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The Pablo-Burford Sustainable Water-Quality Network Simulation

Introduction and Purpose

The countries of Pablo and Burford face a "water crisis" brought on by extreme water quality and quantity problems. The dismal water situation is largely a result of unsustainable agricultural activities in the borderlands separating the two countries. The two nations' leaders recognize the need to address jointly issues concerning the protection of shared underground aquifers and the use of agrichemicals and biotechnology in the region.

Pablo lies directly north of Burford. (See attached map – Appendix A.) Two Pablo states, Belle and Zona, abut the 1,000 mile long border with Burford. Three Burford states border Pablo: Pattern, Grady, and North Rhine. Surface water consists of two rivers flowing through both countries. The Cold River flows from Belle to Grady to Pattern, then back to Grady. The Blue River flows from Zona to North Rhine and eventually joins the Cold River in Grady. The flow pattern of both rivers – from north to south – gives Pablo residents the desired access to "headwaters" but leaves downstream users in Burford with less and poorer quality water. With an average annual rainfall of 10 inches or less, and only two major rivers, border inhabitants are dependent on groundwater for most of their water needs.

Two years ago, the Presidents of Burford and Pablo met to discuss increasing groundwater tensions in the borderlands. At the close of the meeting, the leaders issued a joint communiqué that created the Pablo-Burford Sustainable Water Quality Network (commonly called the Pablo-Burford Network, or PBN). The Pablo-Burford Network is comprised of 10 organizations concerned about managing and protecting groundwater beneath the Pablo-Burford border. Since then, the Burford Environmental Department (BED) and the Pablo Agricultural Department (PAD) have been working together to organize a meeting of network members called "the Summit."

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In the midst of planning for the Summit, a new crisis emerged. A Burford Academy of Science study was released that found 53 percent of 200 wells tested in the Burford state of Grady contain more than the "maximum contaminant level" of Zine, a popular herbicide used on a wide range of crops. The Governor of Grady, Charlie Freeman, called upon the Burford federal government to convene the Summit as soon as possible to discuss the Zine issue. Governor Freeman contends that the Zine problem is a result of Pablo chemical misuse. He has been widely quoted in the newspapers as saying, "Grady is the victim of irresponsible agrichemical use by Pablo farmers – they don't follow our strict standards and we're the ones who lose" and has publicly committed his administration "to wage war against foreign polluters."

Originally the Summit was scheduled for next year. However, due to public concern regarding Zine and Governor Freeman's demands, the Summit was rescheduled for this month, six months earlier than planned. Due to the accelerated schedule, Summit staff have not had time to collect all the data and program descriptions participants would like prior to making decisions. On the positive side, individuals and organizations have not had time to become entrenched in their positions, leaving a great deal of negotiating room.

The existing international agreements do not provide the means to resolve the numerous disputes including this most recent battle between Governor Freeman and the Pablo farmers. It is to address these conflicts that this month's Summit is convened. ***The purpose of the Summit is to reach agreement amongst primary stakeholders on the major issues surrounding groundwater quality and availability.*** The Pablo-Burford Network has no official authority. Network recommendations developed at the Summit meeting will subsequently require ratification by the Pablo and Burford legislative and executive authorities, but all have promised that if consensus is reached at the Summit, all written agreements will be ratified by their legislatures.

The following sections outline the issues to be addressed at the Summit, the general process of negotiation to be followed, the set of stakeholders who will be present, and the specific agreements to be made.

The Importance of Groundwater

In the Burford-Pablo border region, most groundwater, which is defined as any of the various forms of water lying beneath the surface of the earth, is captured in one of several large aquifers. Although there are significant differences between groundwater and surface water, they are frequently linked: contamination of surface water, such as the Cold River, can contribute to the contaminant on of groundwater.

Residents in both Burford and Pablo are extremely dependent on groundwater for basic drinking water; one study estimates that 87 percent of residents within 100 miles of the border rely solely on groundwater. Overall, 72 percent of Pablo residents in Belle and Zona consume groundwater while 64 percent of Burford residents in North Rhine, Grady, and Pattern consume groundwater. Pablo is a less industrialized nation than Burford and the difference in industrial development affects water-use patterns. Pablo border cities use less water than their Burford counterparts; lower levels of water consumption are the practical consequence of fewer water-intensive industries, less adequate potable water systems, and less intensive domestic use. Agriculture accounts for 85 percent of all water use in the borderlands. Ninety-four percent of agricultural

water is used for irrigation, two percent for domestic use, and four percent for livestock. Some areas require irrigation to grow crops; in others, irrigation supplements rainfall. In all cases, the use of irrigation has resulted in more consistent higher yields than would otherwise be achieved.

The Challenge of Sustainable Agriculture

The problem that those who promote sustainable agriculture try to solve is 'how do we produce abundant, healthy food in ways that do not undermine the ecological relationships and associated services of soil, water and seed on which all agriculture ultimately depends?' There is no model that is perfectly sustainable, but that doesn't mean the P-B Network cannot make judgments about possible options being more or less sustainable.

“Unsustainable is 'If we keep doing what we're doing, the evidence suggests agricultural systems and their surrounding environs will degrade, perhaps collapse completely.' Sustainable is 'If we keep doing what we're doing we will be able to produce abundant healthy food for a long time, perhaps in perpetuity.' This approach keeps us focused on solving the problem by sustaining soil fertility, sustaining farm livelihoods, sustaining water quality and water availability" (Manno, J. SUNY-ESF).

Box 1: The Challenge of Water Quality

In the borderland region, water quality continues to decline. Most of the contaminants come from agricultural sources. Currently, almost half of all borderland households boil their drinking water. While boiling is effective in protecting families from some of the effects of poor water quality, it consumes huge amounts of energy. Large quantities of firewood and coal are burned, contributing to deforestation, air pollution, and other energy-related environmental problems. Such practices are also, costly; in Pablo, the boiling of drinking water consumes eight percent of the income of a family in the lowest quartile. Furthermore, boiling does not eliminate pesticide contamination. In fact, some studies indicate that boiling contaminated water may exacerbate pesticide residue problems. Specific water quality concerns include:

Agrichemical

Conventional farming methods have resulted in extensive agrichemical use. Agrichemicals (pesticides and fertilizers) have been detected in food, ground and surface water, rain, fog, air, soil, and human and animal tissue. The effects of these chemicals on both human health and the environment are broad, ranging from water contamination to farm worker illness to poisoning of wildlife. Although the public has focused much of its attention on the issue of pesticides in food during the last decade, new research indicates that the contamination of water supplies may be a much more serious and pervasive problem. Borderland agrichemical use is on the rise. The most dramatic increase has been in the use of herbicides, which now account for 60 percent of the total amount of pesticides used in agriculture. Insects have become more resistant to pesticide, increasing demand for more toxic insecticides.

Salinization

Many borderland farms rely on unlined ditch irrigation. This type of irrigation loses 70 to 80 percent of the water to evaporation and seepage. Salts accumulate in the irrigated areas after the liquid containing them evaporates. Although no cropland in the borderland has been permanently destroyed by salinization to date, the experience of other countries suggests that it can easily happen. Some borderland farmers already blame salinization for reductions in crop yield.

Soil Erosion

There is significant soil erosion in the borderlands. Tillage practices account for a large part of the erosion as farmers plow their fields in order to destroy weeds. This "conservation tillage" practice was recommended by scientists as a way to reduce herbicide use, thereby reducing costs and environmental damage. Ironically, in some areas, conservation tillage has resulted in depletion of soil nutrients, leading farmers to apply additional fertilizers. This experience has left many farmers suspicious of new technologies and of scientists who promise more than they deliver.

Although crop rotations, especially rotations involving forages, are a proven solution to soil erosion, few farmers practice rotations. In Burford, commodity and income support programs reward high levels of production of certain crops. To receive government payments, farmers plant the same crop "year after year regardless of environmental consequences." In Pablo, more farmers rotate crops, but even there the practice is limited. In many cases, farmers cannot afford to "waste" an acre of land as they struggle to feed a hungry nation.

Issues for Network Consideration

The underground aquifers that run beneath Burford and Pablo have degraded to the point where residents on both sides of the border are advised to boil water before drinking unless well tests determine that such precautions are unnecessary. Burford citizen groups and international environmental organizations are imploring government officials to restrict farming practices.

In addition to pleas for improved water quality, borderland residents are asking government officials to address two other problems. First, at current consumption levels, the very existence of the water supply is in jeopardy. A vigorous border "pumping war" began three years ago after farmers in the state of North Rhine found themselves unable to adequately irrigate crops. Rather than heeding the North Rhine experience as a warning sign, residents in both countries now pump more water than ever before in order to draw their "fair share." Wasteful and inefficient use has become the norm, salinization is on the rise, and quantities will not last without serious adjustments in agricultural practices.

The formal controversy in the borderlands concerns the regulation of biotechnology. The Pablo Office of Natural Resources recently approved planting of "NoDrink," a genetically engineered soybean plant capable of withstanding drought conditions. Despite successful NoDrink pilot tests and the promise of reduced agricultural water needs, consumer and environmental organizations on both sides of the border are waging vehement protests. Led by the Earth Coalition (EARTH), these groups have called for extensive governmental controls of all biotechnology products, including NoDrink and they have promised to "boycott all farms and stores supporting [this] dangerous technology."

THE NEGOTIATION

Procedures

Country Caucuses

Prior to the start of formal Summit negotiations, there will be an opportunity for Pablo and Burford federal governments to briefly caucus with their fellow citizens. This is the only scheduled caucus at any time throughout the negotiations; however, Summit participants have a right to request additional caucuses of any sort during negotiation procedures. However, *approval is required from all participants* in order to break from the formal negotiations into smaller caucuses.

Meeting Co-Chairpersons and Facilitators

The role of negotiation facilitator will *initially* be held by the representatives from PAD and BED, as the highest-ranking government spokespeople. But the group as a whole needs to decide up front if PAD and BED will continue facilitating, or if this responsibility will be rotated/shared among those at the table.

Time Budgeting

This is a very ambitious meeting. Network members are expected to budget their time carefully so that all decision items are given due consideration before the negotiations are adjourned at the end of the second day.

Inventing Options

While individual negotiators have specific possible options discussed in their confidential instructions written by Summit staff, network members are encouraged to approach the negotiation process with creativity and flexibility and to invent new options.

Cost Estimates

Financial cost considerations will come into play for most Network members when constructing a list of Summit recommendations. Budget constraints are apparent in Pablo and Burford has only moderate budget flexibility. Farmers report that their profit margins do not afford expensive new innovations and taxpayers complain about subsidizing agriculture. To help guide the choice of options, rough estimates of the costs for each proposal have been compiled by Summit staff. These estimates reflect the financial costs to government only. It is important for network members to realize that under most options private sector individuals will also bear significant financial costs.

