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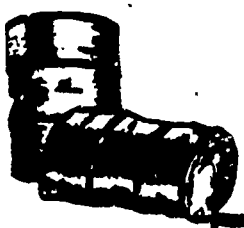
ABSTRACT

Two games are presented which demonstrate the complexity of the hazardous waste problem through an introduction to the: (1) economics of waste disposal; (2) legislation surrounding waste disposal; (3) necessity to handle wastes with care; (4) damages to the environmental and human health resulting from improper disposal; (5) correct ways to dispose of hazardous waste; and (6) the contribution each person makes to the problem. Following background information (from the Ohio Environmental Protection Agency) in the first section, rules and materials needed for the two games are provided in the next two sections. "Hazard," a board game for 2 to 5 players, focuses on the transportation and disposal of hazardous wastes. "The Tox City Controversy," a role-playing simulation, is designed to introduce hazardous wastes and methods of disposal, to illustrate problems involved with selecting a hazardous waste dump site, as well as to provide learning experiences in a role playing situation. (JN)

BULLETIN 703

ENVIRONMENTAL COMMUNICATIONS ACTIVITIES



HAZARDOUS WASTES

TWO GAMES FOR TEACHING ABOUT THE PROBLEM

OSU Cooperative Extension Service
The Ohio State University

by

Environmental Communications Students

Dr. Rosanne Fortner, Instructor

For Sale Publication

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914 in cooperation with the U S Department of Agriculture, George R. Gist, Acting Director of Cooperative Extension Service, The Ohio State University.

HAZARDOUS WASTE DISPOSAL:

TWO GAMES TO HELP UNDERSTAND THE PROBLEM

Every year, billions of tons of solid wastes are discarded in the United States. The U.S. Environmental Protection Agency estimates at least 57 million metric tons of this waste can be classified as hazardous. In addition, EPA estimates that only ten percent of this is disposed of properly. As citizens, we need to be knowledgeable of the hazardous waste problem and understand some of the decisions confronting those who handle hazardous waste. The games that follow should demonstrate the complexity of the hazardous waste problem through an introduction to:

1. the economics of waste disposal
2. the legislation surrounding waste disposal
3. the necessity to handle wastes with care
4. the damages to the environment and human health resulting from improper disposal
5. the correct ways to dispose of hazardous waste
6. the contribution each person makes to the problem

These games were designed for use with people aged 12-adult. The materials were developed by college students as a method of introducing hazardous wastes and their associated problems. This guide will provide teachers and group leaders with the background and materials needed for use of the games.

I. Background information (from Ohio EPA)

What Are Hazardous Wastes?

When we speak of hazardous wastes, many of us think of PCBs, pesticides, dangerous chemicals and the infamous Love Canal. They make the headlines. Very few know, however, that nearly every product we use is associated with a hazardous waste byproduct. For instance, nail polish, many household cleaners and anti-freeze become hazardous wastes if they're not disposed of properly. And our television sets, automobiles and synthetic clothing all leave hazardous waste byproducts when made. The technical definition labels any waste as hazardous if it is ignitable, corrosive, infectious, reactive or toxic. As you can see, this definition encompasses many of the consumer goods and services we need and use.

Who Makes Hazardous Wastes?

We all do. Industry, of course, creates most of the wastes through its manufacturing processes. We buy industry's products. Take gasoline, for example. We willingly purchase it at the pumps, fill 'er up and drive about the city, transporting what is in effect a flammable, dangerous substance if it is spilled. In the car, it's fuel; out of the tank it's a hazardous waste. Our bodies too are sources of hazardous waste. Every time a surgeon removes a diseased organ or the nurse a soiled bandage, the infectious organ or bandage becomes a hazardous waste. And each time we have x-rays developed, low-level radioactive wastes result.

Where Do Hazardous Wastes Go?

If hazardous wastes are not properly controlled, they will contaminate our air, land and water supplies. Only within the past couple of years have we had any rules at all to manage these wastes. Consequently, hazardous wastes have been dumped haphazardly. Some have been dumped in landfills, along the highways and in our water ways. Others have accumulated at chemical dumps where improperly packaged wastes can slowly corrode barrels, leak onto the ground and eventually seep into groundwater supplies from which our nation gets more than half of its drinking water.

What Can These Wastes Do To Our Health And The Environment?

Although not every kind of hazardous waste poses a threat to human health, some are suspected of being cancer promoters. Other substances found in hazardous wastes can sometimes cause changes in cell structure and perhaps lead to inheritable genetic defects. Still others may affect the human fetus during its formation. Such adverse health effects can occur if hazardous wastes are not controlled and disposed of properly. The environment may suffer as well from air, land and water pollution.

How Did Hazardous Wastes Get To Be Such A Problem?

A lack of knowledge about the hazardous effects of many wastes permitted the problem to lie dormant for years. Sporadic reports of illness and environmental damage across the nation led experts to piece together a puzzle which implicated the indiscriminate dumping of hazardous wastes as the culprit in many cases. Very few states had laws which governed the management of such wastes; still fewer had an adequate number of safe disposal facilities. It wasn't until 1976 that a federal law became effective to control and properly manage hazardous wastes. This law, called the Resource Conservation and Recovery Act (RCRA), authorized USEPA to set up a system under which hazardous wastes would be closely followed from initial generation to final disposal. This is commonly called cradle-to-grave regulation.

What Are Some Of The Treatment And Disposal Techniques Available?

One of the most effective ways to deal with the hazardous waste problem is to reduce the amount for disposal. Since hazardous wastes for one industry very often can be valuable resources for another, recycling to recover reusable materials makes good economic and environmental sense. Chemical and biological treatment methods can detoxify hazardous wastes which can't be recycled. Another treatment method is high temperature incineration which destroys the hazardous elements of wastes and reduces their volume. Very dangerous wastes, including PCBs, can be safely disposed of through incineration.

Certain types of hazardous waste such as acids, alkalies and inorganic brines can be chemically stabilized and injected into safe, natural repositories thousands of feet below the surface of the earth. This disposal method is called deep well injection.

Another safe disposal method is secure landfilling. Secure landfills are quite different from sanitary landfills which cannot accept hazardous wastes. Secure landfills can only accept certain kinds and amounts of haz-

ardous wastes. The wastes must be safely packaged in drums and separated according to chemical compatibility. The drums are then methodically buried in ground cells which are lined and surrounded by a barrier of leak-proof clay and liners.

Choosing the best treatment or disposal technique depends upon the type of hazardous waste involved. A combination of the techniques can be incorporated into a hazardous waste facility so that a variety of wastes can be disposed of or treated.

Will Hazardous Waste Facilities Lower Property Values Or Reduce the Quality of Life In A Given Area?

The value of property and the quality of life are very often determined by subjective perceptions. For instance, citizens generally view industry locating in their area as a good thing, even if that industry generates or handles hazardous wastes. They view it as good because jobs are provided and the local economy gets a boost, as do property values.

