Group Goals, Group Peace:
The influence of superordinate goal-focusing on intergroup conflict and understanding in a case of mining conflict

Evan B. Forward

Thesis for undergraduate independent study at the University of Vermont

Supervised by

Dr. Saleem H. Ali
Environmental Studies Program

&
Larry Rudiger
Psychology Department

December, 2007

Table of Contents

Abstract

Conflict is frequently exacerbated by stakeholder misperceptions (Chambers 2006). Rivals tend to exaggerate the difference between their personal priorities and the priorities of their opponents, which in turn, discourages efforts to reach mutually beneficial solutions (Keltner and Robinson 1996). One way to correct this problem is through a process that focuses interested parties on a common goal (Sherif 1954). Various Vermont stakeholders have engaged in intermittent litigious conflict for nearly two decades with the Swiss transnational mining company OMYA Inc. In January 2006, Conservation Law Foundation Ventures(CLFV), convened an advisory committee comprised of six major stakeholder groups and began a process of building consensus on the methods for studying the environmental impacts of OMYA's mineral processing operations. The overarching purpose of the process was to ensure fairness and neutrality in studying environmental issues related to OMYA's processing facilities. This common goal transcended the individual priority systems of all stakeholders involved. Using an experimental survey method, I determined that participants in the CLFV process more accurately judged their opponents priorities than the control group. Furthermore, they reported lower actual conflict than the control group. These results are consistent with the theory that a process that focuses on common goals reduces misperceptions and in turn, conflict.

Literature Review

We are constantly making judgments as we interact in society. “He wants to shake my hand”, “she wants money”, and “he needs help” are all examples of the myriad commonplace judgments that we use to inform our strategies and actions in social life. The way in which we integrate information to construct our interpretations of others’ needs and priorities is described as our judgment policy in social judgment theory literature (Stewart and Gelberd 1976). The formation and evolution of judgment policy is a fundamental component of conflict as it is through this process that we perceive the goals of others and assess their compatibility or incompatibility with our own. Sandole defines conflict as a process, “ . . . in which at least two actors or their representatives, try to pursue their perceptions of mutually incompatible goals by undermining, directly or indirectly the goal-seeking capability of one another” (Sandole 1993). If our judgments are correct, then the competitive dynamic suggested by this definition is an appropriate strategy for furthering our self-interests. However, if our judgments are incorrect and the perceived goals of our supposed opponent are actually more compatible than we have interpreted them to be, then the resulting competitive conflict dynamic that emerges can actually undermine our own self-interests. This paper examines some of the major theories regarding the cognition of judgment policy that can be used to shed light on the factors leading to interpersonal misperception. This is followed by a hypothesis consistent with these theories to explain how perceptions of opposing interests can be altered to facilitate the realization of mutually beneficial solutions.

Negotiation theorist and practitioner Howard Raiffa argues that instances in which parties hold directly incompatible goals are actually extremely rare in society but competitive dynamics frequently emerge in negotiations (Raiffa 1982). This suggests that conflict is often built on faulty judgments. Indeed, many authors have argued that misperception is a key factor, if not the only factor, responsible for perpetuating conflict and preventing the realization of mutually beneficial solutions to complex problems (Stewart and Gelberd 1976, Keltner and Robinson 1996, Thompson and DeHarpport 1994).

Humans are prone to misperception and faulty judgment policies. This is supported by prevailing theories of cognition. Taylor argued that humans strive to conserve cognitive energy by categorizing the people, events, objects, and natural phenomena around us into generalized groups. There are groups that we identify with and others that we do not. Cognitive social psychologists classify the former as “in-groups” and the latter “out-groups”. As we define these groups in our minds, we develop stereotypes. Stereotypes are heuristic devices that we use to construct a simplified understanding of the way groups function and interact in society. Taylor offers the hypothesis that, “As a result of this categorization process, within group differences become minimized and between-group differences become exaggerated”(Taylor 1981). If this is true then the problem of inter-group conflict can be deeply affected by cognitive exaggerations of out-group priorities.

Prevailing theories of knowledge acquisition and decision-dynamics also support the tendency for faulty judgments. The cognitive equilibrium paradigm suggests that processes of information gathering and synthesis are directed at maintaining internal

harmony with existing systems of knowledge (Zeleny 1989). Milan Zeleny, champion of the cognitive equilibrium framework, argues that,

> We now hold the means of explaining why people remain so stubbornly and extravagantly irrational, ignoring logic, maximization principles and even self-interest . . . The answer appears strikingly simple: *humans do not maximize functions but search for recognizable patterns* (Zeleny 1989).

Rather than being programmed to search for objectively optimal solutions, Zeleny argues that our cognitions are geared toward selectively searching for information that is compatible with our own existing systems of knowledge. In the context of conflict, our cognitive faculties can channel us toward information that supports the past judgments we have constructed of our adversaries even though they may be inaccurate. Furthermore, if we have come to accept faulty judgments as truth, Zeleny's characterization of decision-making processes suggests that we have a tendency to avoid evidence that contradicts these judgments because such information has the potential to upset our state of cognitive equilibrium and harmony. This tendency to avoid disconfirming evidence contributes to the development of highly rigid and non-adaptable schemas for interpreting stimuli encountered in the world (Yu 1984). These schemas, or *habitual domains*, serve as cognitive superstructures that govern patterns of response and reaction to stimuli. Judgment policies are a form of habitual domain that we develop to interpret opponent's priorities.

