Tribal Science Council
Risk Assessment/Health and Well-being Workshop
February 19 & 20, 2003
Albuquerque, NM

WORKSHOP SUMMARY

Background and Purpose

The TSC's Risk Assessment and Health and Well-being Workshop developed out of discussions relating to the priority Tribal science issues identified by the TSC Tribal representatives during the September 2002 meeting. The TSC identified as the top science priority the need for the integration of Tribal concerns into EPA's risk assessment and management process. Tribal science staff agree that current risk assessment and management methodologies do not take into account Tribal culture, values, and traditional lifeways. Additionally, Tribal science staff proposed a new risk paradigm for EPA's consideration; a paradigm focusing on human and ecological health and well-being, using that focus as the benchmark from which to gauge environmental quality risks.

In an effort to gain a better understanding of the issue and better insights into the ways in which EPA and Tribes view the current risk assessment process, the TSC formed a Risk Assessment subgroup. TSC Risk Assessment Subgroup members included: Pat Cirone, Michele Dineyazhe, Kesner Flores, Dan Kuznierz, John Persell, Sherry Sterling and Claudia Walters. In addition, the TSC identified as the subgroup's first action item to organize the Risk Assessment and Health and Well-being Workshop to bring together Agency and Tribal representatives to exchange information regarding risk assessment and Tribal lifeways. The objectives of the workshop were: (1) to gain an understanding of the risk assessment paradigm, as interpreted by each of the various EPA Program Offices, (2) to gain insights into the Tribal perspective on risk assessment and the Health and Well-being paradigm, (3) to seek commonalities between the two viewpoints, and (4) to identify how EPA ad Tribes can best work together to proceed with the issue.

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Overview of EPA's Risk Assessment Paradigm (Pat Cirone, US EPA, Region 10)

Pat Cirone provided an overall introduction to risk assessment at EPA. (See Appendix 1: Overview of EPA's Risk Assessment Paradigm) Her presentation included:

- An overview of the components making up risk assessment (i.e., toxicity, exposure, and risk factors);
- The uses of risk assessment;
- A history of risk assessment at EPA;
- The benefits and drawbacks associated with risk assessments; and

- An overview of the general risk assessment framework.

During Ms. Cirone's presentation, Rita Schoeny commented on the importance of understanding the complexity of risk assessment science, particularly as it relates to dose response modeling and the development of toxicity levels. She observed that risk assessment is part science and part art. As an example, she discussed the Agency's recent attempts to develop its updated Proposed Guidelines for Carcinogen Risk Assessment and provide additional flexibility to hazard assessment and characterization. For more information and to view the proposed guidelines, see: http://www.epa.gov/ORD/WebPubs/carcinogen/.

Ms. Cirone emphasized that risk assessment represents simplified methodologies that use mathematical models to generate risk data upon which policy decisions can be made. She noted that risk is only one factor that is included in the decision-making process, which also must be weighed with competing economic and political variables. Often policy makers and scientists are often at odds in risk assessment and management decisions, with decision makers seeking risk science with a highest degree of confidence to make the ultimate decisions over what is acceptable risk, often with incomplete data.

Following Ms. Cirone's presentation, several Tribal representatives expressed their concerns over the utility of the current risk assessment models in addressing Tribal needs and values. Patricia Cochran noted that current risk assessment models, for the most part, do not take into account traditional lifestyles and dietary patterns and the few that do, fail to take into account the long-term accumulation of toxics through long-term daily consumption of subsistence diets. Henry Lickers expressed concern over the lack of available funding for research into risk assessment studies relating to traditional lifeways and practices.

While agreeing that the current risk assessment paradigm does not adequately address the needs and concerns of Tribal communities, Kesner Flores urged workshop participants to remain open to the information being presented by the Agency, noting that the goal of the workshop discussion was to gain a better understanding of the current state-of-the-science and culture relating to risk assessment within the Agency to be able to better focus efforts and discussions on improving risk assessment in the future.

EPA Program Office Panel on Risk Assessment

Clean Air Act and Radiation Risks (Julie Wroble, US EPA, Region 10)

Julie Wroble provided an overview of the risk assessment paradigms relating to EPA's air toxics, hazardous waste combustion, and radiation programs. (See Appendix 4: Clean Air Act and Radiation Risks) Her presentation included an overview of the National-scale Air Toxics Assessment, an explanation of the hazardous waste combustion risk process, and a discussion of radionuclide risk assessment, as it compares to traditional chemical risk assessment.

Comprehensive Environmental Response (Jon Raucher, US EPA, Region 6)

Jon Raucher provided an overview of risk assessment as it relates to the Resource Conservation and Recovery Act (RCRA) and Superfund Programs. To provide a consistent risk assessment approach across the RCRA and CERLCA cleanup programs, states use the Superfund Risk Assessment guidance for RCRA corrective actions when they do not have their own risk rules in place. Risk assessment under RCRA and Superfund is unique in being focused at the facility level and is driven to determine site cleanup levels. Mr. Raucher's presentation provided an overview of site-specific baseline risk assessment, both human health risk assessment and ecological risk assessment. (See Appendix 5: CERCLA and RCRA Risk Assessments)

Office of Water and the Clean Water Act (Rita Schoeny, US EPA Office of Water)
Rita Schoeny provided an overview of risk assessment as it pertains to EPA's Safe Drinking Water Act (SDWA) and Clean Water Act (CWA) programs (See Appendix 6: EPA's Office of Water and Clean Air Act). She discussed the uses of risk assessment within EPA's Water program, most notably in developing drinking water standards and conducting benefits assessments under SDWA and in developing CWA criteria. She provided an overview of the use of human health risk assessments to develop Maximum Contaminant Level Goals (MCLGs) and Maximum Contaminant Levels (MCLs) under the SDWA. Ms. Schoeny spoke of the need to consider economic considerations when water quality standards are set, explaining that the Office of Management and Budget (OMB) reviews all regulations before they are promulgated and, as in the case of the arsenic standards, OMB will examine whether the benefits of the regulation in question are justified by the economic costs. In addition, Ms. Schoeny provided an overview of CWA criteria assumption considerations, such as those involving default fish consumption rates, noting that the criteria do not constitute rules and that EPA encourages states and Tribes to develop criteria based upon local conditions.