Bolstered by jobs and economic security, people tend to feel they're living a life of quality as well. If hazardous waste facilities can be viewed as legitimate industry, property values and the perception of quality in life probably will not decrease in any given area. But in order for hazardous waste facilities to gain legitimacy, you and I will have to accept their presence as a necessary business in our highly industrialized society. Without them, we cannot safely treat and dispose of hazardous wastes.

What Can Citizens Do To Help Solve The Hazardous Waste Problem?

Make it a point to become informed about these wastes and the various technologies available to control them. If you accept the premise that hazardous wastes can be controlled through proper disposal, pass the good news on. Become a part of the participation process, especially if a hazardous waste facility is being planned in your area. Caution others that to use local and zoning ordinances to ban such facilities will be detrimental to everyone s health in the long run. The choice belongs to all of us. Do we continue to dump these wastes indiscriminately, or do we begin to control them and dispose of them properly?

II. Hazard! A board game for two to five players.

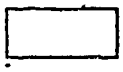
A. Materials: Game board (pages 6 - 9), one die, place markers (p.5), Hazard Cards (pages 10-12), Waste Cards (p.13), Disposal Cards (p.14), money (p.15), and Insurance Cards (p. 5).

B. To Start: Shuffle the Hazard cards and place them face down on the board. Choose a banker who will be in charge of dispensing and collecting money, Waste cards, Disposal cards, and Insurance cards.

Each player (up to four) chooses a truck as a place marker. Players represent transporters of hazardous wastes. If there are five players, the fifth person is the banker.

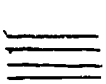
C. Playing the Game: Roll the die. High number starts first; others take turns going clockwise. The banker gives each player $10,000.

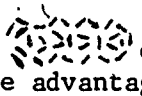
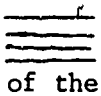
The first player places his marker on the START HERE space and rolls the die. The roll determines the number of spaces to be moved. Notice there are five kinds of spaces on the board:

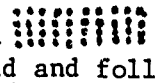


Reward, penalty or no action takes place when you LAND IN a white space.

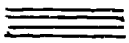
You must LAND IN a [redacted] space to take an opponent to court.

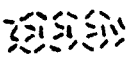


When you LAND IN or PASS a  or  option space, you may CHOOSE to take advantage of the opportunity there or let it go. Watch for these opportunities.

You must LAND IN a  space to pick up a Hazard card, read it aloud and follow its directions.

D. Object of the Game: When reaching STOP you want to make sure you have no waste and as much money as possible. To earn money you must pick up and dispose of hazardous wastes of your choice. You may dispose of wastes properly for a fee or dispose of them improperly for free but run the risk of getting caught by the board, a Hazard card, or an opponent.

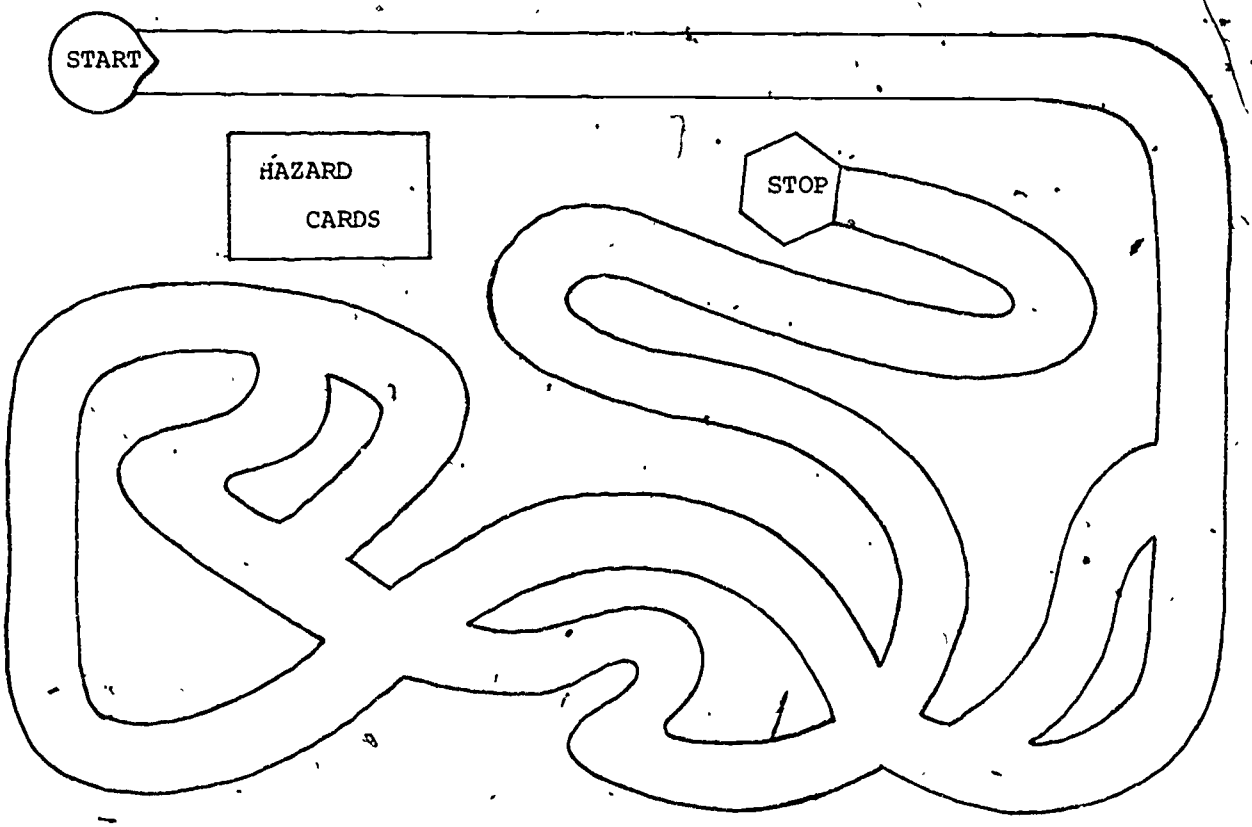
E. Pick-up Options: When landing in or passing over a  pick up option you have the opportunity to pick up one ton of the specified waste. If you decide to pick up the waste the banker will give you the appropriate waste card along with the specified payment for delivery. You will read the card aloud, take note of the needed disposal site and retain the card until the waste is disposed of.

F. Disposal Options: When landing in or passing over a  disposal option you have the opportunity to dispose of any or all wastes you hold if the disposal method is approved of on the waste card. Should you decide to dispose of waste, you return the waste card with the specified payment to the banker. If you elect safe disposal, you need only read the appropriate Disposal Card aloud and return it to the banker. You have the choice of paying for proper disposal or dumping the waste improperly free of charge. If you elect to go "midnight dumping" the banker will give you an Unsafe Disposal card which you read aloud and retain throughout the game.