Chambers' research on conflict misperceptions offers evidence that misperception is a product of our cognitive tendencies. Chambers found in correlational studies that individuals in inter-group conflict tend to perceive opponents to be driven by directly antithetical belief systems though this is often not the case in reality. In one study, Chambers examined parties who felt strongly about the morality of abortion. He found that parties who identified with the 'pro-choice' group perceived that parties who were opposed to abortion were against women's reproductive freedom, the core value of the pro-choice camp. Similarly, parties in the pro-life camp perceived that parties in the pro-choice camp were morally opposed to their core value: the sanctity of human life. In reality, however, Chambers found that all parties firmly valued women's freedom and the sanctity of human life. The conflict therefore did not specifically arise from a clash of core values but rather from differing approaches for synthesizing knowledge and constructing priority systems. Chambers summarizes that,

> Partisan group members suffer the misapprehension that their adversaries work to *actively and willfully oppose their own sides' interests*, rather than promoting the values that are central to their adversaries' doctrine. As we have shown, it is this perception that may spawn the feelings of distrust and animosity partisans feel towards their rivals, and may ultimately fuel conflict between partisan groups. (Chambers 2006)

Chambers' research reveals the fallacy of the reasoning that conflicts are a product of a mere "difference of opinion" between groups. Overcoming misperceptions

involves bridging the gap between the way we see the world and the way the world actually is. Furthermore, if habitual misperceptions of rival priority systems remain deeply ingrained, it is unlikely that negotiation processes alone will move parties in the direction of mutually beneficial solutions. The primary goal of effective conflict management process should therefore be to facilitate dissolution of such habitual domains so that negotiations can at least be grounded in shared understanding and targeted at the true problems at stake.

I argue that the best way for dissolving habitual misperceptions is through a process that focuses stakeholders on *superordinate* goals. Coined by Muzafer Sherif, *superordinate* goals are defined as those,

> . . . which are compelling and highly appealing to members of two or more groups in conflict but which cannot be attained by the resources and energies of the groups separately. In effect, they are goals attained only when groups pull together (Sherif 1954).

In his famous "Robber's Cave" experiment, Sherif cultivated significant conflict between two groups of 11 year old boys for the first two weeks of a supposed summer camp adventure. In the third week, Sherif and his colleagues sabotaged the boys' water supply. Counselors told the boys that there was a leak somewhere along the 1.6 kilometer pipeline that supplied water to the two groups' camps. It was made evident, that finding the leak was going to require that all 22 boys work together. Sherif found that introducing

the superordinate goal of survival helped significantly to reduce conflict between the groups.

In the conclusion to his overview of theories on decision-dynamics and habitual domains, Po Lung Yu argues that “by looking into a higher-order system, we can usually broaden our mind and see other ideas/operators which we could not otherwise see”(Yu 1984). Indeed, s*uperordinate* goals motivate rivals to deconstruct their limited conception of the in-group in deference to a higher system that encompasses the interests of all parties, including those previously perceived to be part of the out-group. By inspiring this transformation, an orientation towards superordinate goals can cultivate a dynamic of collaborative problem-solving that can lead stakeholders to create more accurate judgment policies with regard to one another. This in turn, increases the opportunity for realizing mutually beneficial solutions. Thus, superordinate goal focusing offers a way to circumvent the cognitive tendencies that lead us to exaggerate our differences with out-groups by reframing our habitual systems of categorical stereotypes.

Hypothesis

The hypothesis presented here is that partisans that participate in a process which effectively focuses stakeholders on superordinate goals will develop more accurate judgments of their rivals’ priority systems and lower levels of actual and perceived conflict.

Case overview

Preface

As the largest producer of ground calcium carbonate (GCC) in the world, OMYA has sought to respond to exponentially growing demands for the mineral by expanding its presence throughout the world. Though mining can bring employment opportunities and increased tax revenue to a region, the economically optimal locations for calcium carbonate extraction do not necessarily coincide with the social, cultural, and environmental objectives of the affected communities. Therefore, in opening and expanding mines throughout the world OMYA has faced the challenge of reconciling the economics of the industry with the circumstances of the communities and the region in which it operates.

In regards to OMYA's operations in Vermont, this challenge has taken the form of a process of ongoing conflict management. As the industry grows and evolves in the state, OMYA has both found support and met opposition in its interactions with community members, local businesses, and state agencies. In OMYA's experience, conflict has emerged initially in a competitive battle between stakeholders of opposing positions. In several cases, as conflict has progressed OMYA has been able to further its corporate goals in the state by developing partnerships with community organizations, state agencies, and regional environmental groups. In other cases, conflict became intractable and OMYA was forced to abandon its goals.

Marble mining in Vermont

A vein of calcium carbonate, or pure white marble, runs from Ontario, Canada southward as far as Alabama. The mineral belt passes through the entire state of Vermont from north to south. Despite the very large quantity of calcium carbonate that lies in the vein, there are only several locations where it lies close enough to the surface of the earth that extracting it is cost effective with existing technology and market conditions. One of the few regions in which the mineral is highly accessible is in west central Vermont primarily in the counties of Addison and Rutland. In this region, white marble has been mined for over a century.

Until 1979, the Vermont Marble Company conducted the bulk of commercial marble mining in Vermont. The Vermont Marble Company began commercial operations in 1844 with a focus on extracting raw material in their mine in West Rutland, Vermont. At the outset of the company's industrial activities, West Rutland contained only twenty houses and was not yet incorporated as a town. As the marble industry grew into the 1850's, Vermont Marble Company built tenements to house the growing number of migratory workers that came to work in the mines during the spring, summer, and fall when weather permitted mining activities.