Federal Insecticide, Fungicide, and Rodenticide Act (Bill Jordan, US EPA Office of Pesticide Programs)
Although Bill Jordan was unable to attend the workshop, his presentation materials, providing an overview of risk assessment as it pertains to EPA's Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) program have been included in Appendix 7: Cumulative Risk Assessment—Organophosphate Insecticides.

Ecological Risk Assessment (Anne Sergeant, US EPA Office of Research and Development)
Anne Sergeant provided an overview of the ecological risk assessment process, providing a detailed comparison of human-health risk assessment and ecological risk assessment. (See Appendix 8: Ecological Risk Assessment) Ms. Sergeant again emphasized the difference in the roles of risk assessor and risk manager, the former in examining risk data and developing a discussion of risk, and the latter in utilizing the risk data to decide how the risk should be handled.

Cumulative Risk Assessment (Mike Callahan, US EPA, Region 6)
Mike Callahan provided an overview of the Framework for Cumulative Risk Assessment, which recently has undergone peer review and will be published by EPA in March 2003.

(See Appendix 9: Cumulative Risk Assessment) Mr. Callahan explained that the framework document, when compared to traditional guidelines published by the Agency, represents an informational document on cumulative risk assessment, rather than a description of how cumulative risk assessment should be conducted. Mr. Callahan listed a number of features differentiating cumulative risk assessment from traditional risk assessment, which included: a strong emphasis in stakeholder participation; discussion of multiple chemicals and stressors, including non-chemical stressors; a discussion of the vulnerability or influence of one stressor to change/affect risk for other stressor(s); an attempt to mesh both human health and ecology; and a population- rather than a contaminant-based approach. Mr. Callahan stated that after the framework is published, case studies will be utilized to determine its efficacy.

Following Mr. Callahan's presentation, Shawna Larson expressed some concern that Tribes had not been consulted during the development of the cumulative risk assessment framework, noting that the Federal government has a mandate to consult with Tribes on a government-to-government basis on issues that ultimately affect Tribes. Mr. Callahan noted that since the development of the framework began in 1999, the Agency has followed an open, peer-reviewed process, which included input from a number of outside groups, including the National Environmental Justice Advisory Council (NEJAC). Ms. Larson observed that consulting with the NEJAC is not a substitute for the government's responsibility to consult directly with Tribes on the issue. Barbara Harper questioned whether Tribal case studies would be utilized to test out the framework and whether government-to-government consultation with Tribes would be considered at future junctures in the framework development process. Mr. Callahan observed that the framework being developed represents a general scientific approach to conducting cumulative risk assessment and does not represent guidelines on how such efforts legally must be conducted. He emphasized that he would like the development of the framework to be as open a process as possible, noting that the document has been open for public review and comment, but that the period for public review has ended.

Following the presentations by the EPA representatives, Mr. Lickers identified various areas where EPA and Tribal communities are often at odds in terms of risk assessment science. He observed that the language used by EPA in the discussion of risk assessment issues creates friction within Indian Country, noting that the EPA risk assessment paradigm discusses human health as the most important factor, which contrasts with Tribal traditions which view humans as the "younger brother" in a holistic worldview. He expressed concern over the fact that the Agency speaks so loudly, clearly, and confidently on the science of risk assessment, noting that the Agency has only addressed and studied the issue for the past 30 years, while the Tribal community has been studying cumulative effects for thousands of years. He added that the Tribal communities have a wealth of information to share with EPA and that if EPA's science currently is not answering the pertinent questions involving risk assessment then the opportunity may exist for Tribes to offer their knowledge.

Patricia Cochran recognized that EPA has put forth more effort that other Federal agencies to work with Tribes but expressed frustration over the complexity involved in

addressing issues through the various Program and Regional Offices and various subcommittees, noting that a better process is needed to facilitate information exchange and cooperation across media, Program Office, and Regional Office issues. Kesner Flores noted that the National Tribal Environmental Council (NTEC) currently is looking to address this issue by convening a national organizational panel to educate Tribes on who the various Agency entities are, their history, and how they come together to work for Indian Country. He noted that the main concern for Tribes was not in solving intra-Agency communicational issues, but rather in taking their own lead in strengthening communication within Indian Country.

In regard to the TSC and its structure and function, Ms. Cochran observed that if the TSC is a Tribal process, then the Tribes should determine the organizational structure that would be most effective in communicating with Tribal communities. While Mr. Flores agreed with Ms. Cochran, he noted that part of the goal of the TSC Tribal representatives was to facilitate communication with the Tribes within their Regions to generate feedback from Tribal communities and grassroots organizations. He then provided a brief discussion of the history and goals of the TSC to further clarify the Council's actions with regard to facilitating communication between Tribes, the Regions, and EPA on Tribal science issues. Ms. Cochran concluded the discussion by voicing concerns over the lack of coverage of Alaska Native communities by the Agency, stating that having all the Alaska Native communities represented within Region 10 of EPA did not provide sufficient coverage of their needs.

February 20, 2003 – Risk Assessment and Health and Well-being Workshop, Indian Pueblo Cultural Center

Tribal Scientist Panel on a Health and Well-being Paradigm

Overview of the Health and Well-being Paradigm (Jeanette Wolfley, Shoshone Bannock)

Jeanette Wolfley, member of the Shoshone-Bannock Tribe's Risk Assessment Committee, provided an overview of the Tribe's Risk Assessment project and a discussion of risk from a Tribal perspective. (See Appendix 10: Overview of Health and Well-being Paradigm) Ms. Wolfley began by stating that the work EPA is conducting with regard to risk assessment is not new and that Tribes have observational and experiential knowledge with the issue dating back for centuries. She stated that the main concern of the Shoshone-Bannock Tribe is to protect and preserve their homelands and observed that the Federal government, through treaty obligations, has a special trust responsibility to preserve and protect these lands, a responsibility that is taken very seriously by the Tribes. She noted that EPA, with its Federal mandate to protect human health and safeguard the natural environment, has more responsibility than most Federal agencies in fulfilling this responsibility.