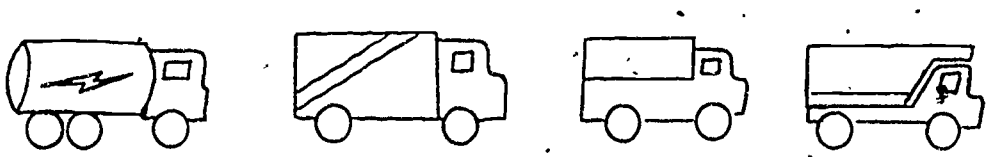
G. Investigation: When landing in a black space you may choose any opponent holding an unsafe disposal card and take him to court. His sentence is to be determined by you. You can fine him $5,000 payable to the bank or send him back ten spaces. Collect a $200 reward.

H. STOP: You must land exactly in the STOP space. All waste must be disposed of through the final Deep Well Injection disposal option. The first player to reach STOP collects a $2500 bonus. When all players reach STOP, their money is counted and whoever has the most is the winner.

Duplicate the gameboard pieces on pages 6-9, trim the edges and tape together or glue on posterboard to construct a board like this:



Glue the rest of this page on cardboard and cut out the place markers and insurance cards below.



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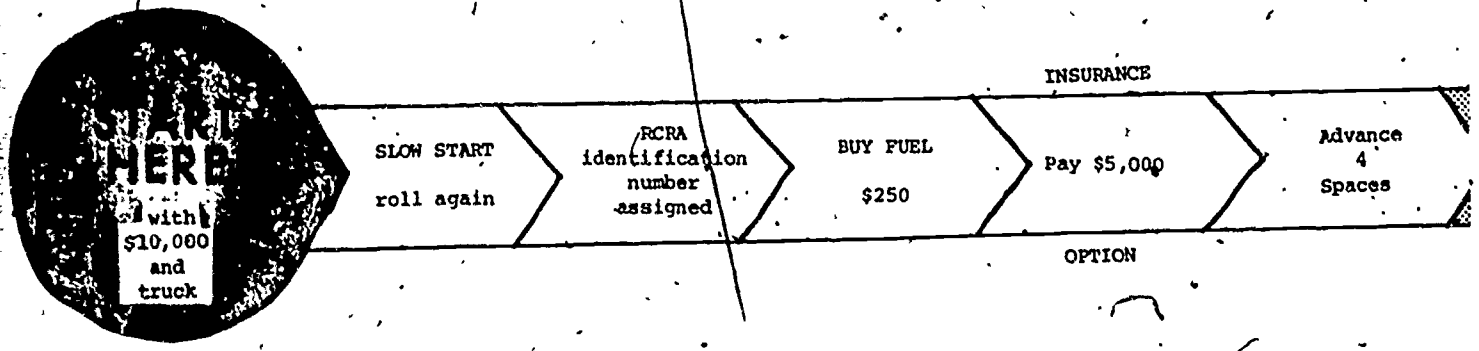

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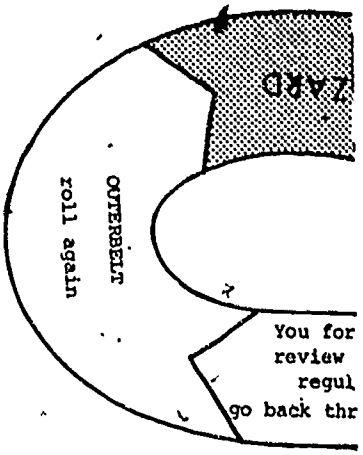
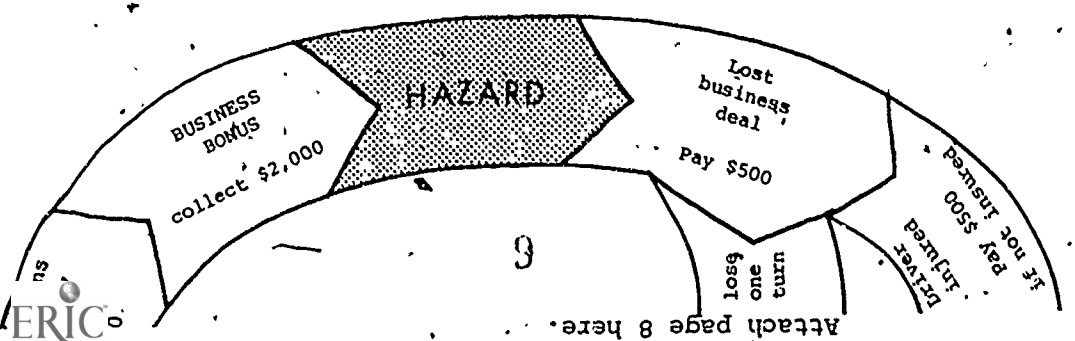
HAZARD CARDS





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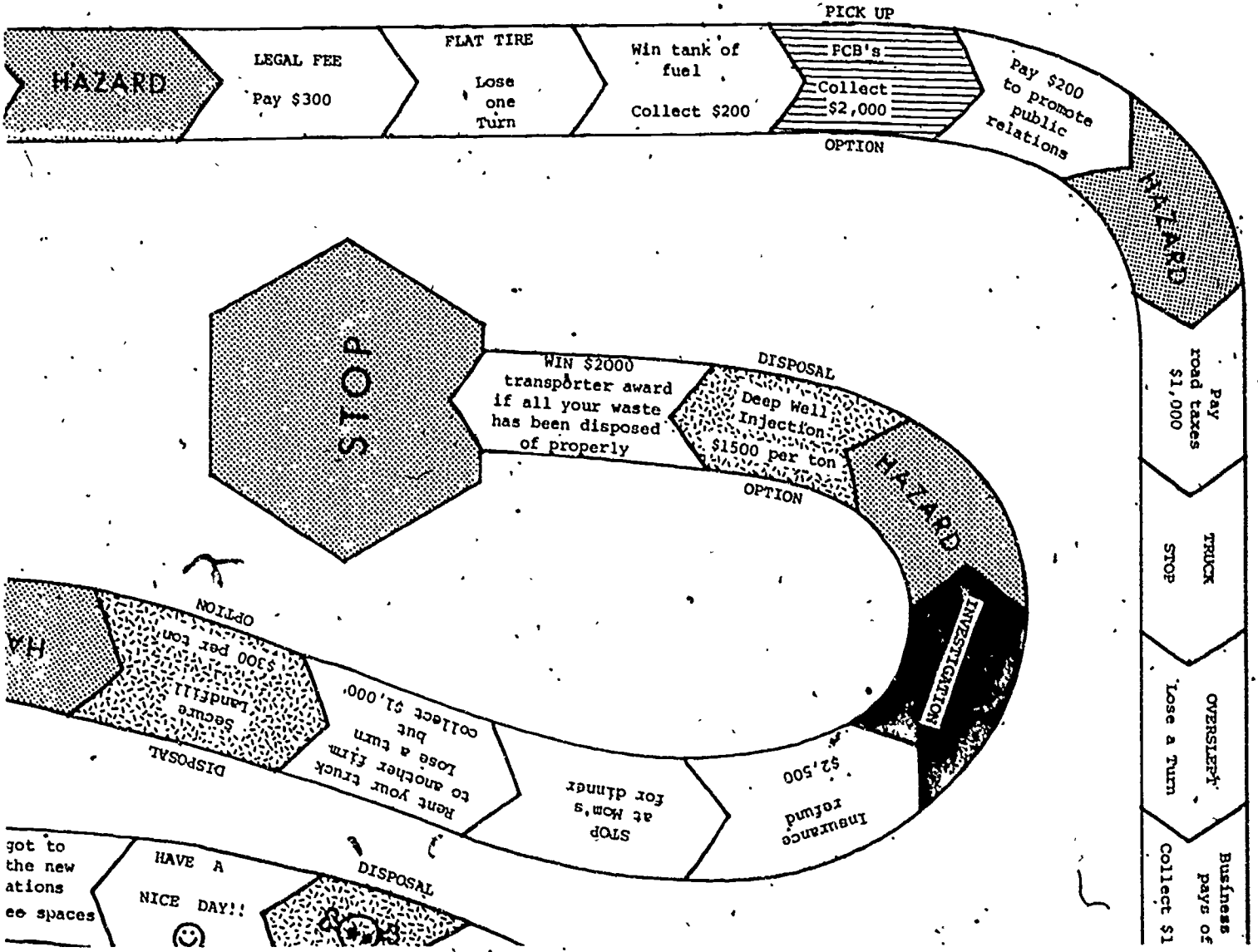