In the decade of 1870 to 1880 the marble industry boomed and West Rutland began to support a growing population of year round residents. West Rutland nearly doubled in size during this period climbing from 1,600 to 3,000 residents and in November 1886 it became incorporated as a town in its own right.

The Vermont Marble Company flourished for a half century after the booming 1870's, supplying white marble primarily to artisans and builders. However, as the depression hit, the Vermont Marble Company, like much of the country, was deeply

affected and was forced to close down many of its quarries in West Rutland. With fewer and fewer jobs available in the mines, nearly 1,000 people emigrated from West Rutland between 1930 and 1950 in search of jobs. After the 1950's, the Vermont Marble Company continued its operations in West Rutland in a limited capacity but in 1978 it was purchased by Stanley Gawet. In 1979, the majority of Vermont Marble Company's former holdings were purchased by OMYA, a multinational mining company based in Switzerland.

When OMYA entered Vermont, the economic circumstances facing the calcium carbonate industry differed from those faced by the Vermont Marble Company. During the heyday of the Vermont Marble Company, demand for white marble was primarily confined to niche markets consisting of artisans and builders. By the 1970's, crushed white marble had become an important input in paper, adhesives, plastic, ceramics, paints, glass household cleanser, paint products, and acid reflux medications (OMYA website). Furthermore, by the time OMYA purchased the former holdings of the Vermont Marble Company the calcium carbonate industry had narrowed globally to contain fewer than five major producers (GII Express 2005). OMYA has generally been credited to command the single largest share of the market for the past several decades, accounting in 2004 for an estimated 39 percent of the total GCC produced worldwide annually. However, being a privately owned company, no precise figures are available concerning the net worth of OMYA(GII Express 2005).

OMYA now holds property in more than 20 Vermont towns and its presence is well known in the region. Throughout OMYA's tenure in Vermont, the company's efforts to maximize returns on investments have led to the emergence of several major

disputes involving community members, regional environmental groups, and state agencies. These disputes have had major impacts on the ability of OMYA to achieve production goals and have led to heightened public involvement in the company's operations.

The Case

In 2002, OMYA began exploring the options for expanding its facilities for storing marble processing waste, or tailings, in Florence. For more than 25 years OMYA had stored its marble tailings in abandoned Dolomite quarries situated conveniently close to its Florence processing facility. However, the dolomite quarry had reached its sub-ground level capacity and OMYA had begun plans for a new above ground tailings storage facility. OMYA's proposed Tailings Management Area (TMA) involved the impoundment of slurry--partially dewatered tailings in the range of approximately 1-2 parts water to 1 part solids (Aldrich et al. 2003). At full capacity, the TMA held the potential of holding more than 40 million cubic feet of slurry though OMYA argued that only a maximum of 450,000 cubic feet would be stored at the site (Schweibert 2003). In August 2002, OMYA approached the Solid Waste Program of the Waste Management Division (SWMD) of Vermont's Department of Environmental Conservation (DEC) to determine if the proposed facility would require a waste management permit (Aldrich et al. 2003).

Vermont Solid Waste Management Rules (SWMR) require companies and individuals in the state to conform to detailed procedural guidelines when disposing of waste. "Waste" in SWMR is defined by a variety of specific criteria and certain

byproducts of production and consumption are exempt from this characterization including,

> Earth materials resulting from mining, extraction, or processing operations except where the Secretary determines that these materials may pose a threat to public health and safety, the environment, or cause a nuisance. (Solid Waste Management Rules 2002)

After a review of OMYA's proposal, Vermont Department of Environmental Conservation (DEC) commissioner Jeffrey Wennberg determined that tailings from the Florence facility constituted earth materials and did not pose a significant threat to the public, the environment or cause a nuisance (Aldrich et al. 2003). Therefore, OMYA's proposed tailings facility was granted an exemption from SWMR regulations. With this preliminary endorsement from the State in hand, OMYA moved on to the Act 250 permitting process for the tailings facility in December 2002.

Act 250 is a Vermont state law that seeks to insure that new development is compatible with existing environmental, social, cultural, and economic trends in the state. New development projects above a certain threshold scale are required to undergo a permitting process to assess whether they meet the regulations outlined in Act 250. The law offers communities substantial leverage in negotiating the terms of large scale development by allowing community members or groups to be granted party status in permit hearings which gives them a place at the table of equal power to that of the developer.

The proposal raised concerns from a group of residents that lived nearby OMYA's land in Florence. Despite Wennberg's decision, residents believed that the proposed tailings storage facility did indeed pose a risk to their health and they coalesced to form Residents Concerned about OMYA (RCO) to leverage their position in opposing the plan. RCO hired engineer Curt Freedman to assess the potential negative health impacts of the proposed tailings facility and to represent RCO's interests during the Act 250 permitting process.

As an informal community stakeholder group, RCO was given preliminary party status and granted attendance at the first Act 250 hearing by the District 1 Environmental Commission to discuss OMYA's proposal. The hearing consisted of lengthy testimony mostly given by OMYA officials and engineers who were cross-examined by Freedman and other residents (Dritschilo 2002). OMYA engineers argued that contaminants found in marble tailings did not pose an imminent threat to the residents because hydro geologically the aquifer below the company's tailings management areas was isolated from that serving the town's water supply. Furthermore, in response to residents concerns regarding contaminants in the mineral waste, OMYA hydro geologist Ameddia Perry explained that of the seven chemicals that had been found in the tailings,

> . . . some had no known negative health impacts, some were no longer disposed of with the tailings, some were naturally occurring and others were only found in trace amounts well within water quality requirements (Dritschilo 2002).