The cost estimates provided are meant to be rough estimates. **It is not expected or desired that negotiations become bogged down in detailed financial discussion.** This is important to adhere to for the success of this Summit.

All estimates are in U.S. dollars. Unless otherwise stated or agreed to, the cost of each option would be evenly divided between Pablo and Burford.

Consequences of Not Coming to Agreement

There are several known consequences of failing to reach agreement at this Summit. They are:

Further Resource Degradation: Farmers will continue to overuse and abuse water in an effort to obtain their fair share.

Trade War: Continuing tension between Burford and Pablo over groundwater is expected to erupt into a serious trade war that will affect all major industries, with severe economic consequences for both sides. It will also overshadow upcoming bilateral negotiations on telecommunications piracy, intellectual property rights, and biodiversity prospecting.

EARTH Boycott: EARTH has threatened to boycott supermarkets in protest of NoDrink. Having just survived a similar protest waged by consumer groups angry about antibiotic residues in milk, the food retail industry is anxious to avoid further controversy. If EARTH's boycott is carried out, the produce industry may lose as much as US\$5 million in sales.

Political Leadership: Elections are approaching for Governor Freeman and the President of Pablo. Failing to reach a good settlement at the Summit may affect their popularity at the polls.

Members of the Network

There are currently ten (10) members of the Pablo-Burford Network:

Burford-based Members

Burford Environmental Department (BED): This federal agency has a mandate to preserve the environmental integrity of the nation's natural resources and to coordinate and support state environmental protection efforts. However, it should be noted that Burford federal law delegates significant environmental authority to the states, including the principal responsibility for law enforcement. This federal-state partnership has created some challenges in water management.

The North Rhine Sustainable Agriculture Organization (SUSTAIN): SUSTAIN is an organization composed of organic farmers and consumers concerned with food safety. SUSTAIN is one of the leading voices in Burford arguing for sustainable agriculture. Although many assume that SUSTAIN and EARTH work hand in hand, in fact, they have sometimes been involved in disagreements over agricultural policy.

Burford Farm Association (FARM): FARM is the major farm and agricultural industry organization in Burford. Its members include farmers, agrichemical companies, farm machinery suppliers, and wholesale food suppliers. FARM is interested in securing the same rights for its members that Pablo farmers enjoy.

Governor Freeman: Freeman is the governor of Grady, one of three Burford states that sit along the Burford-Pablo border. Freeman has been attentive to the farm interests of his state, whom he credits with securing his last two re-elections. He generally disagrees with PAD for allowing Pablo farmers continued use of Zine, a substance banned three years ago in Grady.

Pablo-based Members

Pablo Agriculture Department (PAD): PAD is the federal agency that regulates agricultural and natural resource issues. Unlike Burford, Pablo law vests primary authority for all aspects of food

and environmental laws, regulations, and standards with the federal government. During the last decade, the main objective of PAD has been to increase agricultural production in order to meet food needs of its poorest residents.

CONSUME: CONSUME is an advocacy group based in Pablo that is working to end hunger in the country. It lobbies policymakers, educates the public, organizes food distribution services, and provides technical assistance to subsistence farmers.

National Farmers Union of Pablo (UNION): UNION is the primary farm organization in Pablo. It provides lobbying support and technical assistance to a wide variety of farm sector enterprises.

Trade Alliance of Pablo (TRADE): TRADE is an industry group based in Pablo that has formed around a series of border trade issues with Burford. Its primary objective is to increase Pablo exports to Burford.

International Organizations

The Earth Coalition (EARTH): EARTH is a coalition of environmental interest groups based in Pablo and Burford. EARTH was formed specifically to organize around borderland water issues, to link environmental groups in order to share information and resources. EARTH has organized effective media campaigns, and polls show that its credibility is high with residents on both sides of the border.

BIOTECHLINK (BIO): BIO is a consortium of biotechnology companies based in both Burford and Pablo. BIO was established to promote biotechnology and to educate the public regarding the benefits of this emerging technology. BIO is mostly concerned over Burford's ban on NoDrink. BIO contends that the ban is not based on science but is politically motivated. BIO members are also concerned about a ban on Zine, since many BIO members are joint biotech/agricultural companies.

Decisions to Make

Network members eventually must make five decisions. Under each of the decision items, some of the major policy options have been described briefly. Additional options will be brought to the table by individual network members and it is likely that, through negotiation, new emergent ideas will appear.

Note: Cost estimates have been developed for those options posing a significant cost to Pablo and Burford federal governments. Many other options pose significant financial costs to private parties (for example, a water user tax), but are not included in this analysis. While degree of cost will be an important issue for network members, calculating costs for specific proposals is not a primary concern in this round of negotiations. *Due to the limited time for negotiation, it is important to not get bogged down by the details of financing.*

Other than Decision 1, decisions are not intended to be addressed in any particular order.

Decision 1: Establishing Negotiation Rules. (You have one hour – and one hour only – to agree on negotiation rules. Summit staff will provide some rules for you.)

What processes will you use to reach agreements?

How the network chooses to engage in negotiation and decision making is an exceedingly important first step. Network members must decide on ground rules and behavior guidelines for the decision making process including:

- Who will speak when and for how long?
- Which decision items will you address first?
- What happens when side issues or conflict arises?
- How will you know that an agreement has been reached?

Decision 2: Choosing Water Quality Management Schemes

What option(s) should be employed to improve water quality?

Five options have already been identified by various network members. The network is encouraged to think creatively and develop new options, or combination of options.

- **Mandate Production Practices:** Several production practices have been shown to reduce agrichemical inputs. These practices include crop rotations, leaving fields fallow, strip cutting, and border harvesting among others. Proponents argue that all farmers should be required to use a combination of these methods in combination with strict limits on agrichemical use.
 - **Cost:** Enforcement costs.
- **Educate Farmers:** Some groups argue that farmers have strong economic incentives to cut back on expensive agrichemicals and already do so to the extent feasible. Rather than placing more restrictions on farmers, the policy emphasis should be on research and technology extension so that farmers are provided with the most up-to-date knowledge on how to farm with fewer chemicals. Educational programs would include on-farm demonstrations.
 - **Cost:** This position would require hiring additional staff, producing educational materials, paying travel costs for farm visits. The total amount needed to run such a program on both sides of the border would be US\$20 million annually.
- **Provide Green Payments:** Proponents argue that the pay-off for sustainable farming is so great that the government must intervene and provide economic incentives to ensure that changes in production practices will occur. Such incentives, or "green payments" as they are popularly called, would provide farmers with cash payments in exchange for adopting production restraints. At a minimum, Burford should substitute such green payments for its current commodity payment programs.

- **Cost:** There is debate over how much of an incentive payment is needed to alter farmer behavior. The problem in the borderlands is that it takes a much higher payment to lure Burford farmers to green practices than it does Pablo farmers. However, if the funds now spent in Burford to subsidize crop production (known as commodity programs with an annual cost of US\$100 million) were reallocated into green payments, then the cost of this initiative would be seriously reduced. Assuming that commodity program dollars will be diverted, the estimated annual cost of this option would be US\$80 million, divided equally between Burford and Pablo.
- **Provide Cost-Share on Irrigation Improvements:** Proponents argue that irrigation practices are the greatest problem and that resources should be concentrated in this area. Proponents argue for the establishment of cost-share programs to provide modernization assistance to farmers still reliant on open-ditch irrigation.
 - **Cost:** Most of the farmers still using open-ditch irrigation live in Pablo. Therefore, it is recommended that 66 percent of the money allocated under this option be designated for Pablo. Because farms are different sizes and in varying stages of modernization and because we would like to have flexibility to other varying cost-share options (some poor farmers will require total subsidy), the estimated one-time cost for this option would be US \$1 million.
- **Dig Deeper Wells:** No one argues that this option would alter pollution flow. However, proponents argue that it is necessary to confront the immediate problem of unhealthy water. Government assistance would be provided to dig deeper wells to obtain purified water at lower levels. This would be of tremendous help to poor families who typically consume the worst water.
 - **Cost:** Government subsidies for well-digging would cost US\$30 million equally divided between Pablo and Burford.
- **Options Yet to Be Determined: Think Creatively and Develop New Options!**

Decision 3: Choosing Options for Water Use Reduction

What option(s) should be employed to reduce and regulate water use?

Five options have already been identified, all of which entail issues of monitoring and enforcement. The network is encouraged to think creatively and develop new options, or combination of options.

- **Levy a Tax:** It is said that water is so cheap that people are careless in their use of it. Tax proponents argue that a levy will encourage more efficient water use as well as raise needed revenue that can be reinvested in water conservation projects.
 - **Cost:** BED has suggested that such a tax could raise as much as US\$1 million.

- **Restrict Withdrawals:** Proponents of withdrawal limits argue that the fairest and most certain method of reducing water use is to restrict the quantity of water anyone landowner may use.
 - **Cost:** Enforcement costs.
- **Invest in Technology:** At an approximate cost of US\$10,000 "gypsum block" can be installed on the average borderland farm. This technology monitors ground moisture, thereby helping farmers determine exactly when irrigation is needed. Proponents have urged the government to subsidize gypsum block installation to encourage widespread adoption of innovative technologies.
 - **Cost:** The gypsum costs US\$10,000 to install on the average borderland farm. The proposal is to install the block on 1,000 farms in both Burford and Pablo. A typical government cost-share plan would have the government paying 50% of the cost. Under such a one-time arrangement, the total amount needed would be US\$10 million.
- **Reclaim Water:** A consortium of twenty-six private companies has approached the Burford and Pablo governments with a proposal to rehabilitate polluted water for irrigation use. Proponents claim that such a public-private partnership is the most effective way to manage public goods. The consortium requires public financing assistance to defray infrastructure costs.
 - **Cost:** The consortium has requested eighty percent public financing. The total cost of the project would be US\$500 million.
- **Establish Tradable Water Permits:** Under this option, permits are issued for groundwater withdrawal. Farmers are allowed to trade permits among themselves for whatever amount of compensation they agree upon. Proponents argue that this free market approach provides needed flexibility while protecting overall water supplies.
 - **Cost:** Program operation and enforcement costs.
- **Options Yet to Be Determined: Think Creatively and Develop New Options!**

Decision 4: Choosing Options for Chemical Management

What specific action(s) should be taken with regard to Zine and NoDrink, if any?

There are six different options that have already surfaced to date. The network is encouraged to think creatively and develop new options, or combination of options.

- **No Restrictions:** Proponents argue that there is no scientific reason to regulate the use of NoDrink and Zine.
 - **Cost:** N/A.