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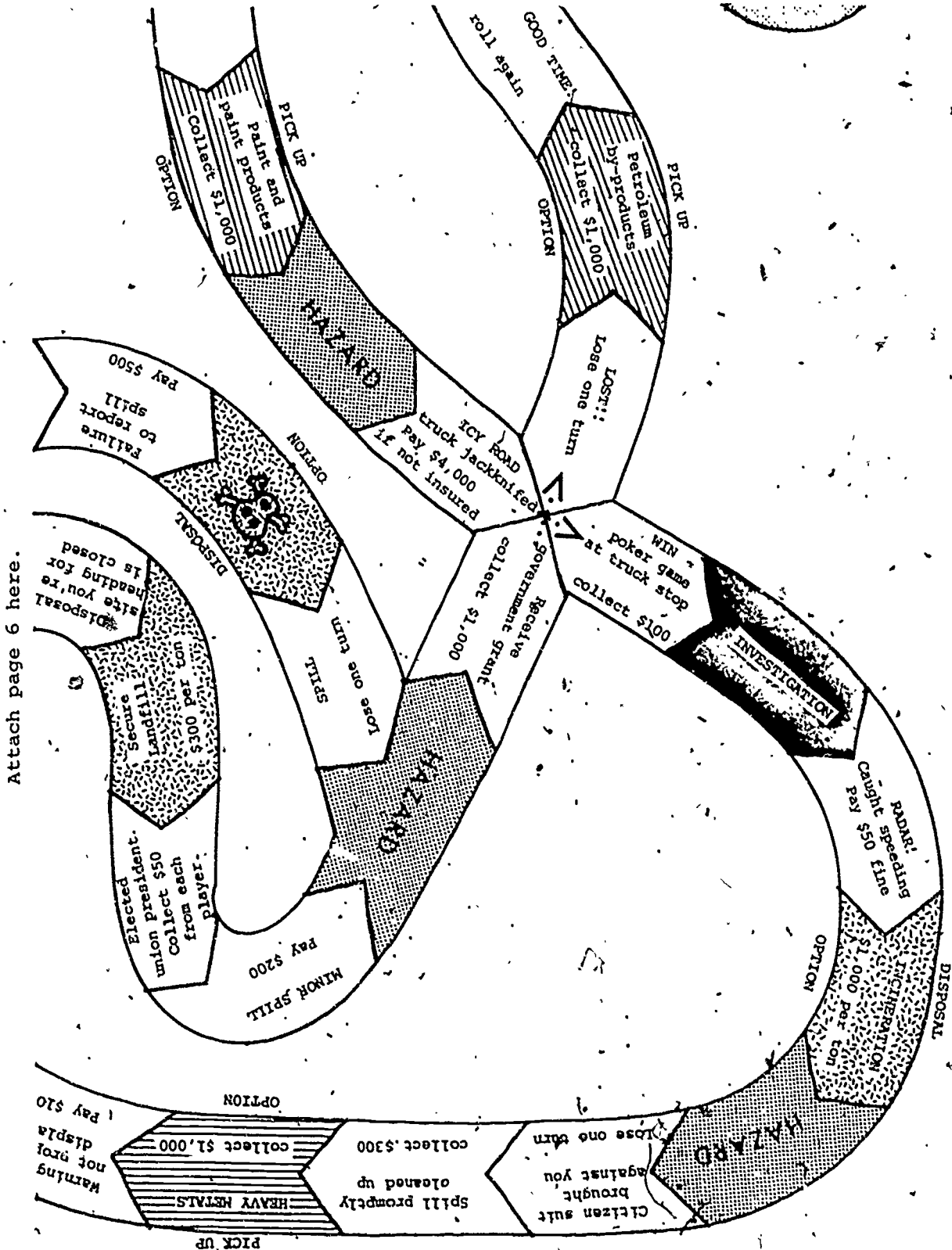