Freedman disagreed with the judgment of Perry and OMYA's other engineers and read a written statement dictating that in his opinion the quarry, ". . . posed a significant threat to public health and the environment . . ." and that, " . . . OMYA needed to do more tests and look into lining the quarry, possibly with a membrane like the ones used in landfills"(Dritschilo 2002). When OMYA attorney Edward Schwiebert engineers disputed Freedman's judgment by calling attention to his lack of sufficient data to back up his findings, RCO's engineer challenged the quality of the data that had been collected by OMYA. Freedman commented that RCO members wished for independent testing to be conducted before a decision was made regarding the safety and viability of the tailings management proposal (Dritschilo 2002).

VCE and RCO took action to request that the State Agency of Natural Resources (ANR) and DEC reconsider the solid waste management exemption that had been granted for OMYA's tailing facility. After releasing a preliminary statement in September of 2003 and eliciting public comment, Wennberg issued a final determination in November that reversed his initial decision. Furthermore, in addition to stipulating that OMYA's tailings were indeed subject to Vermont solid waste laws, Wennberg also determined that the proposed TMA would require a permit to construct a dam to contain the tailings slurry.

In response to Wennberg's final determination the DEC received a number of responses from interested parties. These were compiled for public perusal in an administrative record on the ANR Waste Management Division web page on February 10, 2004. OMYA's lawyers disputed Wennberg's reasoning and the assumptions that the Agency of Natural Resources and the DEC had used in coming to their decision. In particular, OMYA lawyers argued that the company's marble tailings should not be

classified as waste because they were not discarded but rather reserved for future use and sale by the company. Furthermore, Wennberg had conceded in the final determination that OMYA's tailings *were* classified as earth materials but argued that they posed a threat to the public. OMYA lawyers contested this decision and requested further evidence to support this assertion. Ernest Brod, a founding member of RCO, submitted a comment to ANR detailing his evidence gleaned from data collected by OMYA that supported the commissioner's decision. Annette Smith of VCE also supported Wennberg's decision and suggested that there existed the potential for bias in the findings of Heindel & Noyes, the engineering firm OMYA hired to assess the impacts of the TMA. In support of this claim, Smith cited a memo that had been submitted from a hydro-geologist of a separate firm that disputed the findings of OMYA and Heindel & Noyes (Smith 2003).

The Environment and Natural Resource Law Clinic, a department of the Vermont Law School, became involved in the dispute. Vermont Law School lawyer Patrick Parenteau represented the interests of RCO and submitted a response to the Wennberg decision that countered the central arguments of OMYA's lawyers for reversal of Wennberg's final determination. Furthermore, Parenteau broadly contested the efficacy of SWMR arguing that the exemption under dispute,

> . . . has led to much confusion among the public, the regulated community and even among DEC and ANR staff. It is based on bad law, bad science, and bad policy. It has led to inconsistent results and . . . unnecessary contamination and environmental degradation at the Florence site . . . It is

> continuing to sow the seeds of controversy as this current proceeding attests. . . [i]f there is a legal argument that supports the exemption, we would like to hear it. Failing that, the issue will have to be resolved through the courts, an outcome no one wants (Parenteau 2003).

Thus, as groups of stakeholders offered opposing expert testimony in support of their positions little substantive progress was made in the direction of consensus building and the dispute became increasingly intractable. While litigation was expressly considered a last resort, the development of the conflict seemed to be moving in that direction. In an effort to divert stakeholders from this trajectory, OMYA initiated an attempt at mediation in the spring of 2004 at Vermont Law School. Representatives from ANR, RCO, VCE and OMYA participated in the effort which aimed to develop creative solutions to the problems OMYA had been facing stemming from the expansion of the Florence facilities. OMYA offered to fund the majority of the costs of the mediation but in an effort to increase the investment of the other stakeholder groups in the discussion and thus improve the potential for collaboration, it was decided that some portion of the costs would be distributed amongst all of the participating stakeholders. However, for a variety of reasons by the end of the year communication broke down and the parties involved were unable to reach a consensus. Many community members and other stakeholders external to the negotiation process took sides, placing accountability for this failure on whom they thought were most responsible. This further entrenched stakeholder groups involved in the conflict and made litigation ever more imminent.

In November of 2004, Vermont Law School announced that it would be representing RCO in a lawsuit suing OMYA for not taking sufficient steps to contain marble waste leachate and endangering the health of nearby residents (Edwards 2004). OMYA continued to pursue an appeal of Wennberg's final determination but in late April 2005 the commissioner affirmed his previous judgment and required OMYA to either pursue a solid waste permit for the proposed TMA or undergo a lengthy study of the potential impacts of the project.

The decision was a severe blow to OMYA's plans and it became clear that the company needed to work harder to convey to the community its commitment to seeking environmentally and socially acceptable solutions. This mentality coupled with Wennberg's April 2005 decision catalyzed a partnership between OMYA and CLF Ventures a non-profit environmental management consulting service. A branch of the Conservation Law Foundation, CLF Ventures seeks to reconcile the needs of the private sector with the needs for mitigating environmental damage.