- **Increase Monitoring and Require Notification:** Proponents argue that because much of the concern regarding these products is not scientifically substantiated, additional notification procedures and enhanced monitoring efforts should be established before any unnecessary restrictions are put in place. If restrictions do become necessary, they should be based on data collected through a systematic process.
 - **Cost:** This will require establishment of new monitoring and enforcement systems. The estimated annual cost is US\$6 million.
- **Establish Use Restrictions:** Proponents argue for various use restrictions on both substances in order to protect highly sensitive aquifer sections, such as recharge areas.
 - **Cost:** It is expected that use restrictions will include designating "sensitive areas" where neither Zine nor NoDrink can be used. If the government indemnifies farmers for protecting these sensitive areas, they will suffer reductions in yields at an estimated annual cost of US\$14 million.
- **Establish NoDrink Barriers:** Proponents argue that physical and spatial barriers should be required for all NoDrink fields in order to prevent any unintended "escape" of the plant and/or its traits from the field in which it is planted.
 - **Cost:** Enforcement costs.
- **Ban Zine:** Proponents argue that Pablo should be required to ban Zine consistent with Burford law.
 - **Cost:** This option requires enforcement costs only if Zine is phased-out over a 5-year period. However, if Zine is immediately banned, the manufacturer of Zine, under Burford law, must be indemnified for products already on the store shelves. The estimated one-time cost for this is US\$10 million.
- **Ban NoDrink:** Extend the Burford ban on NoDrink to Pablo and have both countries observe the ban for a period of no less than three years.
- **Options Yet to Be Determined: Think Creatively and Develop New Options!**

Box 2: Regulatory Standards for Pesticides and Biotechnology

The pesticide Zine, as well as the genetically engineered soybean plant NoDrink, are used in Pablo without restriction. In contrast, Burford has banned NoDrink. Grady has banned Zine, and a Burford-wide Zine ban is pending. The difference in Burford and Pablo pesticide and biotechnology standards has led to a serious international dispute. Because pesticides disperse in the groundwater and food containing pesticide residues is exported, the chemicals used in Pablo eventually flow back into Burford. Thus, Burford finds itself contending with the very chemicals it has prohibited. For this reason, Burford is insisting that Pablo ban Zine consistent with Burford law.

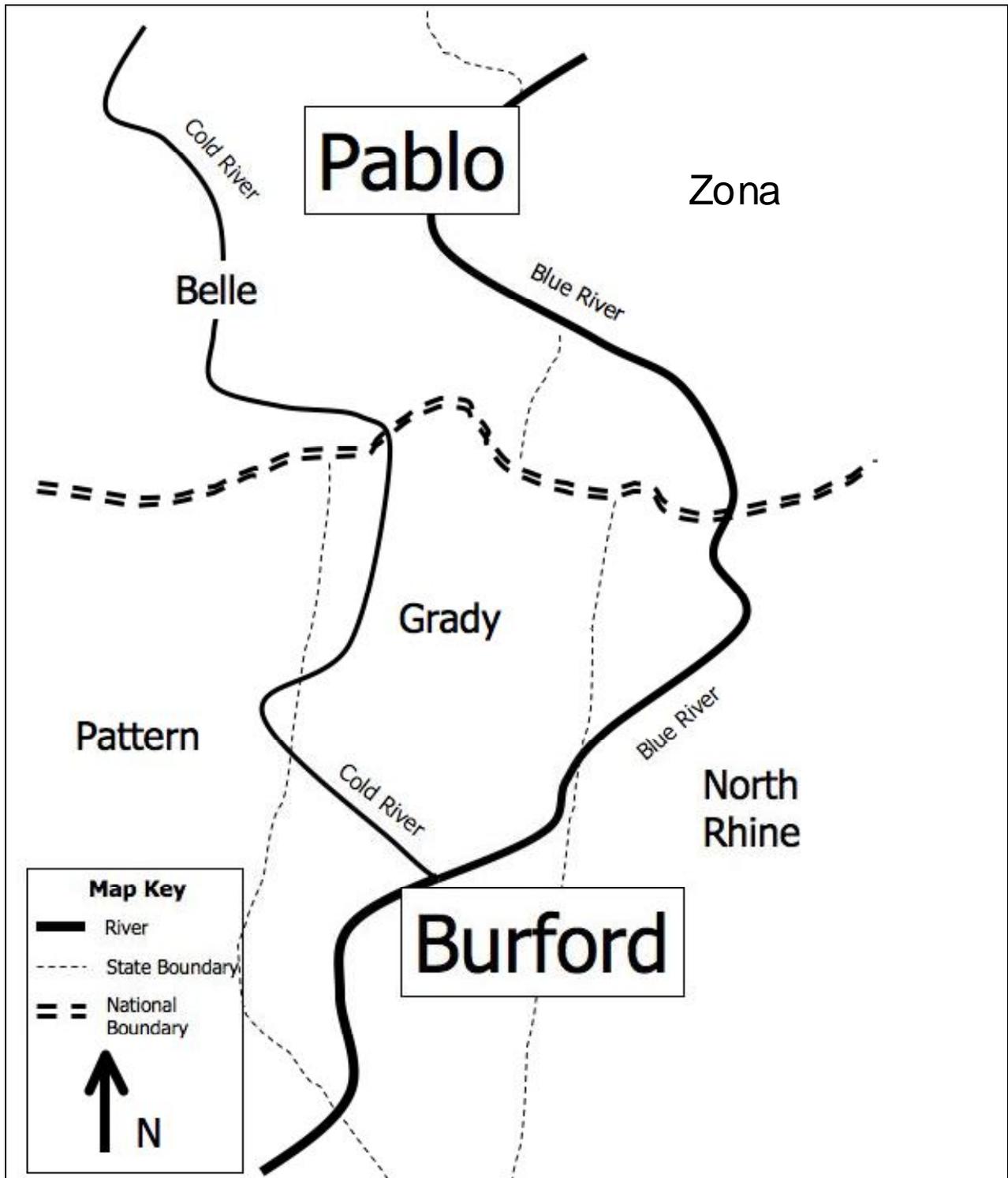
Burford has directed its food safety inspectors along the border to test Pablo food imports for residues of Zine. If such residues exist, the food is then rejected at the border. Pablo leaders are outraged by these so-called inspections, which they call an obvious anti-competitive tactic. Pablo leaders contend that Zine is critical to agricultural production within Pablo but of lesser economic value in Burford. Pablo leaders claim that Burford curtails Zine use, not for the public health reasons claimed, but to establish a trade barrier to protect Burford farmers from foreign competition.

The second issue in contention is the widespread planting of NoDrink in Pablo. NoDrink is a genetically engineered plant that requires little water and is designed to withstand drought conditions.

Decision 5: Enforcing Network Agreements

How will agreements be monitored and enforced?

APPENDIX A: MAP AND COUNTRY INFORMATION



COUNTRY CHARACTERISTICS

	Pablo	Burford
Population	6.4 million	52 million
GDP	US\$14 billion	US\$560 billion
Ethnic Group	Mixed Spanish and Native descent, 95%	Mixed European Stock, 48%; Spanish, 26%; Other
Religions	Romans Catholic: 78%; Mennonite, Protestant, Other: 22%	Roman Catholic: 34%; Protestant: 42%; Jewish: 10%; Other
Languages	Spanish, English	English, Spanish
Education	Years compulsory – 7; Attendance – 60%; Literacy – 54%	Years compulsory – 12; Attendance – 82%; Literacy – 70%
Health	Infant mortality rate – 86.2/1,000	Infant mortality rate – 24/1,000
Life Expectancy	56 years	72 years
Work Force	Agriculture – 45%; Industry and Commerce – 26%; Service – 19%; Government – 10%	Agriculture – 26%; Industry and Commerce – 41%; Service – 23%; Government – 6%
Government Type	Constitutional with powerful executive branch	Constitutional with strong state governments
Suffrage	Required of all adults 18 and older	Universal over age 20
Central Gov't Budget	US\$1.2 billion	US\$75 billion
Trade	Exports – US\$2.5 billion; Imports – US\$2.0 billion	Exports – US\$60.1 billion; Imports – US\$63 billion

APPENDIX B: GLOSSARY

<p><i>Aquifer</i>: Permeable layers of underground gravel or sand that serve as conduits for groundwater flow.</p>
<p><i>Artesian well</i>: A water well drilled into a confined aquifer where the hydraulic pressure is so great that the water flows freely out of the well without pumping.</p>
<p><i>Biological control</i>: Pest control that uses natural predators, parasites, and disease-carrying bacteria and viruses (pathogens) to combat pests.</p>
<p><i>Carcinogen</i>: A substance capable of producing malignant tumors</p>
<p><i>Commodity and income support programs</i>: Burford's federal programs designed to support crop prices and farm income. These programs include all commodity-specific programs (such as the com pro) under which commodity price-support levels are established, set asides are determined, direct payments and nonrecourse crop loans are made to farmers, and agricultural land is diverted from production through paid land diversions and other provisions.</p>
<p><i>Cover crop</i>: A crop grown for its value as ground cover to reduce soil erosion, retain soil moisture, provide nitrogen for subsequent crops, control pests, improve soil texture, increase organic matter, or comply with erosion-control requirements of federal commodity programs. Commonly used cover crops include the clovers, vetch, alfalfa, and rye.</p>
<p><i>Crop rotation</i>: The successive planting of different crops in the same field over a period of years. Farmers using rotations typically plant a part of their land to each crop in the rotation. An example would be a four-year rotation: com-soybeans-oats-alfalfa.</p>
<p><i>Gene transfer</i>: The process of moving a gene from one organism to another. Current biotechnology methods permit the identification, isolation, and transfer of individual genes as a molecule of DNA. These methods make it possible to transfer genes between organisms that would not normally be able to exchange them.</p>
<p><i>Inputs</i>: Items purchased to carry out a farm's operation. Such items include fertilizers, pesticides, seed, fuel, and animal feeds and drugs.</p>
<p><i>Integrated pest management</i>: A pest-control strategy based on the determination of an economic threshold that indicates when a pest population is approaching the level at which control measures are necessary to prevent a decline in net returns.</p>
<p><i>Intercropping</i>: The planting of one crop into another crop, either between the rows or into the stubble of a previous crop.</p>
<p><i>Nonpoint water pollution</i>: Pollution of water that does not enter waterways from a specific "point" source, such as a pipe. Nonpoint pollutants are often carried from dispersed, diverse sources into water channels. Runoff from streets, open pit and strip mines, and agricultural fields are prominent examples.</p>
<p><i>Oncogene</i>: Any of various genes that, when activated as by radiation or a virus, may cause a normal cell to become cancerous.</p>
<p><i>Organic matter</i>: Living biota present in the soil or the decaying remains of animals or plants. The living organic matter in the soil decomposes the dead organic matter. Organic matter in soil increases moisture and soluble nutrient retention, cation exchange, and water infiltration and can reduce soil erosion.</p>
<p><i>Pesticides</i>: Chemicals used by farmers to control pests such as weeds (herbicides), insects (insecticides), plant diseases (fungicides), and nematodes (nematicides).</p>

<i>Recharge:</i> The replenishment of an aquifer with water from the land's surface.
<i>Strip cropping:</i> A method of contour planting in conjunction with rotations that results in alternating strips of crops across the slopes of fields. When practiced with conservation tillage, strip cropping is an important and highly effective erosion control method.
<i>System:</i> The overall approach used in crop or livestock production, often derived from a farmer's goals, values, knowledge, available technologies, and economic opportunities. A farming system influences the choice of methods and practices used to produce a crop or care for animals. Farming systems entail a combination of methods to accomplish farming operations. Conventional and alternative systems may use common practices or methods, but they usually differ in overall philosophy.