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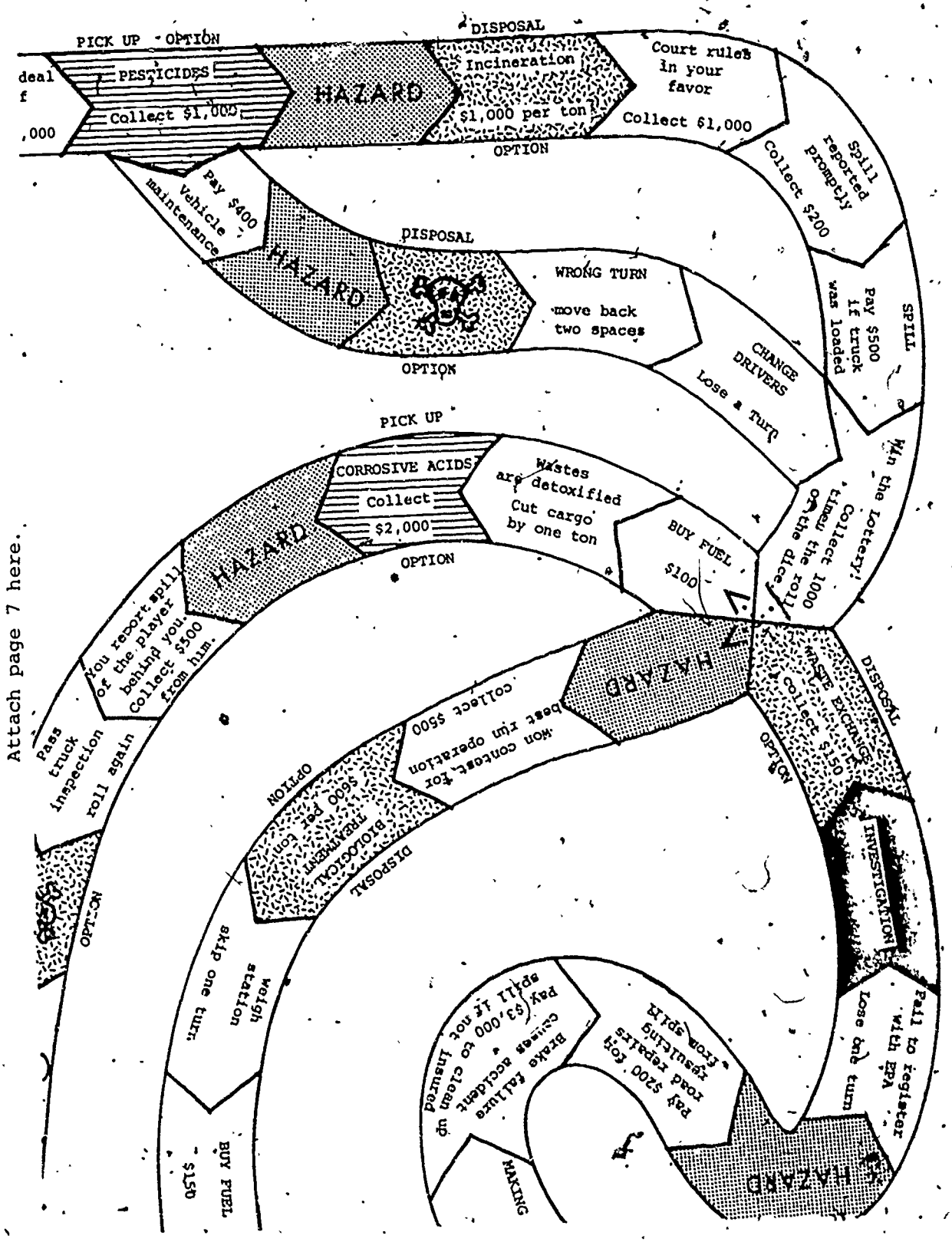

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HAZARD CARDS

(One copy per game - pink)

C to's present disposal capacity falls 4-7 tons short of what is necessary to properly manage hazardous wastes. Lose turn to wait for an acceptable site.

You failed to rinse out your truck after dumping the last load. The residue reacted with other chemicals you were hauling and an explosion occurred. If you have insurance you lose your policy. If uninsured pay $3,000.

The U.S. Department of Transportation requires you to attend a training session to learn more about the chemistry of various wastes. Skip a turn but collect $100 reimbursement.

You inhaled some poisonous gas while filling a tank truck, and must visit a hospital for treatment. If uninsured pay $200.

Ground water in a 30 square mile area near Denver was contaminated from disposal of pesticide waste in unlined disposal ponds. The dumping took place from 1943-1957. Decontamination, if possible, could take several years and cost as much as $80 million. Contribute $100 to help.

You used some dangerous pesticides in your back yard which washed into a nearby stream. Your dog is sick from playing in the stream. Pay $50 vet bill.

You convince your company to sell some heavy metals to a waste exchange for recycling. Recycling is one of the best solutions to our hazardous waste problem. Roll again.

The health of some residents of Love Canal, near Niagara Falls, was seriously damaged by chemical waste buried a quarter of a century ago. You volunteer to help evacuate residents. Lose a turn.

HAZARD CARDS

(One copy per game - pink)

You took a day off to attend an EPA conference on hazardous wastes Because of your attendance you know more about our hazardous waste problem. Receive a $100 bonus from your boss.

You were hauling corrosive acids when you wrecked your truck on a country road. If uninsured pay $3000 to clean up the spill.

An increase in the use of plastics has caused an overabundance of petroleum by-products. Your company insists on safe disposal. Collect $300.

At a town meeting you tried to convince people that they should allow a new secure landfill to be built near the town to help end "midnight dumping". Take another turn.

If you have improperly disposed of a waste, the EPA has caught up with you. Pay $5000 fine and go back 10 spaces.

You were careless at a railroad crossing. A train hit your truck and toxic chemicals were spilled. If you have insurance pay nothing, but lose your policy. If uninsured, pay $2500.

If you have improperly disposed of a waste, the EPA has caught up with you. Pay $5000 fine and go back 10 spaces.

You are hauling wastes for a company which uses only safe secure landfills for disposal of paint by-products. Currently, only 10% of the hazardous wastes generated in this country are disposed of properly. Roll again.

HAZARD CARDS

(One copy per game - pink)

You visit a high school to teach students about our hazardous waste problem. Lose a turn but receive $100 for your services.

You've lost the manifest which the Resource Conservation and Recovery Act requires for all transported hazardous wastes. Lose one turn.

A fellow truck driver was asphyxiated by hydrogen sulfide produced when discharged liquid wastes mixed in an open pit. Lose one turn to pay your respects.

Petroleum by-products were discharged from an industry into a river. The river caught fire and burned a bridge you need to cross. Lose a turn.

If you have improperly disposed of a waste, the EPA has caught up with you. Pay $5,000 fine and go back 10 spaces.

Attend a hazardous waste conference for homemakers. Learn that substances such as nail polish, household cleaners, and antifreeze become hazardous wastes if improperly disposed of. Collect bonus of $50 times roll.

Your uncle stocked up on chlordane before it was banned and you convinced him to stop using it and dispose of it in a proper manner. Take another turn.

You carelessly left a can of varnish stripper near the furnace in your basement and it started a fire. Pay $1000 for damages to your home.

PCB's are found in heat transfers of electric transformers and capacitors, paints, inks, adhesives, and hydraulic fluids. Bioaccumulation through the food chain concentrates PCB's in the fatty tissues of mammals causing reproductive failures, gastric disorders, skin lesions, and tumors. PCB's may be disposed of safely by incineration.

Organochlorine pesticides, many of which have been banned, bioaccumulate in humans, fish and wildlife more than other chemical compounds and can cause cancer. Examples include DDT, chlordane, and dieldrin. Pesticides are disposed of through biological treatment.

Oil emulsion, a by-product of oil refining, is ignitable or explosive if exposed to heat, which can result in human death or injuries. Deep well injection or secure landfill may be used to dispose of petroleum and oil wastes.

A corrosive acid is one which has a pH of 2.0 or less or is capable of corroding steel at a rate greater than 1/4 inch per year. Corrosive acids are generated in the production of petroleum products and metals. In Ohio alone, over 42,000 tons of acids are generated by industries each year. Corrosive acid may be deep well injected for disposal.

