is not needed. There is no crisis. The current landfill, built to stringent EPA standards, has many years of life left. It is true that all landfill liners eventually leak, but it is also true that leak detection systems are built into them, and that repairs and remediation can be done long before the leaks present a threat to the underlying aquifer. Landfills are not the best answer, but they're better than buying a pig in a poke.

It's also true that as Sierra Vista and the rest of the county continue to over-populate, the amount of waste will increase too, requiring more and bigger landfills. Unless of course, the County takes the obvious course of reducing the amount and toxicity of wastes at their source.

The old "ounce of prevention" adage is very apropos to waste management issues. The best place to deal with waste is at the front end of the process, with production, rather than at the end of the pipe. To do this effectively, requires that the Supervisors take three steps—none of which requires making deals with a questionable enterprise touting a risky product:

- First, the County should establish a comprehensive recycling program like those already operating in other communities all over the country.
- Second, the Supervisors should pass an ordinance requiring that all products sold in the County that are likely to end up in the landfill and that contain or produce toxic substances, to be labeled so that consumers know what is in the products and have the option not to buy them.
- Third, the Supervisors should pass an ordinance requiring all vendors who bring such products into the county to pay a small fee (a penny or less per item in most cases); this fee, along with the existing ½¢ sales tax, would be used to run the recycling program and related public education program.

Proponents of GER and plasma arc incineration have accused people opposed to the proposal of being afraid of innovation. In fact, what GER proposes is just old-fashioned pea game under a new name, the same kind of fast shuffling around of toxics that incineration and other waste management schemes have practiced for a long time. If the Cochise County Supervisors wanted to do something really innovative and far-thinking, they would initiate a three-step Toxics Use Reduction program like this instead of indulging in fantasies of high-tech fixes for plain old trash.