APPENDIX C: EVALUATING ZINE

Trade Name:	Zine
Active Ingredient:	zineclor
Pesticide Type:	herbicide
First Approved for Use:	1970
Pounds of Active Ingredients Used Each Year:	23.2 million
% of All Pesticides (lbs) Applied in Region:	17%
Major Crop Uses:	Zine is registered for use on 19 food and feed crops, although it is used primarily to control broad-leaf and grassy weeds in corn, soybean, cotton, and hay crops.
Current Regulatory Status:	BED has classified Zine as a “restricted-use pesticide” available only to trained certified applicators and for use under specified conditions. Grady has suspended all use of Zine indefinitely. Pablo has not restricted the use of Zine in any way.

Groundwater Detection

It has only been 10 years since scientists first became aware of the significance of pesticide contamination of groundwater and only three years since Zine was discovered to be a problem chemical. In Burford, serious contamination seems to be concentrated in the state of Grady. In Pablo, fewer wells have been tested due to the high costs. Large public water supplies have been tested. Few problems have been detected.

Information Submitted by the Pablo Science Advisory Board

Pablo has established the Suggested No Adverse Response Level (SNARL) as the standard for pesticides in groundwater. In the case of Zine, the SNARL is five parts per billion (Ppb). Only one well tested in Pablo has exceeded the Zine SNARL. However, the level detected at that well was extraordinarily high. At 23 parts per million, it was almost 5,000 times greater than

SNARL. This finding, coupled with the outbreak of well problems in Grady, convinced Pablo policymakers to appoint a special board to review data on Zine and advise policymakers with regard to future action. The Pablo Science Advisory Board concluded that exposure to Zine may not increase cancer risk, but farming can.

Information Submitted by The Burford Academy of Sciences

The Burford Academy of Science (BAS) recently released a three-year groundwater study. The most startling BAS finding was the extent to which line has contaminated groundwater in Grady. Well water was tested in 200 randomly selected wells in Grady and Northwest Pattern. The BAS found that 53 percent of the 200 wells contained more than the "maximum contaminant level" (MCL) of Zine. (MCL is the measure developed by the BAS to determine whether pesticides exceed safe levels). The BAS MCL for line is 0.5 ppb, which is one-10th Pablo's SNARL and one-20th BED's MCL. Most of the "problem wells" had Zine detection levels in the range of two-three ppb. Four percent of the sampled wells had Zine levels over 10 ppb.

The BAS did not make any recommendation regarding whether wells should be shut down, but simply reported the information to the public. Upon the governor's recommendation, and with full public support, 62 wells were closed in Grady.

To: Governor Charlie Freeman
From: Senior Staff of the Governor
RE: Recommendations for the Summit

Current Status

We have received more than 48,000 telephone calls and letters on this issue since the public first learned of the ZINE contamination 38 days ago. As you know, Zine was a popular herbicide used by Grady farmers until it was banned three years ago. Although it was the right thing to do, the ban was a tough decision; our farmers lost money and your popularity plummeted. The irony is that our efforts may have been in vain. The Burford Academy of Sciences (BAS) and our own state well studies indicate that either Grady farmers are violating the law by continuing to use Zine, which is highly unlikely, or that the contamination of Grady wells is caused by unrestricted Zine use in Pablo.

Position on Sustainable Agriculture

Grady has learned the hard way that pollution does not recognize political borders. Farming practices in Pablo have a direct impact on the environmental quality in Grady. Thus, to protect Grady residents, any definition of sustainable agriculture or any plan of action agreed to by Summit participants must address the trans-boundary nature of pollution.

Primary Perspectives

You have two primary perspectives going in this negotiation:

1. First, you want to see Zine banned from use in Pablo, or restrictions enacted that will ensure that it will not contaminate the groundwater. Too many Grady residents have suffered serious groundwater contamination through no fault of their own.
2. Second, you want to ensure that any measures taken to promote sustainable agriculture treat Grady and Pablo farmers alike. All too often your constituents have been at great competitive disadvantage in the international marketplace due to domestic environmental regulations.

Negotiating Notes

You are recognized as the catalyst behind the Summit and all eyes will be on you. You must try to work with the Burford Environmental Department (BED), despite strong disagreements in the past. You will need their support of BED to succeed.

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Background on Food Safety

While most people can dismiss agriculture as “somebody else’s problem,” nobody has that latitude with food and water. You may need to remind Summit participants that while many groups of people are not represented at this Summit, they nevertheless “vote” for safe and healthful food with their dollars at market. You may want to cite a new Food Safety Institute poll released last fall as evidence that people want farmers to use fewer chemicals like Zine.

Food Safety Institute Poll

According to the Food Safety poll, 92 percent of consumers feel it is very important for farmers to switch to production methods that rely less on chemicals and more on natural alternatives and 65 percent believe it is very important for the federal government to have stronger policies to reduce the use of agrichemicals in food production. Some 71 percent of those polled said they are very concerned about the impact of agricultural chemicals on water quality, and 68 percent said that they are very concerned about the health effects on young children. There was strong support from those polled for consumers to have a right to know about chemicals used in food production, with nearly 80 percent strongly favoring laws requiring clear labeling of chemicals and pesticides used to grow a food product. The same percentage said they would be willing to pay somewhat more for food produced with fewer chemicals in order to support a reduction in agricultural chemical use. While 64 percent of poll participants support continuing farm subsidies, 78 percent favor reducing those subsidies and using the savings to find ways to reduce agrichemical use; 79 percent of them support taxing chemical companies, and 62 percent support taxing farmers. Upon releasing this poll, the director of the Institute stated: “Our survey found that these concerns about agrichemicals significantly exceeded concerns about other very important health and environmental problems including second-hand smoke, air pollution, and growth hormones in meat.”

Background on Zine

In maintaining that Zine should be banned in Pablo, we suggest you use the following information:

- *Test data are conclusive.* All the studies provide extensive data showing that even the most judicious use of Zine leads to significant groundwater contamination. It is not known how long it will take to purify aquifers currently contaminated by Zine, if it is possible to do.
- *Zine is a health threat.* The Burford Academy of Sciences (BAS) data show Zine to be a moderate carcinogen and that Zine may be neurotoxic as well. This is no surprise as 30 percent of the insecticides, 50 percent of the herbicides, and 90 percent of the fungicides applied to farm products contain agrichemicals that cause tumors in laboratory animals.
- *Banning Zine protects farmers.* Agrichemical use poses a serious health threat to farmers themselves. Frequent exposure from handling certain pesticides raises the risk of cancer.
- *Alternatives are available.* Substitutes are available for Zine. Weed-no-More is arguably an inferior substitute because it is more expensive and not quite as effective. However, it is relatively environmentally benign. Even without chemical substitutes, though, farmers could survive without Zine by engaging in better tillage practices.

Background on Tradable Permits

The tradable permit concept is relatively new. The concept was implemented successfully in the state of California in the U.S. in the area of clean air emissions. We propose modeling a tradable water permit on the U.S. system and thus provide a basic outline of the program.

Clean Air Emissions Trading

The 1990 Clean Air Act adopted a novel approach to lowering sulfur-dioxide emissions, a major acid rain contributor, from electric utility plants. Rather than require each plant to meet a specific limit, it required that emissions be lowered nationwide, by 10 million tons per year by the year 2000. Under the plan, the government issues transferable allowances to each of the 110-odd plants. Each allowance will allow a plant to emit one ton of sulfur-dioxide per year. To emit 1,000 tons of sulfur dioxide in a year, a plant would need 1,000 allowances. The government controls nationwide emissions by managing the number of allowances that can be sold. The system rewards those plants that cut their polluting emissions the fastest and deepest – they can sell their extra allowances to plants needing the extra capacity. It also penalizes those plants that continue to emit excess sulfur dioxide by making them purchase extra allowances on the open market. Prices for the allowances reflect various market factors.

To: Negotiator for PAD
From: PAD Commissioner's Office
RE: Instructions on the Summit

Background on PAD

PAD oversees all agricultural and natural resource regulatory and marketing issues with an annual budget of \$600 million. Unlike Burford, where shared regulatory powers between the state and federal government sometimes lead to conflict and confusion, states defer to PAD for all important decisions. Recently, however, PAD decision-making has come under fire. Pressure from Pablo consumer and environmental groups coupled with budgetary downsizing efforts in the federal government have led some policy makers to propose dividing PAD into two small and separate agencies: one to oversee environmental issues and one to monitor agricultural activities.

Position on Sustainable Agriculture

The level of development in various countries needs to be taken into account in the design of sustainable agriculture programs. Rich countries like Burford should be able to make sacrifices and alter practices in ways that would be difficult for Pablo. Most senior Pablo government officials, including our president, have urged Burford and other developed nations to support debt for nature swaps and similar efforts as a fair way to distribute the world's wealth and burdens. You are looking for other fair ways to encourage sustainable agriculture.

Primary Perspectives

You have three primary perspectives going into this negotiation.

1. First, PAD has few resources to implement any Summit agreements; it would do PAD no good to agree to things it cannot afford. Either non-monetary options should be chosen or resource commitments must be garnered from others at the table.
2. Second, PAD wants Burford farmers to begin rotating crops. Burford has tried to blame Pablo farmers for the unsustainable practices. But most Burford farmers do not rotate crops; a crop rotation is a simple, old-fashioned means of maintaining soil fertility and disrupting pest outbreaks. You are, however, open to other new ideas that may arise at the Summit.
3. Finally, PAD would like financial and technical aid in order to establish an extension service. Our farmers need more research and education, especially concerning proper irrigation techniques.