Paint, used solvent, latex sludge, varnish remover, and paint stripper are all ignitable if heated and may cause accidental human injury or death. Paint and paint products can be deep well injected or placed in a secure landfill.

Hazardous heavy metal wastes include mercury (batteries, paints and industrial instruments), lead (gasoline, paints, pipes, and roofing materials), arsenic (pesticides, smelters, and glass production), and cadmium (fossil fuels, fertilizers, and zinc refining). Mercury and lead can damage the human brain and nervous system. The others cause various toxic effects of man and wildlife. Heavy metals may be incinerated, placed in a secure landfill, or recycled through waste exchange.

Biological processes can be used to make a hazardous waste less of a hazard. These include activated sludge treatment to destroy organic compounds, composing of organic rich wastes, filters to promote decomposition, and controlled application on land to degrade organic compounds.

Certain liquid wastes can be safely disposed of by deep well injection. Wastes are pumped into rock formations, thousands of feet underground, which are separated from water and minerals by impermeable layers of rock. Deep well injection is the most expensive disposal method available.

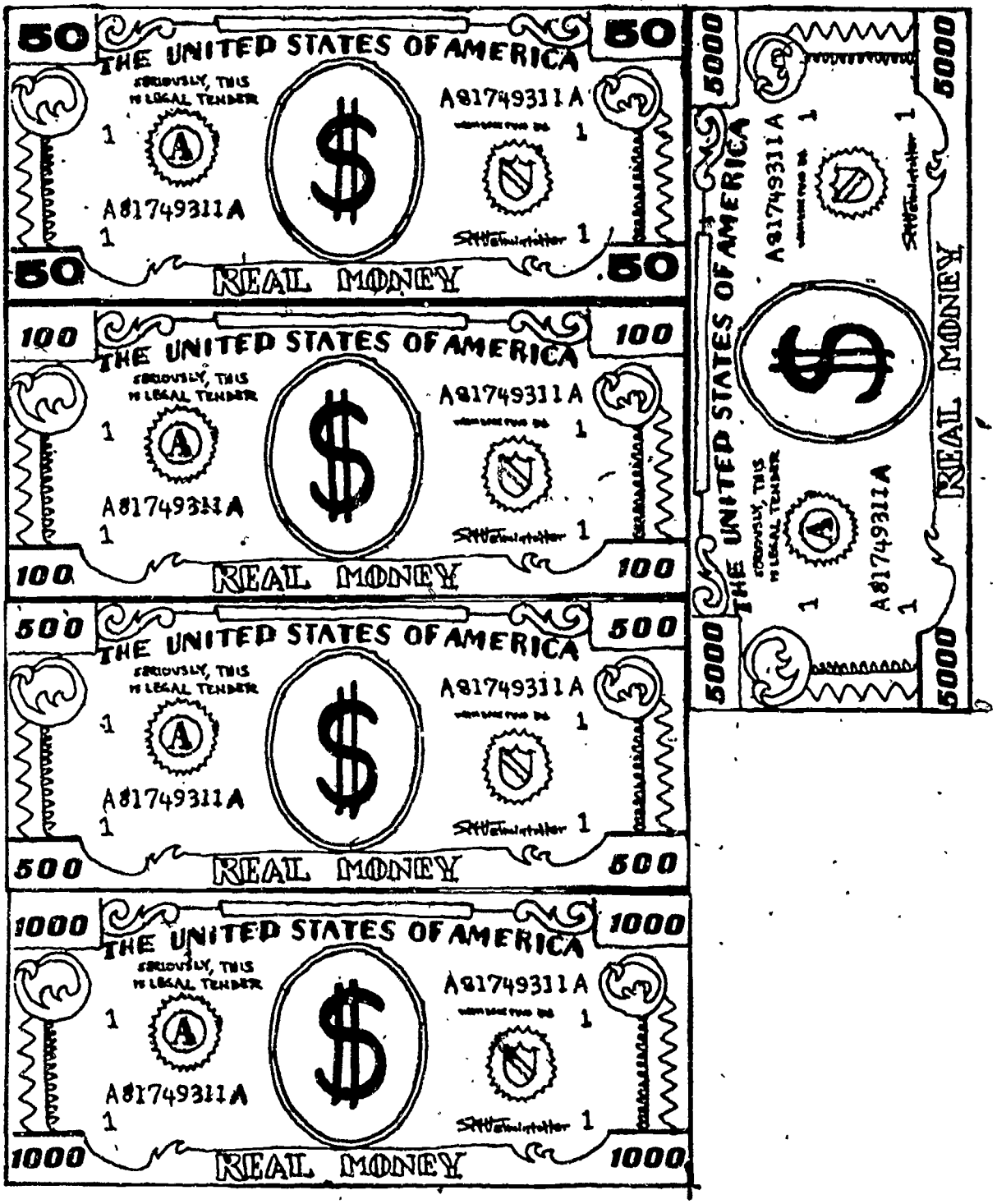
A secure landfill is suitable for the disposal of both liquid and solid hazardous wastes. The waste is contained in drums and is buried in cells. These cells contain monitoring and drainage systems, are lined with heavy plastic liners, and are surrounded by at least five feet of impermeable clay. The development of secure landfills is more difficult than incinerators or deep wells because of strict siting requirements.

Incineration is a highly controlled process that uses high temperature combustion to totally destroy hazardous wastes or convert them to safer substances. Nearly all types of toxic wastes can be disposed of by incineration. It is particularly good for disposal of PCB's.

Hazardous wastes from one industry are sometimes valuable resources for another. Recycling to recover reusable materials makes good economic and environmental sense. About 9% of all industrial wastes can be recycled. Only 20% of this amount is actually recycled.

The cheapest alternative for disposal of hazardous wastes is "midnight dumping". With a truck and a total disregard for public safety midnight dumpers can dispose of wastes cheaply by flushing it into sewers, dumping it into lakes and rivers, dumping it at sea, concealing it in municipal waste for disposal in sanitary landfills, or dumping it on private land.

(30 copies per game - green)



III. THE TOX CITY CONTROVERSY: A Role Playing Simulation

A. OBJECTIVES:

1. To introduce "hazardous waste" and the methods of disposal.
2. To illustrate the problems involved with the selection of a hazardous waste dump site.
3. To experience learning in a role playing situation

B. INTRODUCTION:

Welcome to Tox City, population 7,651. We are located approximately 30 miles from Metro, population 1 million, and 21 miles from Safe City. Our primary industry is agriculture, both livestock and crops. Other than agriculture, the only industry located in Tox City is Eagle Furniture. Most of the residents here work in Metro. We are also the home of many college students who attend Metro University. We are located near Tox Lake, Tox City's water reservoir, which offers a variety of recreational activities such as boating, fishing and swimming. As a growing community, we are proud of the open spaces and clean air we offer to all residents, both present and future.