In June 2005, the Vermont Legislature, under the guidance of the Agency of Natural Resources, approved Act 65, a law requiring a study of the environmental and human impacts of calcium carbonate mining in the state (OMYAinvermont.com 2005). Section 5 of Act 65 states specifically that,

> The act requires the study to be conducted by a certified, independent, third-party research laboratory and is to be completed and submitted to the Secretary on or before January 15, 2008.

OMYA hired CLF Ventures to serve as an intermediary in this process. CLF Ventures convened the Section 5 Oversight Team to oversee the completion of this study. At the first meeting of the Oversight Team, facilitator Jasmine Tanguay asserted that,

> . . . the purpose of the Oversight Team is not to certify the final results of independent experts, but rather to provide an assurance that the process of studying the issue and selecting third parties is neutral and fair.

The goal of neutrality and fairness constitutes a compelling superordinate goal that all stakeholders can find value in.

Composed of representatives from Pittsford, Florence, Vermont state government, Vermonters for a Clean Environment, Residents Concerned about OMYA, and OMYA, members of the Section 5 Oversight Team have worked to develop protocol for managing environmental concerns. In an effort to build consensus on the science regarding OMYA's proposed TMA, the Oversight Team collaboratively identified and interviewed experts to carry out the necessary research. The process remains ongoing with the results of the study pending.

Methodology

Introduction to methods

The survey method developed for this project was designed to test the hypothesis that superordinate goal-focusing increases the accuracy of stakeholders' judgments of their opponents' priority systems and reduces the levels of actual and perceived conflict. As the Oversight Team process did involve superordinate goal focusing, participants to this process comprised the test condition. The comparison condition—hereafter referred to as the Non-Oversight Team—was composed of members of the same constituencies represented in the Oversight Team process that had not participated in the process itself.

List of stakeholders and their affiliations

Stakeholder Constituency	**Oversight Team Representative (Test Condition)**	**Non-Oversight Team Representative (Comparison Condition)**
OMYA	Tony Colak (OMYA North America Vice President)	Lee Kahn(Environmental consultant for OMYA)
State Government	Claire Ayer(Addison County state senator)	Jeffrey Wennberg (former Vermont Department of Environmental Conservation Commissioner)
Town of Florence	Lynn Silloway(community member)	Bob Demarco(community member)
Town of Pittsford	Don Nickless(community member)	Andrew Wilson(community member)
Vermonter for a Clean Environment(VCE)	Annette Smith(Executive Director of VCE)	Linda Poro(Member of VCE)
Residents Concerned about OMYA(RCO)	Beverly Peterson(co-founder of RCO)	Ernest Brod(co-founder of RCO)

Representation in the Oversight Team process was determined by the devices of CLF Ventures facilitators. The decision to include or exclude parties from negotiation or

dialogue processes has major impacts on the long term effectiveness of agreements reached when they are ultimately implemented. However, this project was directed not at evaluating the substantive outcomes of the process but rather examining the impacts that the process had on the individuals involved. Therefore, the methods CLF Ventures used for determining the groups that should be included in the process and the particular representatives of these groups who would appear at the table were not explored in the research conducted for this project as it extended beyond the scope of the thesis.

The survey referred to a set of critical issues deemed to lie at the crux of the conflict. The issues identified for this project were adapted from a community survey administered by OMYA in November 2005. After revisions to these issue categorizations were made based on input from all Oversight Team members, the following issues were ultimately used in the survey:

- Testing Methods,
- Noise,
- Dust,
- Health and Toxicology,
- Mineral Processing Waste and Tailings and
- Odor.

Testing the hypothesis required a structure that would allow quantitative comparison between the comparison condition and the test condition with regards to the levels of conflict in stakeholders' priorities and intra-group understanding of priorities. Testing the level of conflict required an assessment of the differences in stakeholders' personal priorities. Testing the level of accuracy in stakeholders' judgments of the

priorities of one another required a comparison between perceived priorities and actual personal priorities. The survey included two sections to solicit judgments from each stakeholder of their personal priorities and their predictions regarding the priorities of the other stakeholders involved. The survey required subjects to make actual judgments with respect to the issues and the other stakeholders involved. The survey then used these judgments to construct representations of subjects' judgment policies. The examination of actual judgments has been argued to be one of the only methods for deriving accurate descriptions of judgment policies(Stewart and Gelberd 1976).

The first section required all stakeholders to rank the importance of the six key issues for themselves and predict the priority rankings that other stakeholders would make for the same issues. No two issues could be given the same ranking and therefore stakeholders sometimes were forced to make difficult judgments between issues they perceived to have highly similar priority. This, in turn, offered a framework to guide them through the finer distinctions required in the second section of the survey.

The second section required subjects to rate each issue on a scale of one to ten, with one being the least important and ten being the most important, and to predict the ratings of the other stakeholder groups. This section was designed to challenge stakeholders to make precise judgments—both personal and predictive—regarding the priority differential between the issues. Subjects were allowed to use decimals where they thought it appropriate to make finer distinctions between issues(e.g. Issue 1 is a 9.9 and issue 2 is a 10). Only the results of the rating section were used to test the hypothesis.

The ranking section served as a calibration tool for this section as it offered a means to test the consistency of stakeholders' judgments. If, for example, an issue was

ranked first priority in the first section but did not receive the highest rating in the second section, subjects were contacted and asked to confirm whether the ranking was correct and the rating inaccurate or vice versa. Changes were made in accordance with their responses. As the validity of the subjective judgments solicited could not be verified by any objective means, the ranking section served a critical calibration function.