She began her presentation by describing the concept of risk, as perceived by the Shoshone-Bannock people. When compared to the traditional Western view of risk,

which can be defined as the "chance of injury, damage or loss," the Shoshone-Bannock Tribe's concept of risk is viewed in terms of healthiness and the interdependency of all living things. This concept is closely tied to the physical, mental, and spiritual well-being of all components of the universe and must, for example, include an evaluation of the role of risk in the social, linguistic, ecological, cultural, and traditional values of the Tribe.

Ms. Wolfley explained that consultation with the Tribe is vital, because the key to defining risk lies in defining what risk is from a Tribal community's perspective, noting that in such cases, the government-to-government consultation process is extremely important. When defining risk, Tribes are most concerned with the direct impacts of potential actions within the context specific to the community. Ms. Wolfley noted that Tribes and EPA are often at odds over the issue of risk because the Agency is largely media focused and driven in its efforts, while Tribes are most focused on context-specific issues that stress the interdependence of various risk factors.

Ms. Wolfley noted that the conventional risk assessment paradigm tends to ignore the impact of potential activities on Tribal culture. She noted that while cultural factors, such as the impact of a potential action on a Tribe's origin or creation story, landscapes, historical stories, songs, dances, prayers, language, etc., may not be easily quantifiable and are ignored by current risk assessment frameworks, these factors are vitally important to the continued health and well-being of Tribal communities and protection of treaty-reserved homelands.

In expanding the current Agency risk assessment framework to better incorporate Tribal information, Ms. Wolfley identified the following ways in which the risk assessment process can be better managed and organized, namely through:

- Identifying both resources and cultural attributes at risk;
- Defining both "risk" and "healthiness" from a specific Tribal community's context-specific perspective;
- Providing support in the decision-making process by demonstrating the full consequences of each potential risk decision;
- Developing a solid foundation and standard of truth for the risk assessment that is grounded in a Tribe's knowledge system and is based on direct observation and experience by Tribal members;
- Fostering acceptance of the risk assessment by the Tribal community through its development in a context-specific process; and
- Acknowledging that Tribes possess a culture-based knowledge of ecosystems and is part of the Tribal decision-making system.

She explained that in developing Tribally driven risk assessments, direct observational experience is needed, noting that in Tribal communities this type of direct observation, experience, and habitation, which is handed down by the generations, is held to be much more truthful than second hand knowledge, represented by the traditional Western science methodology of gathering and incorporating scientific data into reports. She noted that there has been a misunderstanding by individuals outside of Tribal communities regarding the credibility of the direct observational information that has

been collected by Tribal members. Tribal communities wish to gain acceptance of this traditional ecological information, which has been time-tested and verified for many generations. More over, Ms. Wolfley noted that, in the case of the Shoshone-Bannock people, this information has been documented through numerous Tribal historical records, surveys, and interviews. The Shoshone-Bannock people have anthropological data dating back to the 1930s and 1940s prior to the influx of industry into the area, which provides baseline information. Western science must begin to accept oral traditional knowledge of Tribal people to better inform the risk assessment process.

To provide "real-world" examples of ways in which the Agency can better coordinate with Tribes in survey and research efforts, Ms. Wolfley discussed an EPA-funded survey being conducted by the Shoshone-Bannock Tribe on observational data regarding water, land, and animal resources by Tribal members. The survey includes information on dietary habits and ceremonial uses of various animals, rocks, clays, and other materials. It utilizes interviews conducted with Tribal members, focusing on Tribal elders, conducted both in English and the Shoshone language. Ms. Wolfley explained the importance of conducting interviews in the native dialect of a given community, noting that the Shoshone language is much more descriptive than English when describing cultural issues, and that when Tribal members are interviewed in English, a great deal of information can be lost in the translation. She noted that while such surveys are highly time and resource intensive, they are vital in providing the context to understand risk management within a community. Ms. Wolfley stressed the need to spend the time and resources to understand unique Tribal cultures, noting that a one-size-fits-all model to risk assessment is ineffective. She added that it is vital to remember that among Tribes, there are very different cultural practices, traditions, and cultural stories in addition to various geographical and resource issues that come into play. An exposure scenario used for one Tribal setting is likely to be irrelevant and inapplicable to another Tribal landscape.

Ms. Wolfley ended her discussion by explaining that Tribes do not discount the technical information that EPA provides, but cautioned that this information must be considered along with Tribal cultural and lifeways inputs. When determining risk within a Tribal community, risk indicators can be identified, but these indicators should not be considered outside of the context in which the information was collected. This background information is vital to determining the level of risk to a community.

Following Ms. Wolfley's presentation, Patricia Cirone questioned how the Shoshone-Bannock Tribes presented the EPA-funded survey information so as not to jeopardize proprietary Tribal information. Ms. Wolfley explained that although EPA funding was utilized to develop the survey data, the information was collected under the condition that no proprietary information would be revealed to the Agency and/or produced as a product.

Ms. Smith asked Ms. Wolfley whether, as an attorney, she felt that any environmental law constructs are available that are more similar to the Tribal approach to risk assessment than, for example, CERCLA regulations. Ms. Wolfley noted that NEPA calls

for cumulative impact assessments, but it does not provide the protections needed by Tribes. She added that her Tribe has decided to move forward in trying to expand the current risk assessment process to better meet their needs rather than to proceed merely under a legal scheme because they felt that pursuing the matter through legal processes would not prove beneficial. Risk assessment is the foundation for many decisions made under the law.

Health & Wellness: Modern Problems and Ancient Solutions (Patricia Cochran, Alaska Native Science Commission)

Patricia Cochran, Director of the Alaska Native Science Commission, provided an overview of many of the environmental and health concerns currently facing Alaska Native communities. (See Appendix 12: Traditional Knowledge) In her presentation, Ms. Cochran explained that the worldview of Alaska Native communities is wholly different from other communities, noting that these communities have been raised to see the world (and, subsequently, the environmental and health issues that they face) "through a different set of eyes." She described the holistic nature of this worldview as encompassing physical, emotional, spiritual, and mental components and described the accompanying value system upon which the worldview was based. She stated that this worldview is a critical part of the native communities' Health and Well-being Paradigm.