Negotiating Notes- You have several ideas:

- *Walk the tightrope.* The threats to restructure PAD are real. As a result, we need to walk a "political tight rope" at this Summit. PAD is under pressure on all sides. In other words, we do not want to be accused of being too green or too pro-industry. You are, however, open to new ideas that may arise at the Summit.
- *Push to require crop rotations.* Pablo has been trying to get Burford to eliminate subsidies of Burford farmers for several years in the course of various trade negotiations between our two countries. This Summit provides an opportunity to encourage Burford to alter or even eliminate their subsidy programs for environmental reasons.
- *Undercut industry.* Unfortunately, PAD has not been as protective of the environment as it should be. Political friendships between our president and agribusiness have overshadowed PAD decision-making. Despite past interventions by the president, he has assured PAD privately and announced publicly that PAD has full authority to negotiate at this Summit. Therefore, this Summit provides a perfect opportunity to concede on Zine and NoDrink and to establish some restrictions on their use. You are however, open to other new ideas that may arise at the Summit.
- *Ask for money.* We have been told that the Burford Environment Department representative has discretion to commit a certain amount of money to implement and support Summit agreements. Ask!

Background on Research and Extension

To address information gaps, PAD would like Summit help in establishing an innovative extension service. The PAD extension service would differ from the one that now exists in Burford. Rather than working in the laboratory or on university farms, PAD extension personnel would work directly with farmers at real farm sites. This would allow a two-way flow of information. The information transfer would be enhanced by the cooperative working arrangement inherent in PAD extension design and would accomplish many things, such as:

- *PAD extension will reduce chemical use.* PAD extension would help farmers reduce chemical use by providing farmers with unbiased information on chemical needs and by working with farmers to design experiments on their farms to determine non-chemical means of production.
- *PAD extension will include farmers as equal partners.* Farmers will not be clients of PAD extension but rather equal partners. PAD will involve farmers as part of interdisciplinary teams in conducting field tests and demonstrations at the farm level. This will ensure that research results will hold up under real life conditions.
- *PAD extension will focus on systems research.* Most research has focused on individual farming practices in isolation and not on the development of agricultural systems. PAD extension will not make this same mistake. We will consider whole-farm needs in designing and evaluating production systems.
- *PAD extension would deliver information effectively.* The direct contact between farmers and extension personnel will ensure effective and efficient information sharing.

Once again, you also are open to other new ideas that may arise at the Summit.

To: BED Negotiator
From: BED Commissioner's Office
RE: Instructions for the Summit

Background on BED

As you know, BED is the federal environmental regulatory agency for Burford with an annual budget of \$1.6 billion. While BED does regulate agrichemical use, it has little direct control over agricultural production. However, because this Summit is driven by environmental concerns, Burford President Quinn designated BED as the lead federal agency. Thus, BED views this Summit as an opportunity to positively impact Burford agricultural affairs.

Position on Sustainable Agriculture

Sustainable agriculture is critical to achieve. We have supported cheap food policies for too long. The hidden costs are now apparent. BED supports all kinds of approaches to pollution control, from those that are heavily regulatory to those that are voluntary or market-driven. BED expects that Burford residents will have to help pay the bill for the transition that must occur in the borderlands.

Primary Perspectives

You have three primary perspectives going into this negotiation:

1. First, BED thinks that a water tax imposed on groundwater withdrawals by Burford and Pablo farmers might be a good thing. A tax might be an effective way to halt the pumping war that is jeopardizing water supplies for both countries. It might create an incentive for efficient water use, and it would also provide up to \$100 million in revenue to help defray Summit implementation costs. You are, however, open to other new ideas that may arise at the Summit.
2. Second, BED would like to see "green payments" explored. Green payments might provide farmers with an incentive to change production practices. Green payments, in combination with a tax, might ensure the longevity of our water supply, while, at the same time, reducing the economic impacts of such a tax. You are, however, open to other new ideas that may arise at the Summit.
3. Finally, BED would like to explore the lifting of the Burford ban on NoDrink as well as restricted use planting of this water-saving soybean plant. Once again, however, you are open to new ideas.

Negotiating Notes

- *Financial leverage.* You are authorized to commit up to \$200 million to implement Summit agreements, but only if you receive adequate commitments on green payments and use restrictions on NoDrink and Zine planting. Guard this information and reveal it at the most strategic moment.
 - *Coalition with EARTH.* We suspect that EARTH will be your greatest ally at the Summit. EARTH may be willing to help BED take over some of the agriculture department's authority for agricultural affairs. You may want to caucus early on with the EARTH representative to develop common strategies.
-

Background Information on Taxes and Tradable Permits

Managing Groundwater

You might propose levying a tax on groundwater use by Pablo and Burford farmers. The Summit agreement must include an effective strategy for halting the pumping war on both sides of the border. As long as water is free, farmers have little incentive to use water more efficiently through better irrigation management. A tax might create such an incentive. By making water use a real cost of production, a tax might persuade farmers to institute innovative irrigation technologies and practices designed to reduce water use. A recent Burford university study showed that taxes on the consumption of natural resources have proven effective in many other countries in encouraging innovation and technological change. Another benefit of a tax is that since farmers cannot reduce their use of water to zero, our government would collect revenues.

Since it is important to reduce agricultural water use in both countries, you believe the tax must be imposed on both Pablo and Burford farmers. At the same time, you realize that the tax needs to be equitable. The Pablo Agriculture Department is sure to oppose any tax that doesn't take account of the fact that Pablo farmers have far less ability to pay.

You may encounter objections to the idea that Pablo farmers should be taxed at all. If you do, you will need to remind other parties that the real purpose of this tax is to change behaviors on both sides of the border. Pablo farmers use water very inefficiently. As long as water is free, they may not have any strong incentives to improve their irrigation systems, and they will most likely continue to withdraw more water than they really need from an already threatened aquifer. Moreover, the fact that Pablo farmers use water inefficiently means that they may be able to make adjustments quickly to lower their tax burden. Your office estimates that Pablo farmers could easily reduce their tax burden by as much as one-third over time. In contrast, the more efficient Burford farmers will not have equal ability to come up with water savings, at least not in the short-term. Thus, BED expects that Burford farmers will bear more than their fair share of this tax initially.

Another option for reducing water use is tradable permits. Tradable permits share many of the same incentive effects as a tax on water. The government would issue a limited number of water permits. Each permit would entitle its owner to use a certain amount of water. Water users could buy and sell the permits among themselves. The cost of purchasing a permit or forgoing the

revenue from selling the permit to someone else has the same incentive effects as a tax. BED, however, would not raise revenue if the tradable permit option is selected.

Background Information on Green Payments

In your view, this Summit provides a great opportunity to make "green payments" a required course of action for the Burford Government. For several years BED has argued that the agriculture department should discontinue old-style commodity-support programs that cost taxpayers money but do nothing for the environment. BED is not opposed to income subsidies. However, we would like to propose that the government should get something in return for its money. Green payments, in contrast to commodity programs, require farmers to meet certain environmental goals.

Of the \$80 million BED has available for Summit green payments, half would go to Pablo farmers. PAD could then decide upon an appropriate payment scheme for their country, based on farmer income, farm size, and other factors. In Burford, the \$40 million would be added to the \$100 million from Burford commodity programs. Burford farmers have higher incomes than their Pablo counterparts, and we also have far fewer farmers in total. Thus, the sum of \$140 million should afford sufficient incentive payments to make this program work.

Green payments would be provided to farmers for engaging in the following activities: rotating crops; retiring sensitive land from production; practicing integrated pest management; and planting of water conserving crops. Payments would be made annually following documentation that such activities occurred. Unannounced random inspections could be included as part of the overall enforcement process. Do not feel wedded to any particular details at this stage in the program's development – you have good ideas, but you are also open to persuasion by others at the table.

Background Information on NoDrink

BED imposed a three-year moratorium on NoDrink that is due to expire six months from now and is under political pressure from environmental interest groups to extend the moratorium for five more years. However, we would like to propose approving NoDrink use under very tight restrictions: NoDrink barriers, no planting in certain regions where close relative plants are grown, and mandatory product labeling on all products made from NoDrink to provide consumers with the knowledge that their food is bioengineered. You are also open to other ideas from members of the Network.

To: Negotiator for CONSUME
From: Executive Board of CONSUME
RE: Instructions for the Summit

Background on CONSUME

As you know, CONSUME was established in 1956 to fight hunger in Pablo. We dedicate 80 percent of our private and foundation funding to food distribution efforts within Pablo and the remaining 20 percent to hunger relief program advocacy. CONSUME requires all its staff to work on hunger relief in the countryside. We believe that fieldwork sensitizes our staff to the problems of world hunger – starving faces are not easily forgotten.

Position on Sustainable Agriculture

If you have hungry people, you do not have sustainable agriculture. Too often, CONSUME has watched as hunger-alleviation goals are left out of sustainable agriculture discussions. Led by developed countries, sustainability debates often focus on environmental and economic goals exclusively. CONSUME believes that if agriculture is to be sustainable, it must fulfill the food and fiber needs of a growing world population.

Primary Perspectives

You have two primary perspectives going into the negotiations:

1. Most importantly, CONSUME is outraged that isolating dangerous water supplies is not on the Summit agenda. We must secure safe drinking water for Pablo consumers. Too much of our water supply is contaminated, resulting in a high mortality rate and sick children. You should demand that isolating contaminated water be added to the agenda. You are, however, open to other new ideas that may arise at the Summit.
2. Second, we are generally concerned about protecting and enhancing the ability of Pablo farmers to produce food. This means that you will want to fight to retain the rights of Pablo farmers to use Zine and NoDrink and any other technological tools that increase production. You are, however, open to other new ideas that may arise at the Summit.

Negotiating Notes

Compared to other participants at the Summit, CONSUME is relatively powerless. Too often our views are bypassed in these kinds of negotiations because we have so little leverage. Although we maintain some connection with international food organizations, like Bread for the World, for

the most part, our constituency is small and Pablo-based. We suggest one strategy to enhance your negotiating power:

- *Work in coalition.* Our hope lies in working closely with UNION, PAD, and TRADE during the course of the Summit negotiations. You may want to discuss a Pablo "package" of options that the four of you would support together.

General Background Information

Summit participants may be unaware of the dire food shortages faced by Pablo residents. You may want to share the following information in your negotiations:

1. *People are starving.* Pablo food assistance programs and international donor agencies are unable to meet Pablo food needs. Three out of every five Pablo borderland children go to bed hungry. Much of Pablo hunger remains hidden and therefore do not show visible symptoms until the deficiency becomes extreme. Many children under five years of age do not receive adequate protein and thus grow and develop poorly. They are sick most of the time, and, if deprived long enough, die.
2. *The world population is growing.* The world is adding the equivalent of one China's worth of people every 10 years, one Mexico's worth every year, and one New York City's worth every month. As a result, food needs are acute in developing countries like Pablo.
3. *Increased farm productivity is critical.* The hope for ending hunger in Pablo rests with increased farm productivity. To this end, technology is critical. Pablo needs better technology to make its farmers more productive – it is past time to make such investments.
4. *Poor people are moving to fragile areas.* According to the Overseas Development Council, six out of ten of the world's poorest people are being pushed onto ecologically fragile environments. In the absence of production aid and modern technological assistance, the Pablo poor have no choice but to work marginal land.
5. *Zine and other pesticides are necessary unless better options can be developed at the summit.* Worldwide, about 30 to 35 percent of the food crops are destroyed by pests, crop diseases, and weeds; another 10 to 15 percent are lost to pests and spoilage after harvest. Thus, each year pests and disease consume or destroy about 40 to 50 percent of the world's food supply.