Indicator mechanisms

The data gathered through the survey process facilitated analysis of the hypothesis through the means of two derived indicators. First, aggregate measures of *Perceived Group Priority* (PGP) were calculated. PGP was determined by the average value of each of the columns in the survey. Second, aggregate measures of *Actual Group Priority* (AGP) for each of the issues were calculated. AGP is defined as the average of all stakeholders' personal ratings for each issue. AGP is thus composed purely of actual personal priority judgments as opposed to the estimated priority judgments represented in PGP.

Analysis is directed both at quantifying deviations in group understanding and measuring the level of conflict that actually exists between stakeholders' priority systems. To accomplish this end, three subsets of the data were derived: Group Understanding(Appendix 6a and 6b), Actual Group Conflict(Appendix 7a and 7b), and Perceived Group Conflict(8a and 8b).

The Group Understanding table displays a set of difference scores corresponding to each stakeholder and each issue. Difference scores in this table were calculated as the absolute difference between Actual Group Priority and Perceived Group Priority. That is, difference scores measure the deviation between what stakeholders perceive to be the

aggregate level of importance of each issue and the actual aggregate group priority of that issue. Therefore, the higher the difference scores the lower the group understanding.

The Actual Group Conflict table displays a second set of difference scores also corresponding to each stakeholder and each issue. Each difference score in this table was calculated as the absolute difference between the stakeholders' personal rating for that issue and the Actual Group Priority of that issue. Therefore higher difference scores indicate higher levels of conflict in the actual priorities of the group.

The Perceived Group Conflict table displays a third set of difference scores also corresponding to each stakeholder and each issue. Difference scores in this table were calculated as the absolute difference between stakeholders' personal ratings of the issues and their estimated aggregate priority of the issue (i.e. PGP). Similar to Actual Group Conflict, difference scores are by definition positively correlated with perceived intra-group conflict.

If difference scores are consistently lower in the test condition than the comparison condition, this will support the hypothesis—partisans that participate in a process that effectively focuses stakeholders on superordinate goals will develop more accurate judgments of their rivals' priority systems and lower levels of actual and perceived conflict.

Analysis

Analysis was directed at testing the hypothesis that a process structure that utilizes superordinate goal focusing, such as that which was implemented by Oversight Team facilitators, contributes to higher levels of group understanding and lower levels of group conflict. Two diagnostic formulations were designed to facilitate comparison between the test and comparison groups. First, Group Level Process Diagnostics offer aggregated measures to compare all of the subjects in the test condition with all of the subjects in the comparison condition. Second, Issue-Specific Diagnostics allow for more fine tuned evaluations of intra-group issue understanding and issue-specific conflict. Be it by issue or group as a whole, difference scores were summed and their standard deviation calculated in each of these diagnostic formulations.

The *Total Difference* column offers an aggregate measure of difference. Difference between actual and perceived group priorities is characterized as the level of Group Understanding. The difference between a stakeholders' actual personal priority for an issue and the actual group priority of that issue on aggregate is described as the level of Actual Group Conflict. Finally, the difference between a stakeholder's actual personal priority and what he or she predicts to be the group priority of that issue is described as the level of "Perceived Group Conflict". Thus, all diagnostic indicators are measured in terms of level of difference. The hypothesis is supported by comparatively lower levels of difference in the Oversight subject responses than those of the Non-Oversight.

The *Standard Deviation* column is an indicator of the uniformity of difference scores. If difference scores were highly similar across stakeholders, then standard

deviation would be low. Thus, standard deviation measures in this case offer an index of fragmentation within the group. Comparing the standard deviation of the test group with the comparison group offers a means of evaluating changes in stakeholder fragmentation that may have resulted from the process. Thus, lower total differences in the test condition, relative to the comparison, are more compelling indicators of the success of the superordinate goal-focusing process when corresponding standard deviations are also lower.

Group Level Process Diagnostics

The results of Group Level Process Diagnostics offered a broad test of the hypothesis that participation in the Oversight Team collaborative problem-solving process has contributed to higher levels of Group Understanding and lower levels of Actual and Perceived Conflict. I will now discuss the specific results shown in the three tables constituting group level diagnostics: Group Understanding, Actual Group Conflict, and Perceived Group Conflict below.

Group Understanding

The Group Understanding results shown in Table 2 indicate a higher total difference score in the test group as compared to the comparison group. Specifically, subjects that participated in the Oversight Team process were collectively over 25 percent more accurate in their predictions of actual group priorities than those who had not participated in the Oversight Team process. Furthermore, the lower standard deviation in

the difference scores of the test group than the comparison group suggests that participation in the process has lead to greater uniformity in judgment policies.

Table 2: Group Understanding

Indicator	Total Difference	Standard deviation
Group Understanding (OVERSIGHT)	37.8	0.7
Group Understanding (NON-OVERSIGHT)	50.9	1.2

Actual Group Conflict

Table 3 below indicates that at the time the survey was administered, participants in the Oversight Team process exhibited substantially lower levels of actual conflict in their priorities than the comparison group. The total difference in Oversight Team members' priorities was less than half that of the comparison group. Furthermore, lower standard deviation in the Oversight Team difference scores than those of the comparison group suggest that conflict is more evenly distributed across stakeholder groups that participated in the process than amongst the subjects in the comparison group.