Some of the key science and health issues ongoing in Alaska that Ms. Cochran included in her presentation were:

- Review of the Wellness paradigm. Currently, the Alaska Federation of Natives is developing a wellness program.
- Health. Health is the primary area of concern in Alaska Native communities, particularly as these communities are seeing an increase in cancer rates and social- and health-related problems.
- Traditional Knowledge. Ms. Cochran discussed the NativeKnowledge.org project, which brought together Alaska Native community representatives from all seven regions within Alaska to participate in a study looking at climate change and its effect on their communities. The study has been conducted using traditional talking circles, rather than researchers and survey teams, with care that information has been collected in the traditional way and with respect to those participating in the study. All information from the project is being documented on the Alaska Native Science Commissions Web site.
- Subsistence. The Alaskan Native community currently is working to refine the definition of "subsistence," as it is a difficult term for communities to grasp, having no translation in native dialects.

Ms. Cochran then provided an overview of a number of the current environmental and health concerns in Alaska Native communities, which included:

- Global Warming. Global climate change is a key concern for Alaska. Native communities are particularly concerned with such issues as changes in ice conditions, changes in species composition and migration patterns, and changes in wind patterns, which have necessitated the relocation of several Alaska Native communities. Ms. Cochran noted that as long as 30 years ago, Alaska Native

communities began recognizing the effects of global climate change in such examples as the inability to store meat in regions that previously had been cold enough to do so, changes in hunting and fishing patterns, and melting of ice fields that previously had been frozen year round.

- Abnormal Subsistence Foods. Alaska Natives have identified abnormalities and tumors on subsistence foods. Ms. Cochran noted that the Alaska Native Science Commission's Web site records first-hand accounts of such issues.
- Human Health. Alaskan Native communities are particularly concerned with increases in cancer rates within their communities, which they do not believe are linked to the rise in cancer levels in the general population. Many believe that the relative numbers of cancer incidents and the types of cancers being reported are associated with other conditions. Concerns exist over the numerous old military sites located across Alaska, where chemical and munitions relics from the cold war were buried, and the potential environmental impact the sites may have on surrounding communities.
- Local Sources of Contamination, which include mining impacts.
- Ecosystem Changes. Many Alaska Native communities are concerned over the impact of the large number of cruise and other ships entering Alaskan waters and the effect of their ballast and waste waters on the surrounding ecosystem.
- Perpetuation of Culture. Communities are concerned with their ability to transfer information to younger generations so that they will be equipped to deal with issues as they arise in their own traditional ways.

Ms. Cochran wrapped up her presentation by stating that she is not looking for EPA and other Federal agencies to solve the challenges facing Alaska Native communities. The communities accept the responsibility for the issues they face, but they are asking the Federal agencies to provide assistance in dealing with these issues.

Following her presentation, Mr. Gannon asked Ms. Cochran what suggestions she had for improving the TSC's responsiveness to Tribal science concerns. Ms. Cochran responded that the TSC should use tools derived from Indian Country to improve their outreach and organizational methods, most notably, she recommended the use of talking circles, rather than the traditional Western meeting style, to share and transfer information.

Claudia Walters asked whether any written documents are available describing the native world view and cultural components involved in the Health and Well-being Paradigm. Ms. Cochran was careful to note that no one-size-fits-all approach or model for risk assessment can ever be developed, as the Health and Well-being Paradigm incorporates a number of components, which a single model could not account for. However, she noted that a number of reports may be useful in elaborating on the paradigm, including the Alaska native Communities Report and materials related to the NFA Native Fed Web site.

Community Health Indicators (Henry Lickers, Mohawk Council of Akwasasne Environmental Division)

Henry Lickers, Director of the Haudenosaunee Environmental Task Force, began his presentation on community health indicators with a discussion of the Akwesasne's historical experience with risk assessment. (See Appendix 13: Community Indicators) Mr. Lickers described how Western science health studies conducted in 1978 showed contamination levels in local fish populations at levels that were determined to be too high for consumption. The Akwesasne community chose as a result of those studies to stop consuming the contaminated fish. Because the people had stopped consuming the fish, future health testing indicated no contaminant exposure in the population. However, the community was experiencing the subsequent collapse of political and cultural institutions, which had been dependent upon the subsistence fishing practices. In pointing to the experience of the Akwesasne, Mr. Lickers explained that risk assessments cannot be conducted in a vacuum; cultural, political, and economic indicators need to be considered within the assessment process.

Mr. Lickers went on to discuss what he felt were some of the myths surrounding traditional environmental knowledge. He disagreed that traditional environmental knowledge:

- Is only possessed by native peoples, noting that many French Canadians living within and around the Akwesasne Reservation have been living on the land for years and have traditional knowledge;
- Can be lost and needs to be saved. He observed that traditional knowledge can be stored all over the world in many ways. As an example he noted that the Akwesasne and a Seminole Tribe in Florida share culture and dances, which have been maintained for hundreds of years;
- Is stored in books and saved in books, noting that it is saved and shared by people;
- Is static. Change is inherent and is incorporated over time;
- Is more spiritual and mystical than factual and science-based. Mr. Lickers noted that innovations in environmental knowledge come from within and are derived from the spiritual;
- Is the same for all native peoples, noting that the traditional environmental knowledge held by various communities varies greatly based upon their historical, geographic, and cultural differences (i.e., communities based upon fishing, farming, and hunting and gathering lifestyles will vary greatly in their traditional knowledge base.)

Mr. Lickers explained that traditional environmental knowledge represents a knowledge base incorporating (1) innate, hardwired information that we are born with, (2) intuitive knowledge of how and why things are the way they are, and (3) empirical knowledge that is derived through experience and experimentation. He stated that spiritual knowledge derives from the reconciliation of intuitive and empirical knowledge, which results in better understanding.