Background on Isolating Water Contamination

CONSUME is concerned with the dangerous quality of drinking water. Many Pablo borderland residents cannot afford the fuel necessary to boil water before drinking and thus are forced to ignore advice from health authorities. Simple technologies such as capping portions of the aquifers with a layer of clay as well as extremely complex technologies such as trying to contain the contamination by installing physical barriers to alter the groundwater flow will protect existing water supplies from further degradation. A recent PAD study determined the cost of such an effort to be a one-time investment of \$13 million.

Background of NoDrink

The potential for NoDrink to help alleviate hunger is great in Pablo. You should oppose efforts to ban its use. NoDrink will save on water, reduce fertilizer need, and provide a nutritious soybean product. You may want to share the following information with Summit participants:

- *NoDrink is fertilizer.* NoDrink fertilizes the soil because it is a legume crop. Legumes leach nitrogen into the soil, thus reducing the need to apply fertilizers. If farmers practice crop rotations and rotate legume crops, fertilizer needs will be minimized.
- *NoDrink is nutritious.* Because the manufacturer of NoDrink wants Pablo farmers to adopt this technology and pave the way for other countries to follow by example, the price they charge for NoDrink seed has been set at a level affordable for most Pablo farmers. Thus, NoDrink will surely increase protein in the Pablo diets.

To: Negotiator for EARTH
From: EARTH Governing Council
RE: Instructions on the Summit

As you know EARTH was formed last year to provide a unified voice for the environmental community on border and water-resource issues. Our membership includes 23 Burford-based and six Pablo-based environmental groups. Prior to the formation of EARTH, few individual environmental groups had adequate resources to effectively engage in the borderland dispute. Coming together under EARTH has allowed groups to pool resources and develop joint strategies.

Position on Sustainable Agriculture

Chemical reduction is central to the concept of sustainable agriculture. Definitions and programs that merely set "safe and efficient use" as the chemical-use standard are unacceptable. These sorts of standards, promoted by agribusiness and farm groups who refuse to break the chemical habit, dilute the concept of sustainability to the point that it is useless. EARTH wants chemical reduction to be explicitly included in all sustainable agriculture programs and definitions.

Primary Perspectives

Our top objectives in this negotiation are to:

1. Restrict water withdrawals.
2. Ban Zine, unless new ways of regulating and using Zine emerge at the Summit.
3. Ban NoDrink, unless new ways of regulating and using NoDrink emerge at the Summit.
4. Establish a sustainable yield goal.
5. Stop any negotiated deal that allows expanded use of NoDrink in Burford, where it is now banned, unless new ways of regulating and using NoDrink emerge at the Summit.
6. Obtain NoDrink production controls in Pablo, where none now exist.

Negotiating Notes

Even though we are the sole voice for the environment in these negotiations and many are counting on us, we do not expect to win on every issue. Keep in mind that the public and media are very supportive of EARTH. You may want to remind Summit participants that they need us to help sell any "deal" made at this Summit to the people back home.

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- *Threaten a boycott.* Our membership is in opposition to NoDrink. If Summit participants are unwilling to support a borderland ban or at least severe restrictions on this bioengineered product, then EARTH will impose its own de facto ban. EARTH pledged prior to this Summit that it would urge consumers to boycott all farms and stores supporting NoDrink. You should tell Summit participants that we intend follow through on our threat.
 - *Support BED.* BED is our choice for an environmental regulatory agency. The Summit presents an opportunity for BED to obtain some control over Burford agriculture policy, thereby weakening the power of Burford's conservative agriculture department. This is a move EARTH welcomes, and, to aid this process, you should support BED in every way possible.
 - *Support financial aid for Pablo.* Our Pablo members are torn between their desire for a better environment and the reality of hunger within their country. On behalf of our Pablo members, you should support government assistance for Pablo farmers in order to increase produce and lower food costs.
-

Background on Water Clean-Up

Many herbicides (including Zine) cannot effectively be removed from drinking water by conventional treatment or more sophisticated carbon filtration systems. A 1987 study of treated water undertaken by the Iowa State Department of Natural Resources and analyzed by the U.S. National Academy of Sciences demonstrated the futility of water clean-up efforts. In this study, 10 herbicides were detected in treated drinking water in Iowa and Ohio. Researchers in Iowa found that 27 of the 33 public water supplies tested, or 82 percent, had two or more pesticides detected in treated drinking water samples; 73 percent had three or more; 58 percent had four or more; and 21 percent had one or more. While water reclamation efforts may remove some contaminants, they leave behind many others. Water clean-up efforts provide people with a false sense of security and are not a viable solution to the borderland water crisis.

Background on Zine

The data on Zine, distributed to all Summit participants, provides evidence to support your view that this chemical should be banned in the borderlands unless other regulatory and use options are developed at the Summit. Increased use of pesticides, particularly herbicides, over the past 40 years has greatly increased groundwater contamination. Industrialized agriculture is highly dependent on chemical and other inputs. As one industry spokesperson recently put it, in Burford, "we no longer grow food, we manufacture it." The consequences are clear: over 99 percent of citizens now have detectable amounts of suspected cancer-causing chemicals (including Zine) stored in their tissues. *The public wants and deserves pure drinking water, not water with government-approved pesticide contamination.*

Zine is a herbicide that is primarily sprayed all over the fields ("broadcast-applied") before planting and/or incorporated into seedling soil prior to planting. Like most herbicides, Zine is applied as an insurance measure to prevent any potential decrease in yields. Unfortunately, many farmers calculate that if one Zine dose kills pests then two doses will kill twice as many.

Alternatives to Chemicals

There are numerous techniques that farmers can practice to reduce or eliminate the need for toxic pesticides. Crop rotations are a well-known example and should be required of all farmers. In addition, you may want to discuss the following techniques to reduce Zine demand:

- *Ridge-Till*: Ridge-till systems prevent soil erosion and can reduce or eliminate the need for herbicides. A ridge-till cultivator is used to make ridges during the final cultivation of the crop. During spring planting, the tops of the ridges are knocked into the furrows. This reduces soil erosion by leaving the plant residue from last year's harvest on the soil. Ridge till can be very effective in all but sandy soils.
- *Cover Crops*: Winter grains such as oats, rye, and wheat have weed-suppressing chemicals in their roots, stems, and leaves. Farmers report that planting such crops in the winter and allowing them to decompose on the soil surface reduces weed pressure.

Background on NoDrink

Introducing a genetically engineered plant into the environment is always a dangerous act in your view. With NoDrink, you have three concerns:

- *NoDrink approval requires more data*. There are inadequate data as to how NoDrink responds in different weather and soil conditions. We have no long-term feeding studies to assess whether there are dietary effects.
- *NoDrink will increase chemical use*. The manufacturer of NoDrink advises farmers to use NoDrink in combination with a specially designed pesticide called Zoar. It is argued that the NoDrink-Zoar combination will produce the greatest soybean yields currently possible.
- *NoDrink may escape*. It is possible that the drought-resistant trait engineered into the NoDrink soybean could transfer to weed plants that are closely related to soybeans. The result would be super drought-resistant weeds. A 1990 study by American environmental groups found that at least 30 crop and forest tree species are now being purposefully modified to withstand otherwise lethal or damaging doses of herbicides. Those so-called herbicide resistant crops are being developed by the world's eight largest pesticide companies. These are the kind of things that make you hesitant to embrace biotechnology.

To: Negotiator for SUSTAIN
From: SUSTAIN Executive Board
RE: Instructions on the Summit

Background on SUSTAIN

As you know, the North Rhine Sustainable Agriculture Organization (SUSTAIN) is a non-profit organization that began 10 years ago. Our 400 members include organic farmers, farmers who produce food using little to no synthetic chemicals, as well as consumers concerned with food safety. Although SUSTAIN's current membership comes entirely from North Rhine, the executive board recently approved an initiative to seek members across Pablo. SUSTAIN's mission is to link farmers and consumers and to encourage farming practices that are economically, environmentally, and socially sustainable.

Position on Sustainable Agriculture

There are no quick fixes. Sustainable agriculture will only be achieved if farmers make significant changes in the way they farm. SUSTAIN members have already adopted crop rotations, tillage practices, and integrated pest management techniques that allow them to farm using few, if any synthetic chemicals. All farmers should follow SUSTAIN's example. Such practices are good for the environment and produce safer food.

Primary Perspectives

SUSTAIN has three primary perspectives going into this Summit:

1. *Production controls.* We would like to see some sort of production controls imposed on both Pablo and Burford farmers. SUSTAIN members have proven that it is possible to farm without excessive use of either synthetic chemicals or groundwater. However, inefficient irrigation in Pablo thwarted the efforts of many SUSTAIN members, who lost entire crops this season despite time- and resource-consuming water-protection efforts. SUSTAIN members have also had their products undercut in the market by Burford competitors who use agrichemicals and monocropping practices to produce larger crops at cheaper prices. At a minimum, we think that all farmers should be required to rotate crops.
2. *Research and education.* Our second priority is to encourage more research and education and ensure that it is farmer-friendly. Existing research and education programs are designed for large farms, focus on chemical management, and ignore the needs of resource-poor farmers. SUSTAIN believes that the most effective research and education programs are those based on a participatory model where farmers are partners in the

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program. To this end, SUSTAIN would like to be named a formal partner in new government research and education programs.

3. *Credit access.* Too many farmers, especially Pablo farmers, are denied the credit they need to make the necessary improvement to save water in the borderlands.

Negotiating Notes

Although SUSTAIN has been around for 10 years, this is the first time we have been invited to join a major network meeting and we want to be invited back. The bottom line: the Summit is our opportunity to make a good impression. It will be up to you to show off our expertise and to convince others that SUSTAIN should always be included in network meetings.