Table 3 Actual group conflict

Indicator	Total Difference	Standard deviation
Actual Group Conflict (OVERSIGHT)	35.6	0.9
Actual Group Conflict (NON-OVERSIGHT)	86.3	1.4

Perceived Group Conflict

Finally, the Perceived Group Conflict results shown in Table 4 below indicate that participants in the Oversight Team process perceive lower levels of conflict to exist in

their priorities than subjects from the comparison group. The evidence here is not as strong as the Group Understanding and Actual Group Conflict tables but nevertheless the results show lower total difference in the Oversight Group than the Non-Oversight group. Once again, standard deviation in difference scores is lower in the test group than is exhibited in the comparison group indicating that the Oversight Team process may have contributed to greater uniformity in stakeholders' perceptions of conflict.

Table 4 Perceived conflict

Indicator	Total Difference	Standard deviation
Perceived Group Conflict (OVERSIGHT)	47.3	0.9
Perceived Group Conflict (NON-OVERSIGHT)	56.5	1.2

Group Level Process Diagnostics show the test group to have lower total differences than the comparison group in all three indicators: Group Understanding, Actual Group Conflict, and Perceived Group Conflict. Therefore, at a group level the evidence supports the hypothesis that superordinate goal-focusing improves intra-group understanding of priorities and reduces conflict. This is further supported by consistently lower standard deviation scores in the test group relative to the comparison group.

Issue-specific Diagnostics

Issue-specific Diagnostics allow for more fine tuned evaluations of intra-group issue understanding and issue conflict. Whereas Group-Level Process Diagnostics offer aggregate indicators of intra-group understanding and conflict, Issue-specific Diagnostics offer indicators that allow facilitators to identify misperceptions and conflict arising from

specific issues and in turn refine the process to target these problems. Issue-specific Diagnostics for this case show a mixed picture with respect to the hypothesis.

Group Understanding

Total difference scores in Table 4 below indicate that four of the six issues—Dust, Odor, Mineral processing waste and Tailings, and Health and Toxicology—exhibit higher levels of group understanding amongst Oversight participants than the Non-Oversight comparison group. However, the issues of Testing methods and Noise exhibit lower levels of group understanding in the test group than the comparison group. Relative to the comparison condition, standard deviation scores are consistently lower in the test condition. This helps to validate the evidence that the oversight team process has contributed to greater understanding in the four issues mentioned but does not explain the discrepancies shown in the issues of Testing methods and Noise.

Table 5: Issue-specific analysis of group understanding

Group Understanding				
	Total Difference		**Standard Deviation**	
	Oversight	**Non-Oversight**	**Oversight**	**Non-Oversight**
Testing methods -Quality assurance -Risk assessment	8.08	7.85	0.61	1.37
Noise	6.29	3.45	0.66	0.75
Dust	5.49	6.6	0.66	0.89
Odor	4.38	7.4	0.45	0.94
Mineral processing waste and tailings	4.79	11.5	0.44	1.03
Health and toxicology: -Water quality →surface	8.75	13.23	0.98	1.70

water
→ground water

Actual group conflict

Total difference scores shown in Table 6 indicate that the level of Actual Group Conflict is lower for all issues in the test group than the comparison group. Except for Noise, standard deviation is also lower for all issues in the test condition than the comparison. Despite the discrepancy in the standard deviation of noise related responses, the wide margin of improvement in total difference in the Oversight group suggests that the evidence is still highly supportive of the hypothesis.

Table 6 Issue-specific Actual Group Conflict

Actual Group Conflict				
	Total Difference		**Standard Deviation**	
	Oversight	**Non-Oversight**	**Oversight**	**Non-Oversight**
Testing Methods -Quality assurance -Risk assessment	9	9.22	0.69	1.54
Noise	6.83	11.4	1.37	0.78
Dust	8.8	15	0.90	1.26
Odor	5	18	0.52	1.48
Mineral processing waste and tailings	4	13.33	0.82	1.63
Health and toxicology: -Water quality →surface water →ground water	2	18	0.20	1.76

Perceived group conflict

The Perceived Group Conflict results, shown in Table 7, offer a mixed picture with respect to the hypothesis. Lower total difference scores for the issues of noise, dust, odor, and mineral processing waste and tailings in the Oversight group relative to the Non-Oversight group, offer evidence in support of the hypothesis. This evidence is further supported by lower standard deviations for these issues in the test group compared to the comparison.

However, both the issues of health and toxicology and testing methods exhibit significantly higher perceived conflict in the Oversight group than the Non-Oversight group. These issues also have higher standard deviations in the Oversight group than the Non-Oversight group indicating greater fragmentation in judgments after participating in the process. Both of these issues were central to the conflict leading up to the framing of the Section 5 legislation that the Oversight Team was engaged to address. Thus, while the data suggests that the process has led to greater overall convergence in the actual priorities of stakeholders—as indicated by the consistently lower actual conflict both at the group level and at the issue level—it may have had the unintended result of increasing participants' perceptions of conflict around core issues.