Next, Mr. Lickers presented basic themes of naturalized knowledge systems, which included the following principles:

- The Earth is Our Mother;

- Cooperation is the way to survive;
- Knowledge is powerful only if it is shared. Mr. Lickers noted that Tribal communities have been exploited because of their knowledge sharing resulting from this principle.
- Responsibility (rather than laws, which provide only for the minimal requirements) is the best practice;
- Everything is connected to everyone;
- Place is important; and
- The Spiritual World is not distant from the Earth.

He observed that each of the themes identified feed into and provide a means of integrating information into the risk assessment process.
Mr. Lickers then presented a framework for understanding how to measure health and well-being as determined for individual communities through the development and use of "life indicators." Traditionally, Western science has defined the health of a community in terms of standard health indicators that measure death and dying (i.e., morbidity). Tribal communities are looking into ways to establish "life indicators" to measure the true health and well-being of their communities. Using a model being developed by the Assembly of First Nations called the Community Life Indicators Wheel, Mr. Lickers explained how particular life indicators that are representative of a given community can be identified. (A detailed description of the Community Life Indicators Wheel and The Assembly of First Nations Community Health Indicators project, can be found in Appendix 14: Mohawk Council of Akwesasne, Community Health Indicators, Changes in These Indicators and the Analysis of Risk to Social Structures and Cultural Practices) By using the Community Life Indicators Wheel, individual health indicators that are representative for an individual community can be identified.

He concluded by identifying several issues that must be considered when developing indicators for Tribal communities:

- The index being used to develop the indicators must provide hope (i.e., not be a measure rates of mortality, suicide, etc.). Negative variables must be changed;
- The needs of the individual community in question must be identified;
- Traditional Western economic variables must be replaced with "economic" variables of consequence to Tribal communities (i.e., number of moose hunted)

Following Mr. Lickers presentation, Ms. Smith asked whether he felt that there could ever be successful sustainable urban environments. Mr. Lickers remarked that such efforts are difficult and at their core must focus on an examination of personal human responsibilities (in juxtaposition to legal mandates) to rethink cities. However, he indicated that there were changes that could be made to make urban environments more sustainable and livable, citing urban renewal and urban park development projects, the existence of which he noted could transform societies.

Pat Cirone questioned whether Mr. Lickers felt that, in the context of the discussion on risk assessment and management, environments could ever be restored to their natural states. Mr. Lickers responded that while a degree of restoration could be achieved, one

can never take an area back to its pristine state, adding that it is impossible to live upon the Earth and not modify it.

Panel Discussion of the State-of-the-Art Practice of Applying Tribal Exposure Scenarios to EPA's Risk Assessment Paradigm

All Indian Pueblo Council's "Incorporating Tribal Cultural Values Into the HRS" Initiative (Margaret Chavez, Santo Domingo Pueblo)

Margaret Chavez, who worked with the All Indian Pueblo Council (AIPC's) Pueblo Environmental Office, provided an overview of AIPC's efforts to examine EPA's Hazard Ranking System (HRS) and identify methods for better incorporating Tribal cultural needs and values. Ms. Chavez noted that the effort arose out of concern on the part of the pueblos in the area over the inability of Superfund to address investigation and cleanup at Pueblo sites.

To examine and address this issue, AIPC partnered with EPA to develop a pilot program to examine AIPC sites using the HRS process and examine ways to better incorporate Tribal values into the system. Of the 53 pilot program sites assessed and scored by AIPC under the HRS process, none ranked high enough to be placed on the National Priorities List. Moreover, Tribal concerns and issues had not been considered in the scoring process.

Ms. Chavez explained that the Pueblo lands are typically located in remote areas and, therefore, do not demonstrate significant impact under the HRS scoring system; however, Tribal members often gather plants and hunt in remote areas, and, therefore, frequently come into contact with pollutants in the surrounding environment.

To better incorporate Tribal cultural values within the HRS scoring package, the AIPC examined EPA quantification models as a guide to determine ways to factor in Tribal-specific resources. By doing so, the AIPC demonstrated that they could affect large increases in the HRS ranking numbers.

Ms. Chavez concluded her presentation by explaining that the project remains unfinished. The goal of the AIPC to have the sites in question assessed and/or cleaned up remains unresolved. However, Ms. Chavez reported that the AIPC learned a great deal through the process and feels that they had the opportunity to educate the Agency a great deal about Tribes, their needs, and how to better work with Tribes through the process. She is also proud of the attention and interest that has been expressed regarding the pilot program.

Following Ms. Chavez' presentation, Mr. Charters questioned how the HRS process could be altered to better include Tribal cultural concerns and values. Ms. Chavez responded that the goal of the AIPC is not alter the HRS process, which would necessitate a change in law, at this time. She stated that the Tribe does not have the time to engage in such an undertaking. Rather, their goal is to examine the existing HRS framework and determine ways of incorporating Tribal cultural values into the HRS scoring process.

In response to a question by Ms. Walters regarding whether any of the AIPC's efforts to review and recommend cultural considerations to the HRS had been documented, Ms. Chavez reported that while reports documenting the AIPC's first two years of work on the issue were developed, this information has not been released to the public. One of the AIPC's stipulations in working on the project was that all information generated as a result would need to be reviewed and approved by Pueblo Tribal elders prior to public release, and this, at present, has not occurred. However, she noted that within EPA, Ladona Walker and Susan Webster of EPA Region 6 did possess information, mostly consisting of how the Tribe got started on the project, and could be contacted for additional information.

Human Health Risk Assessment as a Major Contributing Factor to Remedial Alternatives for the Lower Grasse River, Massena, NY (Jessica Jock, St. Regis Mohawk Tribe Environmental Division)

Jessica Jock, an environmental technician with the St. Regis Mohawk Tribe Environmental Division, discussed baseline human health risk assessments that were used to determine remedial alternatives for the Lower Grasse River system located on the Akwasasne Reserve. (See Appendix 15: Human Health Risk Assessment as a Major Contributing Factor to Remedial Alternatives for the Lower Grasse River, Massena, NY) Ms. Jock pointed out that the risk assessments conducted by local industry and approved by EPA pushed for a remedy without taking into account Tribal concerns and plans for Tribal involvement. Examples provided by Ms. Jock highlighting instances in which Tribal concerns were not taken into account, included the lack of data on consumption rates for women of childbearing age and the limited focus of the assessment, which included data only on limited stretches of the river system and limited data to only two fish species that were not considered the most important fish species by the Tribal community. Ms. Jock also noted that it was uncertain whether or not an adequate ecological risk assessment had been undertaken for the site, particularly one that portrays the intricate effects of contamination on the surrounding area.