We are now facing an important dec. .on as a community. Acme Industries, whose regional headquarters is located in Metro, has proposed that a new plant be built in Tox City. This plant will manufacture home cleaning products. However, they also propose an on-location dump site to manage the hazardous waste produced during the manufacture of these products. The Town Council will discuss the proposal during the next meeting and all concerned residents are encouraged to attend. The options open to the people of Tox City are as follows:

1. To build the plant and disposal site.
2. To locate plant out of state, 300 miles away.

C. THE PRO AND CON VIEWPOINTS:

Pro Viewpoints

1. Will provide increased tax revenue for Tox City.
2. Will create jobs for the residents of Tox City.
3. Tox City will be a good place for plant employees to live.
4. Plant will be close to regional headquarters.
5. Tox City is the only area suitable for the proposed dump site within 300 miles.

Con Viewpoints

1. Proposed site is too close to the new high school. (The group should construct a map.)

2. The dump site could pollute the air, water and ground in and around Tox City.

3. There are too many possible hazards to human and animal life.

4. The plant will take up potential residential development areas.

5. Tox City doesn't need the increased revenue or jobs.

D. PROCEDURE:

The meeting is called to order by the Mayor, who is responsible for recognizing speakers and keeping the meeting in order. There are 5 council members, 2 of which have defined viewpoints and 3 of which are left up to the role player. (No role cards for these people.)

The meeting begins with the Mayor, who recognizes the Acme Representative. After the representative explains his company's proposal, the expert from Metro University explains the facts. The floor is then open to all participants. Major speakers should be allowed five minutes to present their cases. Speakers from the audience are limited to one main question or comment each time they are recognized. The Mayor should be attentive to the audience mood and not let the meeting drag or be dominated by certain vocal members of the audience.

Make sure everyone participates and is allowed to do so by being recognized. It is also important to let the 3 council members who are not pro or con adopt whichever viewpoint they choose. Remind the council members that they are allowed to change their views if indeed they have been persuaded by the other side.

E. ENDING THE SIMULATION:

When all the major points have been presented and the audience's views have been aired, the Mayor calls for a vote among the Town Council members. The Mayor should consider the results of this vote as a citizen's mandate, but the final decision will rest with the Mayor, who may choose to ignore or honor the vote.

Regardless of the outcome, all members of the group should be led to consider the effects of the decision. Each audience member, for example, should state what he/she would be likely to do if this decision were actually made. The group leader should encourage a discussion of possible compromises and of the worst possible and best possible results of the decision.

Mayor I.M. Blandski

AGE: 40
OCCUPATION: Mayor

You are 40 years old and have lived in Tox City since it became a city. You have a family and two children in high school.

You are mayor of Tox City. Your primary job at this meeting is to preside. It is your job to:

1. Call the meeting to order.
2. Call the first people to testify.
3. Call on citizens from the audience.
4. Keep order at the meeting.

The first person to testify is Chris Sleek, public relations person from Acme Chemical. Secondly, Dr. X. Pert will give an objective view of the pros and cons of waste disposal.

Each of these people can give up to a five minute opening presentation.

What you must keep in mind is that this is your election year. Your main concern is to stay popular. You may choose people from the floor who favor the opinion you want to favor. Be careful not to commit yourself to a choice unpopular with your citizens.

Give an impression of both being firm and fair to the public, but keep in mind your internal objectives.

Chris Sleek

AGE: 27
OCCUPATION: Public Relations, Acme Chemical

You live in Metro, which is a large city south of Tox City. You have no family, but are well off financially.

Acme Chemical has a long record of safe dump sites, all of them land fill projects. The points you must stress are:

1. Land fills can be managed safely (you may use Dr. X. Pert as a reference for this).
2. It will be monitored constantly.
3. Federal regulations are just too strict for any corners to be cut (not that Acme would).
4. 80% of the generators of hazardous waste dump it on their own sites.
5. The only other safe dump site is 300 miles away, and with rising fuel costs shipment is not practical.
6. Industry will bring more industry. This means more money, people, and jobs.
7. By using land fill the savings may be passed on to the consumer.
8. Tox City is a nice place for Acme employees to live.

Nothing is more important than getting Acme into Tox City. Be careful not to lie or use false information because the people of Tox City will distrust you.

HINT: Get Mayor Blandski on your side. He can be helpful when the meeting gets going.

Dr. X. Pert

AGE: 46
OCCUPATION: Chemistry Professor, Metro University

You live just south of Metro, which is 30 miles south of Tox City. You are chairperson of the chemistry department at Metro University, and you recently testified before a state senate sub-committee hearing on hazardous waste disposal.

You were asked to present the facts on the disposal of hazardous wastes in a sealed secure landfill at the Tox City Council meeting. You cannot, however, express an opinion as to whether or not the Acme plant and disposal site should be located in Tox City.

You may tell the people that the plant must produce hazardous wastes, no matter where it is located. Hazardous wastes are always generated in the production of drain cleaners, oven cleaners, and other household cleaning products.

You can tell the council that hazardous wastes can be safely disposed of but that, when not properly managed, hazardous wastes can contaminate ground water and can pose a potential threat to the environment and public health.

You can inform the Tox City public that the proposed Acme landfill meets all requirements for the safe disposal of hazardous wastes; you cannot, however, know if the landfill will be properly constructed and/or managed.

The following is a description of a sealed secure landfill which may accompany the diagram of the proposed landfill:

> The secured landfill area consists of several "cells." The cells contain monitoring and drainage systems, are lined with heavy plastic liners and must be surrounded on all sides by no less than five feet of very tight, impermeable clay. They must be constructed in an area with little or no ground water and must meet other geological and hydrological requirements.
>
> The waste is contained in barrels, usually 55-gallon steel drums; and is stacked in layers. A six-inch layer of dirt is put between each layer of barrels to provide further protection. The wastes must be compatible to prevent adverse chemical reactions, and accurate disposal records must be kept.
>
> When a cell is filled, more clay and liners are put on top of the cell to seal it from the outside environment. Standpipes and pumps are installed to allow for the removal of any leakage should it be detected by the monitoring system.*

Remember, as a professor, scientist and professional, you must remain neutral at all times.

*Ohio Environmental Protection Agency

Joey Jones

AGE: 55
OCCUPATION: Worker in furniture factory

You are Joey Jones, a member of the Tox City Council, a position to which you were elected. You are employed by the Eagle Furniture Co. where you have worked since you graduated from high school. You are proud of your company's good environmental record, and also the quality of the product you make. You like Tox City as a small town, and have no great desire to see it grow. You have seen other small towns grow too big too fast, and you don't want that to happen to your town. You are opposed to Acme Industries building in your city. Yours is a very emotional argument, with some factual backing.

Here is a list of points for you to bring out to defend your point of view.

1. Tox City is a small town, and its people have survived for a long time without major growth and change, so why change now?

2. You do not trust big business, so you view their report on the safety of their dumping site with a grain of salt. You have seen how chemical dumps have destroyed the community of Love Canal in New York, and you don't want that to happen to your town. You have children and you don't want them exposed to any hazardous wastes.