In addition to being a good resource on production methods, we advise you to pursue the following three strategies:

- *Address the concerns of FARM.* FARM contends that organic farming is a "hoax" and, if practiced on a large scale, will bring about mass starvation. We need to let policy-makers know that there is an alternative farmer organization to turn to for advice. Among other things, SUSTAIN members practice crop rotations and chemical restrictions, two Summit agenda items of concern to FARM.
- *Collaborate with EARTH.* Although we have had some skirmishes in the past with EARTH, EARTH staff have become more knowledgeable about farming methods and more reasonable in their demands. The Summit represents a great opportunity to work in collaboration and establish a strong relationship for the long term.
- *Secure business for SUSTAIN.* As stated earlier, we would like to receive contract work from any government entity to set up SUSTAIN in the role of educator, working directly with farmers on cooperative research and extension and, throughout, sharing the expertise we have developed over time. However, as you seek this role, remember that SUSTAIN remains a small organization. Do not oversell our capabilities.

Background on Organic Farming

Contrary to popular belief, most organic farmers have not regressed to agriculture as it was practiced in the 1930s. While organic farmers attempt to avoid the use of chemical fertilizers and pesticides, they still use modern machinery, recommended crop varieties, certified seed, sound methods of organic waste management, and recommended soil-and water-conservation practices. Organic farmers are able to reduce reliance on chemicals and to conserve water use by practicing, among other things, the following five management tactics:

- *Pheromone Techniques:* A pheromone is a chemical released by an organism that affects the behavior of another organism of the same species. Pheromones can also be used in a mass trapping mode where so many pests are lured into traps that their populations are reduced below damaging levels.

- *Biological Controls:* Biological control is any practice in which the survival or activity of a pest is reduced through the use of another living organism. Bacteria, viruses, fungi, predators, and parasites that attack pests are potential biological control agents.
- *Cultural Practices:* Cultural practices modify the physical environment in ways that reduce the attraction, survival, or reproductive capacity of pests and reduce synthetic fertilizer use and soil erosion. The most popular and effective cultural practice used by SUSTAIN members is crop rotation. Typically, SUSTAIN members plant an eight-year rotation of oats, alfalfa, corn or wheat, and soybeans. Cultural practices also include numerous preventive weed control methods such as reduction of the distance between rows and between plants in the row and mulching to smother weeds. Erosion is controlled commonly through the building of terraces, grassy waterways, and contour farming.
- *Host Plant Resistance:* Farmers can choose to plant crop varieties that have been either naturally or genetically altered to resist pests and withstand drought. For example, early-maturing corn varieties have been bred successfully in areas of unreliable rainfall, but relatively reliable, mid-season periods of rain. Quick germinating seeds and vigorous growing plants can be used to compete effectively with young weeds. Less vigorous plants may be transplanted to provide them a competitive advantage over weeds.
- *Irrigation Improvements:* New irrigation methods and practices can reduce evaporation during irrigation. These include installing drip tubing under plastic film, which has become a common practice on high-value vegetable crops, and installing drip tubing below the soil surface. New sprinkler systems now discharge water close to the crop or deliver water to furrows in drop tubes between crop rows, which reduce evaporation compared to spraying water high into the air.

To: Negotiator for FARM
From: Burford FARM Association Executive Board
RE: Instructions for the Summit

Background on FARM

As you know, the Burford Farm Association (FARM) has been in existence since 1922 and is the largest farm association on the continent. Our members include farmers, agrichemical companies, farm machinery suppliers, and wholesale food suppliers.

Position on Sustainable Agriculture

"Sustainable agriculture" has been practiced by Burford farmers for decades, evidenced by our ability to pass our farms down from generation to generation. FARM is concerned that some people believe mistakenly that sustainable agriculture means leaving the earth untouched. Agriculture, by its very nature, disturbs the natural environment. FARM also does not appreciate the anti-chemical rhetoric that often accompanies sustainable agriculture discussions. FARM believes that chemicals can and should be included as part of a sustainable system if used responsibly.

Primary Perspectives

We have two perspectives going into this Summit:

1. Generally, *we do not want additional restrictions* placed on farmers unless it can be demonstrated that they are in our best interests. We have to be convinced that things like mandated crop rotations will not jeopardize our commodity program payments as well as adversely affect production in the region. We also want Burford farmers to have reasonable access to NoDrink and Zine, two important production tools certain to increase yields. We are, however, open to other new ideas that may arise at the Summit.
2. Generally, *we do not like taxes*. Our membership has consistently called for reductions in the Burford federal government, where waste of taxpayer money is apparent. As it is, FARM members are riddled with debt and barely can make ends meet. If there are new taxes proposed, proponents have to demonstrate that they are in our best interests and that we are getting something out of it. We are, however, open to other new ideas that may arise at the Summit.

Negotiating Notes

We suggest several negotiating ideas:

- *Share data*. This memorandum includes data from the latest and most extensive survey

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of Burford producers regarding their farming practices.

- *Ask for additional research.* Farmers can only do what is possible – with more information, practices will change. Some ideas for the research community: replace synthetic chemicals with biopesticides; discover new solutions to soil nutrient needs; and generally, increase knowledge so that laboratory research can address more farm-specific problems. We are open to other new ideas for research that may arise at the Summit.
- *Review economic consequences.* Remind Summit participants of the importance of farming to economies on both sides of the border. Any action that makes farming more difficult is sure to cause hardship. Farmers do not want to lose income and no one wants food prices to rise.

Background on Commodity Programs

The Burford government established commodity programs in the 1930s to address the instability and risk associated with farming. These commodity programs are intended to support commodity (crop) prices, improve farmers' incomes, and to manage crop supplies. All farmers growing eligible crops are entitled to participate in farm programs regardless of income. Commodity programs reduce risk by providing an available market and a guaranteed minimum price for farm goods.

There are no statutory or regulatory barriers in the farm commodity programs that prevent farmers from incorporating crop rotations. However, farmers choose not to rotate crops for three reasons. First, the manner in which commodity crop yield payments are calculated encourages monocropping. Second, many of the crops that tend to be in diversified crop rotations, such as alfalfa, vetch, and small grains, have little market value compared to the crops characteristic of conventional systems, such as corn or wheat. Third, most farmers are greatly in debt and currently cannot afford profitability reductions that come with rotations.

Background on Burford General Accounting Office Survey

The Burford General Accounting Office (BGAO) released a report last month summarizing the finding of an extensive survey of Burford farmers. Perhaps the most important finding was that more than 90 percent of farmers believe that participation in the farm commodity programs is the best way to reduce economic risks. The BGAO found that if sustainable agriculture was shown to be profitable, farmers would immediately adopt it. Specifically the BGAO concluded:

"Since many macroeconomic, microeconomic, environmental, and agronomic factors influence farms' profitability, a significant amount of other research will need to be completed before it is possible to make general statements about the relative profitability of sustainable and conventional agriculture systems."

To: Negotiator for UNION
From: UNION Executive Board
RE: Instructions on the Summit

Background on UNION

As you know, the National Farmers Union of Pablo (UNION) has been the leading voice for Pablo farmers and ranchers since 1936. With the sole exception of TRADE, a Pablo-based agribusiness organization also represented at the Summit, UNION is Pablo's only national organization concerned with food production. UNION has more than 80,000 members. Unlike FARM (our Burford counterpart), most UNION members are small and relatively poor farmers.

Position on Sustainable Agriculture

You cannot have sustainable agriculture based on a few giant corporate farms. Food security, environmental concerns, and worker-safety reasons all point to small family farms as important in sustainable systems. But this raises an important issue: most technological innovations, which are critical to the development of sustainable agriculture, are rarely aimed at resource-poor farmers. Too many "sustainable" agriculture initiatives rely on expensive external inputs and thus are self-defeating. Rather, sustainable agriculture initiatives should be based on a combination of the old with the new ways of farming. For example, crop rotations might be combined with new bio-engineered non-toxic pest control methods. You are open to other ideas that may arise at the Summit.

Primary Perspectives

UNION is concerned that Summit participants will place new restrictions on Pablo farmers without providing the necessary resources to help poor Pablo farmers comply. In addition to protecting our members from incurring new expenses, we have three priorities:

1. First, we want to obtain cost-share assistance for irrigation improvements.
2. Second, we want to retain the right of Pablo farmers to use Zine or a reasonable substitute.
3. Third, we want to be fairly compensated by Burford for wrongful decisions in cases of border-rejected products.

Negotiating Notes

The following may prove helpful:

- *Dispute Burford's superiority.* The industrialized style of agriculture in Burford has

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many detrimental effects. For example, most Pablo farmers rotate crops. This practice should be adopted on all farms as it saves soil and decreases the need for agrichemicals. Also, the small family farm structure of Pablo agriculture supports rural communities while Burford's industrialized system does not.

- *Seek alliances with SUSTAIN.* SUSTAIN farmers do not share our views on the need for Zine and NoDrink. However, they do support crop rotations, and most of their members operate small family farms. We expect that SUSTAIN may best understand the production difficulties faced by our members. Consider alliances with others at the table, too.
 - *Establish Pablo Coalition.* Four Summit participants represent Pablo. We suggest that you try to work together to strengthen Pablo's voice at this Summit. We expect that PAD, CONSUME, and TRADE share many of our concerns. In a caucus prior to the official Summit, you may want to ascertain whether a common Pablo agenda can be constructed.
-

Background on Irrigation

Irrigation improvements are critical. As stated in the general instructions for Summit participants, the installation of proper irrigation systems on Pablo farms is of paramount importance. However, you question the cost estimates for irrigation improvements prepared by the Summit staff as too high, as they are based on construction of very large irrigation projects that are inappropriate for small Pablo farmers. Considerable evidence indicates that smaller projects have a higher potential for substantial returns than larger projects.

Another problem is that engineers focus almost exclusively on engineering designs for the physical systems. Distribution of water to farmers and subsequent maintenance are frequently not addressed. The success of an irrigation project depends largely on the active participation and cooperation of individual farmers, or what has been referred to as the "social infrastructure." UNION has undertaken considerable research on irrigation needs in Pablo. UNION concludes that *significant improvements in irrigation can be made at 40 percent less than the Summit cost estimate.* We have also found that many farms would benefit from installation of sub-surface drip irrigation systems. You are also open, however, to new ideas that may arise at the Summit.

Sub-Surface Drip Irrigation

The primary disadvantage of current irrigation practice is water loss through runoff, deep percolation, and evaporation. Agrichemicals can be transported to groundwater this way. Recent studies show that sub-surface dip irrigation (SSDI) has numerous potential benefits including water conservation, reduced herbicide use, and increased yields. SSDI systems allow water applications only in the area closest to the crop root system, conserving large quantities of water because less water is lost to evaporation and drainage. One study shows water savings for tomato production of 93%! By keeping the soil surface dry, SSDI prevents weed seeds between the rows from germinating, reducing the need for weed control.

Background on Small Farm Equipment Needs

Summit participants may be surprised to learn that one of the biggest problems confronting small farmers seeking to adopt more sustainable practices has to do with farm equipment being designed for very large farms. This problem is so extensive that even equipment as basic as tractors are often built only in sizes much too large for the average Pablo farm. Share this information with Summit participants. Your needs are different in many different ways.