During Ms. Jock's presentation, Mr. Lickers expressed frustration over the difficulty Tribes often face in getting EPA to accept and validate outside data. He noted that in regard to a 1980 epidemiological study commissioned by the Tribe, questions were raised by the Agency over the validity of the study results. Mr. Lickers emphasized that Tribes are most interested in gaining the best scientific information available, regardless of whether it meets the Agency's proscribed standard. He argued that good science will stand up to disagreements in the state and Federal arenas. Mr. Callahan remarked that EPA guidance stipulates that if better data exists and can be validated, then it may included in the assessment. There was general consensus from those present that, in practice, this often was not the case.

Ms. Cochran provided her own perspective on the issue of fish and consumption advisories, noting that these advisories often are not relevant for Alaska Native communities, where community members may rely on a 90 percent subsistence foods diet with no alternative for food sources available. Efforts currently are underway in the

Alaska Native community to combat these advisories to ensure that Tribal cultural and health considerations are made.

Mr. Lickers expressed concern that the focus of risk assessments must be broadened to include more than just a single contaminant. He observed that the health effects of background levels of multiple chemicals that exist in quantities that are right at the contaminant limit, while lawful, may pose considerable health risk and need to be addressed.

Following her presentation, Ms. Jock questioned how she, in her role in working with the Tribe's environmental department, could incorporate the Health and Well-being paradigm into her work. Ms. Cirone remarked that efforts should be focused through negotiations and increased communication on risk issues. However, she noted that such communications efforts often slow down the process of risk assessment and mitigation and that one must balance the need to act on the information that is currently available or continue to debate and research the numbers and wait for agreement on the issue.

Ms. Sergeant stated that ecological risk assessment is useful in such cases in allowing communities to develop a planning process and to discuss the outcomes that they are seeking in the cleanup and remediation process. Such planning processes allow communities to take the time to identify what their goals are. Mr. Lickers expressed some concern with this approach, noting that Tribes are reticent to commit early in the assessment process to the outcomes that they are seeking, as they may be held to these numbers in the future.

St. Regis Mohawk Tribe's Efforts Regarding Natural Resource Damage Assessment (Barbara Tarbell, St. Regis Mohawk Environmental Division)

As an extension of Ms. Jock's presentation on risk assessment at the St. Regis Mohawk Reserve, Barbara Tarbell, of the St. Regis Mohawk Tribe Environmental Division, provided an overview of the Tribe's efforts to complete a Natural Resource Damage Assessment (NRDA) to identify how and to what extent the culture of the Mohawk people has been affected by injuries to the natural resources as part of its ongoing Superfund actions. Ms. Tarbell explained that the Tribe is using its own funding to collect information for the NRDA on the interaction of the Tribe and their natural resources. The Tribe currently is in a protracted negotiation with the contaminating companies to come to agreement on the anthropologists that the Tribe will use to conduct the NRDA studies.

Santa Clara Pueblo's Experience Regarding TCE/PCE Cleanup (Dino Chavarria, Santa Clara Pueblo)

Dino Chavarria of Santa Clara Pueblo's Office of Environmental Affairs provided an overview of the Tribe's experience in coordinating with the New Mexico Department of Environmental Quality, EPA Region 6, and the City of Espanola in assessing and cleaning up contamination from a TCE/PCE plume. The plume had migrated onto Pueblo lands, originating from a source located on the exterior boundary of the nearby City of Espanola. Although the Tribe was brought to the table late in the game, 10 years after the plume was first discovered, the Tribe has worked in coordination with the partnering

entities to achieve the common goal of cleanup. Mr. Chavarria offers the Tribe's experience to serve as a model to EPA and States in working with Tribes. Through the Tribe's efforts to be involved in the assessment process, it solicited funding from EPA Region 6 to conduct an assessment of the plume. Through urging by the Tribe, the DEQ was convinced to conduct additional investigation of the plume, and specific Tribal concerns were included in the Record of Decision for the site.

Traditional Lifeways, Eco-Cultural Systems, and Tribal Exposure Scenarios (Barbara Harper, AESWE, and Stuart Harris, Confederated Tribes of the Umatilla Reservation)

Barbara Harper and Stuart Harris provided a presentation on Tribally relevant risk assessment practices and exposure scenarios, based on a Tribal worldview that healthy people and a healthy ecosystem are inseparable. (See Appendix 16: Traditional Lifeways, Eco-cultural Systems, and Tribal Exposure Scenarios) The presentation highlighted the need to expand the conventional CERCLA risk assessment approach to become more like the comparative risk and NEPA approaches. The human health risk assessment approach needs to be more like an ecological risk assessment, with people integrated into the ecology. They reported that if aspects of traditional lifeways and risks to the cultural ecosystem are included, the risk assessment will also have a public health appearance, where "health" is understood to be comprised of an individual's and community's well-being with their lives fully integrated into a healthy ecosystem. During the presentation, Mr. Harris and Dr. Harper made the following points:

- The current EPA methodology for CERCLA and media Acts (CAA, SDWA, CWA) are geared toward single media, single contaminants, and single pathways, rather than being cumulative. If CERCLA were more like NEPA and comparative risk, and if human health risk assessments were combined with ecological (or eco-cultural) risk assessments, then a cumulative (or holistic) method that reflect Tribal perspectives and traditional lifeways could be achieved. They noted that CERCLA does not prevent this; it simply has not been done.