3. Nuclear power plants, like dump sites, are supposed to be safe but you would have a hard time convincing the residents of Three Mile Island. The utility company told them it would be safe.

4. You don't want the population of your town to increase. One of the reasons so many people like Tox City is because of its small quiet atmosphere. With a new plant and chemical dumping site, you would change the face of the town; it would open the door for other companies to come in with their smoke stacks, pollutants and chemical wastes. This is not for your city.

Terry Jones

AGE: 40
OCCUPATION: CPA

You are a college graduate, with a Bachelor of Science in Business Administration. You got your degree at Metro University and now you work in Metro as a certified public accountant. This is your first term on the Tox City council. You have two children, both in high school, and have lived in Tox City since they were born.

You are in favor of the proposal from Acme Industries. As an accountant, you understand that with the new plant there will be an increase in jobs and in tax revenue. You believe that jobs should come before the environment. Besides, there really isn't a hazardous waste problem, is there?

You have received a number of letters from concerned citizens, most of whom have been in favor of the plant and dump site.

J. P. Bossey

AGE: 45
OCCUPATION: Sales manager for Big Corporation

You are a representative of the city development board, to which you were elected. You have spent your whole life as a resident of Tox City and are respected in the community for your leadership ability. You are a graduate of the University in Metro, and are now employed by Big Corporation, which is located in Metro to which you commute daily. Your position with them is sales manager, so being a good sales person you must be forceful in presenting your case. You have known Tox City from the days when it was not even on the map, but you feel the time for growth has come. Therefore, you are in favor of having Acme Industries locate their new plant disposal site in your town.

Here is a list of points for you to bring out to defend your point of view.

1. The city development board has studied carefully the plans for the proposed plant and disposal site and feel that the disposal site would not physically endanger the community residents. The EPA has told us that the disposal site is a safe one that would not allow chemical seepage into our water system.

2. Tax revenue from the plant would go to support the school system, and since a new school building is being built the added tax income could be used to defer the cost of the building.

3. Tax revenue from the plant would also go toward funding the proposed city sewage plant. This would reduce the cost for the individual home owner who will have to pay for his own hook up.

4. The Acme plant would create new jobs for a lot of people in different fields. People would be looking to move here if they are working in the new plant, so this would encourage the building industry.

5. With a possible population increase, Food Incorporated has expressed a desire to build a grocery store here that would provide us with more jobs, and the grocery store we need so badly.

Kelly MacDonald

AGE: 16
OCCUPATION: High School Student

As Kelly MacDonald you represent the students of Tox City High School who are gathered at the meeting with special permission from the town council.

You are concerned about the fact that Acme's building site is next to the new high school.

Tox City's residents are conservative in nature and had a hard time accepting the new school and all the different things that were to be built into it. It was through the effort of the students that many of the facilities in the school were built.

You and your fellow students had pushed for the new school by sponsoring campaigns for bond issues and levies. While the building was being built you helped the contractors so the cost would be cut and more money would be left over to buy needed equipment for the new building.

After the building was finished you and other students moved all the books, furniture and supplies from the old building. You painted the inside walls and put up the fixtures throughout the building.

Finally, to reward your efforts, the town donated the materials for stadium bleachers which you erected. Each student that helped has his name on a bronze plaque in the trophy showcase at the entrance to the school.

The students are proud of their building and want no part of Acme's presence. They are afraid that the school will have to be moved and that there is not enough money to build a comparable facility.

Micky Riveredge

AGE: 24
OCCUPATION: Student, Metro University

You grew up in Tox City in the older section of town. Your father was the manager of Eagle Furniture plant and was known and respected by all the townspeople.

When you were in ninth grade, your father died of cancer. At that time you worked for the Tox City Troubador as a paper deliverer. You then found yourself in the position of having to help support your family. With all the responsibility of the family bills you barely managed to save enough money for college.

You graduated valedictorian from Tox City High School and entered Metro University. At that time you traded in your paper route for a position as a press room helper with the Troubador.

You commuted to Metro University and worked for the Troubador during the next four years. When you graduated from Metro you received a Bachelors Degree in journalism Summa Cum Laude and received a position on the Troubador as assistant editor.

After a year with the Troubador you received an invitation to enter graduate school at Metro University. You were given a position as a teaching assistant and a complete scholarship to return.

Over the years, you have gained a deep love and respect for nature. You are a member of many of the local groups who involve themselves with the environment.

You are against Acme's intrusion into Tox City and have vowed to stop the company any way possible. You remember the pain that your father went through when he died and see the possibility that more people will suffer like that because of the chemical dump.

Jo Denver

AGE: 22
OCCUPATION:

You are a homeowner. You have two children, both preschool age. You have lived in Tox City for five years and enjoy the clean air and unspoiled environment. You moved here for the kids and feel it provides the proper atmosphere to raise them. You have a high school education and got married before you attended Metro University.

You are violently opposed to the proposed plant and dump site. You feel it will ruin the environment and harm your children's health. You do not trust big companies and feel they are only motivated by the profits they can make. You will do your best to prevent Acme Industries from moving to Tox City. You tend to get very emotional.

Jerry Century

AGE: 48
OCCUPATION: Real Estate Agent

You have lived in Tox City all your life. You have watched the town grow into the quiet rural suburb it is today: a quality area for people to live.

Most of the people who live in Tox City bought their homes from you. You are known throughout the community as a trusted business man and friend.

You are against the Acme plant being built in Tox City because of the effect it would have on the value of properties in the area. You are torn between facts that would one, put more money into Tox City's economy if Acme moved in and two, the reaction of people to the chemical dump site if it were built.

Your greatest fear is that the presence of a chemical dump site will devalue present properties and prove to be a deterrent to future developers.

You live on the edge of town, as far away as any Tox City resident can from the dump site, and feel no danger to your family. You have great concern for the safety of those close to plant site.

Farmer Brown

AGE: 50
OCCUPATION: Farmer

As Farmer Brown you represent a collection of area farmers, all of whom are at the meeting with you.

You are concerned that Acme's dump site will pollute the ground water under your land, that the springs and wells you use to water your livestock and pump inside your homes will be polluted by dangerous chemicals.

As a farmer you've seen and read about the devastation that has stripped others like you of their livelihood. You believe that the future of your farms rests on the results of tonight's meeting.

You also know that area livestock dealers are watching the meeting and they are thinking of joining with area grain dealers in refusing shipments from the area around the plant.

Pat Roberts

AGE: 35
OCCUPATION: Unemployed

You have been unemployed for two months. You used to work for Jerusalem Steel in Metro, commuting to work every day. You only have a high school education and are having a difficult time finding a job. You have been living on unemployment compensation. You have three children, two are preschool age, the other in first grade.

You are in favor of the plant and dump site because you know it will create jobs and you want one! Besides, you have worked in a plant before and are not aware of any hazardous waste problem. You think it has been made up by the environmentalist radicals who are against big business.