Background on Zine

You see no reason to ban Zine in Pablo. If Governor Freeman chooses to remove this chemical from the market, he may do so. But he cannot impose the same ban on Pablo farmers. You should make the following points:

- *Pablo Zine Use Is Moderate:* We use a lot less Zine than Burford ever did due to the large number of farmers who employ one or more sustainable practices in conjunction with their use of conventional chemical practices. If used wisely and in moderation, Zine can be an effective and sustainable tool that limits the need for other toxic chemicals or harmful tillage practices that cause erosion.
- *No Reasonable Substitutes:* Governor Freeman suggests that there are available substitutes to Zine. While other chemicals may exist that provide similar pest-control qualities, the price for such products is well beyond the ability of Pablo farmers to pay. If Burford is really serious about this, financial assistance is needed.

To: Negotiator for TRADE
From: TRADE Executive Director
RE: Instructions on the Summit

Background on TRADE

As you know, the Trade Alliance of Pablo (TRADE) has been in existence for eight years, our members are manufacturers, wholesalers, and retailers of chemical pesticides and fertilizers, as well as the firms that handle, process, and export wholesale and retail farm products. Thus, TRADE represents Pablo agribusiness. Agribusiness not only includes the owners and managers of these agribusiness firms but also the individuals they employ. TRADE members represent a sector that provides nearly one-fourth of Pablo's gross national product and employment.

Position on Sustainable Agriculture

Like everyone else, TRADE is worried about environmental degradation – in fact that is one issue on which everyone at the Summit agrees. But placing restrictions on production in the name of sustainable agriculture is of concern to you. Before any such efforts are made, sustainable agriculture advocates must convince you of their assertions. Despite your concerns, you are open to new ideas that may evolve at the Summit.

Primary Perspectives

We have two primary perspectives going into the Summit:

1. First, we want Summit support for the establishment of a scientific panel comprising both government and private industry members to address and resolve disputes that occur when standards act as trade barriers.
2. Second, at the present time, we are against restrictions placed on Zine, a high-profit product for our members and essential for farmers. If restrictions are placed, they must be defensible and logical. If we lose money, a way to make up for our losses must be apparent.

Negotiating Notes

We have two negotiating ideas ... you may develop more:

- *Demand data.* Most importantly, ask appropriately tough questions and request data for all assertions made by our opponents. You are authorized to commit up to \$1 million from TRADE members to support scientific inquiries.

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- *Seek alliances with FARM.* We expect that FARM shares many of our same interests. Among other things, we assume FARM would like to regain the right to use Zine for Grady farmers. Remain open to alliances with others at the table.
-

Background on Trade Barriers

More than 25 times in the last two years, Burford officials have turned back Pablo imports at the border, claiming that harmful chemicals used in production had rendered these imports unsafe for consumption by Burford citizens but actually removing competitor products from the market¹.

There is little evidence that different environmental standards will lead to "pollution-haven" investments in Pablo as some have claimed. Pablo firms are not trying to circumvent health and safety standards. On the contrary, many Pablo firms are multinational firms that hold their subsidiaries to worldwide health and safety standards; such standards are usually at least as high as those in Burford. And, if a firm were to be motivated by a desire to escape Burford regulations, it would likely seek haven in one of the many surrounding countries that does not share Pablo's commitment to environmental protection.

Background on Pesticides

Banning or placing serious restrictions on pesticides involves a number of economic and social tradeoffs—real and perceived. Summit participants should look before they leap.

- *Environmental Consequences:* Reducing chemicals does not necessarily produce environmental benefits. It is estimated that a ban on Zine would result in a 10 percent increase in cultivated acreage as farmers plant more to make up for productivity losses due to chemical reductions. Much of this expansion would most likely occur on marginal land, which could lead to increased soil erosion. In addition to increasing sedimentation, land erosion could cause naturally occurring chemicals such as potassium and phosphorus to move with the soil into rivers and aquifers, resulting in reduced soil productivity.
- *Increased Food Costs:* Because Pablo's demand for food is largely fixed, even small reductions in production from reduced chemical use could result in proportionately large price increases. Without pesticides, it is estimated that low-income citizens in Pablo would be forced to spend 68 percent of their income on food. The loss of pesticides for soybean and rice crops has been extensively studied by Pablo university scientists. A ban on pesticides could cause soybean prices to double and cause exports to decline by 50 percent. A ban on pesticides could cause the real price of rice to increase by 83 percent, causing the export market to decline by 77 percent.

¹ TRADE became involved in a recent dispute of this nature. In this case, Burford rejected a large shipment of Pablo wheat at the border. The reason given by Burford officials was "detection of Dead-on residues". Dead-on is used to combat pests in Pablo but not in Burford. The reason for this is not because Burford has found Dead-on unsafe. Rather, it is because Burford does not have the same pest problems as Pablo and, therefore, does not require Dead-on. TRADE prepared a brief for Burford officials regarding this dispute in which we claimed that the rejection was an unlawful trade barrier. TRADE supplemented its argument with scientific studies supporting the safety and appropriateness of Dead-on use. We have not been notified with a final decision at this writing.

- *Food Loss:* If no pesticides are used, the quantity of corn, wheat, and soybeans in storage is estimated to decline by 80 percent; soybean yields could decline from 35 bushels per acre to 23 bushels; and rice yields could decline 64 percent.
- *Economic Hardship:* Pesticide reductions could affect the entire economy. This may surprise those who view agriculture narrowly as farming but not those who see agriculture as an important part of the nation's food and fiber system. If no pesticides were used in Pablo, the decrease in yields and higher prices could substantially reduce Pablo's competitive position in world trade, leading to a projected loss of \$2.3 billion of our GNP.

To: BIO Negotiator
From: Executive Board of BIO
RE: Instructions for the Summit

Background on BIO

As you know, BIO is a consortium of 72 biotechnology companies. Seventy percent of our members reside in Burford and 30 percent in Pablo. BIO was established in 1984 to provide a voice for the small struggling biotechnology industry. Our main task is to fight burdensome government regulation. BIO also monitors pesticide regulations because our largest members are agricultural businesses with both biotechnology and pesticide operations.

Position on Sustainable Agriculture

While not opposed to sustainable agriculture, BIO believes that emerging technologies will provide the answers to current environmental dilemmas in agricultural production. If we fail to exploit new technology, sustainable agriculture will never be realized.

Negotiating Notes

You are, of course, interested in securing favorable action concerning pesticides and biotechnology. However, for many of the issues, you do not have a strong position. This provides you a great deal of flexibility. *We expect you to enter into alliances with other parties as opportunities arise and to think creatively to solve these water quality and quantity challenges.*

Background on Biotechnology

You may want to remind participants of the value of biotechnology for the environment. In 1983 alone, the World Health Organization spread more than 500,000 pounds of a biopesticide across West Africa to control disease-carrying black flies. Now with biotechnology, scientists have been able to engineer the biopesticide into the corn plant itself. The corn plant emits it throughout its life, thereby warding off pests.

Background on NoDrink

NoDrink is a genetically engineered soybean plant designed to use less water than conventional soybean plants. As the first of many drought-resistant plants expected to enter the marketplace in the next two years, NoDrink is being watched closely by the biotechnology industry, government regulators and citizen activists.

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Fear of biotechnology led BED to impose a three-year ban on NoDrink. This ban expires in two and a half years. Already, opponents of biotechnology are lobbying Burford officials to renew the ban, saying that more data and analysis are necessary before large-scale plantings are permitted. In contrast, Pablo government officials have approved the use of NoDrink, and last year, for the first time, a small amount of NoDrink acreage was planted.

We expect that NoDrink's success or failure will have a great impact on future investment in the biotechnology industry. Therefore, it is in our best interests for government restrictions to be lifted.

Clearly, NoDrink is needed in the border region where rainfall is minimal and aquifer depletion is occurring rapidly. In support of NoDrink, we suggest you share the following information with your fellow negotiators:

- *NoDrink Saves Water:* Research trials have demonstrated that NoDrink plants require 40 percent less water than conventional soybeans. If planted on significant acreage, this will result in serious water savings for the region.
- *NoDrink Alleviates Hunger:* By surviving borderland drought conditions, NoDrink will have far greater yields than conventional soybean fields. As soybeans are a critical nutrient source in the borderlands, especially for Pablo residents, NoDrink will provide food for people and livestock well beyond current capacities.
- *NoDrink Substitutes as Fertilizer:* Soybeans are a legume crop. Because legumes leach nutrients into the soil, planting NoDrink is akin to applying fertilizer. Thus, use of NoDrink allows farmers to cut back on chemical fertilizers.

To help you counter opposing arguments, we suggest you consider the following arguments:

- *Fear of NoDrink Is Irrational:* There have been no problems with genetically engineered plants to date and there is no reason to expect problems in the future.
- *Scientists Always Speak with Caution:* It is typical of scientists to qualify their conclusions with statements like "Tests in greenhouses indicate..." or "Nothing in the literature leads us to believe..." This is how scientists are trained to think and communicate although it does frustrate the public in its search for definitive answers.
- *NoDrink Is Safe to Eat:* Aside from the drought resistance trait, NoDrink is identical to a conventional soybean plant in every way. Extensive laboratory tests have shown conclusively that NoDrink is safe for human and livestock consumption.
- *NoDrink Will Not Increase Chemical Use:* Opponents argue that NoDrink is more susceptible to insect damage and thus requires greater applications of pesticides. While the manufacturer does sell a special pesticide to use in conjunction with NoDrink, there is no evidence that its use will increase the use of chemicals in soybean production.

- *NoDrink Cannot "Infect" Other Plants*: Opponents argue that NoDrink will pass the drought-resistant trait onto weeds that grow in surrounding fields. There is no evidence of any genetic trait transfer as described, nor are the weeds in the border region close enough in relation to the soybean to allow for cross-breeding.

Of course BIO would prefer that no restrictions be placed on NoDrink, and this should be your goal. However, if approval is contingent on restrictions, then we suggest that you consider proposing the following items:

- *Increased monitoring and notification of officials if something goes wrong.*
- *Additional studies.*
- *Barriers*: Barriers take up land that could otherwise be productive, causing farm profitability to decline. However, if you find _____ that you are unable to talk your fellow negotiators out of barriers, we suggest that barriers be erected only on those fields where weedy relatives are known to be nearby.
- *Labeling*: Labeling of NoDrink products is the least desirable outcome. We fear a consumer boycott, led by EARTH, will scare farmers away from planting NoDrink even if all regulatory agencies say NoDrink is safe.

You remain open to new ideas that may arise during Summit negotiations.