- A one-size-fits-all approach is not possible, given that each Tribe lives in its own eco-cultural system. However, some exposure factors are applicable to all active, outdoor lifestyles and should be used as default exposure factors along with regional ecological dietary pathways until site-specific or Tribal-specific exposure factors can be developed. These exposure factors (in particular, 400 mg/day soil ingestion, 3 L/day water ingestion plus 1L per use of the sweat lodge, and 30m(3)/day inhalation rate) have been researched and published but are not used by EPA. Traditional fish ingestion rates are much higher than EPA realizes, and subsistence diets need more attention (It was noted that Mr. Harris and Dr. Harper are doing research in this area).

- There is a disconnect between EPA Headquarters and the Regions (and individual project managers) on how Tribal risk assessments should be conducted, often leaving individual Tribes fighting with EPA on their own. This divide-and-conquer approach should be stopped.

- The funding made available for Tribes for risk assessment is woefully inadequate and inconsistent.
- Tribes frequently do not fully grasp their regulatory situation and the implications of ARARs and NEPA/CERCLA/NRDA processes on the risk assessment methods and associated data collection.
- Mr. Harris and Dr. Harper have been working with EPA for almost 10 years on holistic Tribal risk assessment methods that reflect traditional lifeways. While there is clearly much more understanding within EPA, basic "fixes" have not been implemented and are side-railed into non-regulatory projects that EPA does not have to apply on the ground. For this reason they are seeking policy-level changes as well as methodological improvements.

Following Ms. Harper and Mr. Harris's presentation, Mr. Callahan expressed concern over casting the risk assessment process in the role of villain. He noted that Ms. Harper had indicated that there are examples of risk assessment methodologies that exist that would be adequate and applicable to Tribal needs, and suggested that these examples should be used to build from. Mr. Harris agreed that the larger problems in risk lie not in the process of risk assessment but in the process of risk management, where larger political and economic factors come into play, observing that increased open communication on risk needs to continue.

Mr. Etsitty agreed that communication is a key issue in improving the risk assessment process, indicating that he has been working with EPA's Office of Prevention, Pesticides, and Toxic Substances (OPPTS) to bring in Tribal representatives to discuss the various cultural processes, such as weaving and pottery making, and dietary practices in order to better educate the Agency's decision makers on Tribally related practices that go into influencing risk assessment decisions in Tribal communities. He offered his efforts as an example for opening up communication with the Agency on the issue of risk.

Discussion then focused on the inability of default values to adequately account for Tribal lifeways and practices in exposure scenarios. Ms. Cirone noted that, in general, the scientific community cannot be expected to agree on the default values that are utilized in risk assessment, and scientific debate over these values will continue to occur. However, she observed that this was a separate issue from whether and how to incorporate Tribal health and well-being indicators and values into risk assessment processes. Ms. Larson expressed frustration over the degree to which the scientific community debates the results of the science behind risk assessment values, observing that such efforts do not address the key issue of how to protect communities from exposures in the first place.

Ms. Wolfley expressed concern that the development and use of default values based on exposure scenarios for a particular Tribal would become the 'Tribal default values' that would then be plugged into risk assessment scenarios for all Tribes. She reported that the Shoshone-Bannock Tribes have experienced problems with this, dealing with a contractor that wished to utilize the default values developed by Barbara Harper and extrapolate them for the Tribes' risk assessment. She asked that it be made explicit that the default

values generated for one Tribe not be generalized for all Tribes. Mr. Harris agreed, urging the Agency to take the time to go through the full risk assessment process with each Tribe.

Discussion of the Commonalities between EPA's Risk Assessment Paradigm and the Health and Well-being Paradigm and Future Activities and/or Products

Mr. Lickers reminded the group that in order to have a productive discussion of the commonalities between EPA's risk assessment paradigm and the Tribal Health and Well-being Paradigm, steps must be taken in ensure a balanced participation. He observed that the following elements are essential in ensuring a balanced and productive discussion of risk assessment:

- Respect – To ensure a respectful discussion, the following tools be are needed: understanding, communication, consensus, mediation, and honor;
- Equity – To ensure an equitable discussion, a balance of the following: finances, knowledge, networks, personnel, and social power is needed; and
- Empowerment – To ensure a balanced and meaningful discussion, participants must be assured application, authorship, credibility, partnership, and joint responsibility.

He observed that respect, without both shared equity and empowered participants, cannot ensure a balanced discussion of an issue. The following chart depicts the elements necessary to ensure a balanced and productive discussion:

RESPECT	EQUITY	EMPOWERMENT
Understanding	Financial	Application
Communication	Knowledge	Authorship
Consensus	Network	Credibility
Mediation	Personnel	Partnership
Honor	Social Power	Responsibility

The Council then tried to identify how the group should proceed on the issue of risk assessment and the health and well-being Paradigm and tried to identify commonalities between the two that should be included in development of a future paradigm.

Mr. Young cautioned the Council against rushing to implement a solution. He observed that Stuart Harris had stressed the importance of taking the time to understand the context of a situation and the Tribe and its particular sensitivities before attempting a solution. Mr. Young observed that the Agency's cultural norm involves wanting to move forward to address a problem and cleanup a site, noting that it is often difficult in such a climate to slow down to examine the complexities of the situation in question. He noted that this often creates tension with Tribes, which may be functioning on a longer time scale and

may not wish to rush into implementing a solution. Mr. Kuznierz agreed, noting that any Risk Assessment/Health and Well-being Paradigm that is developed should recognize the need for flexibility regarding the different cultures, exposures, and lifestyles that may be involved.

Norm Dyer observed that the group should consider that there are two approaches to addressing risk situations: (1) cleanup of existing exposures and (2) prevention of potential future exposures. He stated that an approach utilized in the U.S. Department of Health and Human Services (HHS) Healthy People 2010 initiative focuses on the second preventative approach to identify and prevent potential exposures, thereby, eliminating future health impacts. During the TSC Business Meeting, which was held on February 21, 2003, Mr. Dyer presented an overview of HHS's Healthy People 2010 initiative. A description of his presentation can be found in the TSC Business Meeting Summary.

The Council then discussed the need to develop risk assessment default values that are more applicable for Tribal communities. Mr. Kuznierz observed that default values should be replaced by the best available data and questioned what legal constraints would prevent Tribes from moving forward with this. Ms. Schoeny responded that, in the past, the default values were considered the standard, and only if additional data was available would it be potentially be used to expand on these default values. However, she noted that new efforts by the Agency, such as the promulgation of the new cancer risk assessment guidelines, is now recommending that all available data be used first, and that risk assessors use default values only in cases where sufficient data is otherwise unavailable. Ms. Cirone added that there was no rule by EPA stating that the default values must be followed.

Ms. Cirone also reminded the group that they must recognize that risk assessors and risk managers function as two entirely separate entities. While risk assessors may develop the data and run the risk scenarios, it is the risk managers who must make the policy decisions on how the risk will ultimately be managed. Risk scenarios that are impractical or cost prohibitive ultimately will not be implemented, even if they are physically and scientifically feasible. She remarked that risk assessment is not the ultimate answer to risk questions, it represents only an analysis of the available risk data. Ultimately, decisions will be needed as to how meaningful, useful, and true to a culture the information presented is.

Ms. Walters observed that the proposed Health And Well-being Paradigm is a new concept for the Agency. Up until this point, EPA's focus and approach has always been risk assessment. The approach has not been preventative in nature. She emphasized that effectively communicating the paradigm to EPA is vital, and, therefore, a written record of the paradigm is needed.

Mr. Kuznierz noted that the TSC needs to develop a strategy for dealing with the two paths identified during the September TSC meeting: (1) the long-term process to develop a Health and Well-being Paradigm and (2) the short-term focus of expanding the current risk assessment framework. He noted from a personal perspective, that he is having

trouble envisioning where the two paths come together. Mr. Persell indicated that he was more in line with moving forward to develop the Health and Well-being Paradigm, given that the Agency is going to continue risk assessment framework.

Ms. Wolfley wished to emphasize that in developing risk assessment information, it needs to be understood that Tribal science is just as valid as EPA's information, meeting or exceeding EPA standards. She indicated that in opening up the current risk assessment framework and in developing the Health and Well-being Paradigm, she would like to see institutional risk managers, technical risk assessors, and community-based cultural representatives all included in the process, and all with equal weight in the decision-making process.

Mr. Lickers observed that no one intends to go out and do bad science or bad risk assessment, but that risk assessment and management involve process discussions, which are heavily influenced by empowerment issues. Therefore, he asked, why not empower and support those doing improved default research and those asking the right questions to develop better risk assessment? To this end, Mr. Lickers proposed that the TSC might consider pulling together experts to develop a paper on the default concepts explaining why those default values do not work for many communities. He suggested that case studies could be developed. He noted that care should be taken in constructing such a paper to be respectful of all of the people at the table trying to understand the problem of default values and to be cognizant of the equity issues involved in the debate. Mr. Kuznierz expressed some concern over the result that Tribally developed default values could pose, namely, that the default values developed for a particular Tribe under a particular set of conditions could be construed as being 'the Tribal default values example' which would them be factored into all future Tribal risk assessments.

Mr. Callahan remarked that such an effort to develop alternative default values using Tribal scenarios was likely to be successful within the Agency and would be of great help as comparison values by which to evaluate current risk assessment default values. There was some discussion over the potential for developing a default value range for EPA, given that there were no "one size fits all approach" scenarios within risk assessment. Mr. Charters cautioned against this approach, noting that if a range of values is proposed, in reality, only the high end values will ever be utilized. Mr. Charters agreed that collecting data on default values was important but was skeptical over the possibility that EPA would accept the default values developed.

Mr. Charters stated that he was inclined to expand the current risk assessment paradigm rather than tear it down in favor of a new paradigm. He recommended developing a communications process to educate policy makers on ways in which the current system is inadequate and structure discussion to develop ways to improve the current risk assessment processes. Mr. Gannon observed that he would like the TSC to consider assisting Tribes in finding ways to develop their own Tribal default values on an individual Tribal community level so that they can design their own risk assessment processes.

Ms. Sergeant noted that risk assessments are often conducted for a variety of reasons and that the communities involved often have differing expectations going into the process. Therefore, she recommended that an upfront discussion be developed going into the risk assessment process in order to discuss why the risk assessment is needed and to look at the range of possible risk assessment and management possibilities available to a given community.

In response to Mr. Charters' comments, Mr. Persell felt that the TSC should act in the most effective way to change policy on the issue of risk assessment. He suggested the development of a subcommittee to follow up on the issue and determine how best to impact policy decisions by the Agency on the subject. He recalled from the September TSC meeting that amending the current EPA risk paradigm to protect Tribal members is an ongoing undertaking, working with real-time contaminant issues. This must continue unabated. The Tribally proposed health and well-being paradigm is a second TSC initiative, distinct from Tribal efforts to amend the current EPA risk processes, at least for now. The timeframe for the potential acceptance and implementation of the health and well-being paradigm is longer term, perhaps five to ten years ahead.

Ms. Schoeny noted that one of the big hurdles to getting such policy moved through the Agency lies in being able to quantify the benefits of policy decisions to EPA's Office of Management and Budget (OMB), noting that OMB holds great sway over policy implementation at the Agency. Speaking from her experience with getting the Arsenic regulations passed, she stated that it was imperative to be able to demonstrate the benefits of a particular policy option in quantifiable, measurable terms in order to generate OMB buy in. She added that only if it can be proven to the managers that the proposed policy change is workable and viable will it move forward within the Agency.

In response to the discussion, Mr. Lickers suggested that the TSC consider developing a request for proposals (RFP) for Tribal entities dealing with default values issues. Ms. Cochran expressed concerns that Tribes would not respond to such an RFP. Along those lines, Mr. Young recommended that the TSC develop a solicitation calling for Tribes to tell their stories relating to health and well-being. He remarked that he liked the idea of using talking circles, which Patricia Cochran had mentioned earlier in the day's discussion. Discussions regarding a potential call for proposals relating to the Health and Well-being Paradigm were continued during the TSC Business meeting held on February 21, 2003, and a report out of that discussion can be found in the Business Meeting Summary.

Tribal Science Council
Risk Assessment/Health and Well-being Workshop
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Albuquerque, NM

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