Table 7 Issue-specific Perceived Group conflict

Perceived Group Conflict				
	Total Difference		**Standard Deviation**	
	Oversight	**Non-Oversight**	**Oversight**	**Non-Oversight**
Testing	13.75	7.43	1.11	0.69

Methods -Quality assurance -Risk assessment				
Noise	6.79	8.92	0.80	1.18
Dust	6.71	10.93	0.90	1.66
Odor	4.38	11.6	0.42	1.69
Mineral processing waste and tailings	7.38	8.67	0.72	1.04
Health and toxicology: -Water quality →surface water →ground water	8.25	6.77	1.07	1.06

Discussion

The results of the analysis offer a mixed picture with respect to the hypothesis. Some of the indicators offered strong support of the hypothesis while others offered evidence to dispute the hypothesis. Standard deviation measures were generally inconclusive in the analysis which can most likely be attributed to the use of an external comparison group as a comparative mechanism as opposed to an evaluation of Oversight Team participant responses at different stages in the process. Standard deviation in difference scores could be a valuable heuristic tool for measuring whether a process has helped bring stakeholders perceptions into alignment or promoted greater fragmentation in processes of judgment. However, when comparing different groups, as was the case in the methods used here, it is impossible to determine whether it was the process or group specific traits that influenced the standard deviation scores shown.

Group level process diagnostics consistently supported the hypothesis that superordinate goal-focusing increases the accuracy of judgments of rival priority systems and reduces conflict. This was shown in lower total difference scores in the test group than the comparison group for the indicators of Group Understanding, Actual Group Conflict, and Perceived Group Conflict.

Issue-specific Diagnostics, however, offered only partial support for the hypothesis. First, the Group Understanding table indicated that total difference scores of four of the issues supported the hypothesis but two issues—Testing Methods and Noise—had higher total difference scores in the test group than the comparison which did not support the hypothesis. Second, the Actual Group Conflict table showed the test group to demonstrate consistently lower actual conflict in priorities than the comparison group which did support the hypothesis. Finally, the perceived group conflict table showed four issues with total difference scores that were lower in the test condition than the comparison which did support the hypothesis. However, two issues had higher difference scores in the test group than the comparison which did not support the hypothesis. These issues were Testing Methods and Health and Toxicology.

The results of Issue-specific Diagnostics suggest a need for more focused group dialogue on the issues of Testing Methods, Health and Toxicology, and Noise. First, the issue of Testing Methods challenged the hypothesis in that difference scores were higher in the test condition than the comparison condition in Group Understanding and Perceived Group Conflict. This may have been a result of large disparities between the Actual Group Priority of Testing Methods in the test and comparison groups. Testing Methods was on average the second highest rated issue in the test group but the lowest

rated issue in the comparison group. Indeed the issue itself was the stated purpose of the Oversight Team whereas the other issues were more specific environmental impacts of OMYA's operations that had been the source of conflict in the past. As the issue of Testing Methods was of comparatively little concern to comparison group subjects, perceptions may have been fairly accurate as stakeholder groups had not yet fully framed the issue let alone integrated it into their stereotypic doctrines for describing other groups. Conversely, from repeated discussion and disagreement, participants in the Oversight Team may have perceived Testing Methods to become highly conflicted within the group which in turn spawned greater misperceptions surrounding this issue. This would also explain the higher levels of Perceived Group Conflict for this issue in the test condition compared to the condition.

Anomalies with respect to the hypothesis surrounding the issues of Health and Toxicology and Noise were less easily explained. For both of these issues, two of the three indicators supported the hypothesis. For the issue of Health and Toxicology, Group Understanding was shown to be higher and Actual Group Conflict is shown to be lower in the test condition than the comparison condition, which supports the hypothesis. For Noise, Actual Group Conflict and Perceived Group Conflict are lower in the test group than the comparison, which supports the hypothesis. It is only in Group Understanding that Noise undermines the hypothesis and in Perceived Group Conflict that Health and Toxicology does. As both of these indicators—Group Understanding and Perceived Group Conflict—are built upon the predictive judgments of stakeholders, it is possible that with a sample of only six subjects even aggregated measures of perception such as these are subject to enough error to skew the results.

Limitations

This project faced a variety of limitations that impacted the robustness of the results in important ways. Limitations stemmed in large part from my position as a third party researcher with no real standing in the Oversight Team process. This detachment obscured the influence of important nuances of the case on the variables studied and forced me to adopt methodological features that degraded the quality of the data and in turn the conclusions I derived. I was also limited by the fact that the variables I chose to study are inherently subject to a wide variety of influencing factors, making it ostensibly impossible to truly establish causal links between the specific explanatory variable studied—the presence of superordinate goals—and the results observed.

Since I had no stake in the conflict itself and no role in the facilitation process, I was not granted a place at the table during meetings of the Oversight Team process. This detachment had two major negative impacts on the research conducted. First, I was unable to observe and assess the consistency with which CLF Ventures applied superordinate goal-focusing throughout the process. While the overarching purpose of the process was to ensure fairness and neutrality in testing the environmental impacts of OMYA's operations, I was unable to confirm whether this purpose was upheld throughout the process.

Detachment from the process also forced me to resort I was required to select a group of parallel stakeholders external to the process to conduct a comparative analysis of the impacts of superordinate goals. If I had been part of the process from the beginning, I would have been able to administer the survey to Oversight Team participants at the

beginning of the process and then administer it again to the same participants later in the process to measure changes in conflict and understanding. This would have produced more compelling results because changes in understanding and conflict would have been less likely to be influenced by factors unrelated to the particular features of the process. Though the comparison group selected for this project was composed of parallel subjects from the same constituencies represented in the Oversight Team, there is no way of ruling out the impacts of subject specific factors in influencing the results. There is also no way of testing whether stakeholder constituencies were homogenous in there levels of understanding and conflict prior to the process. These unknowns call into question whether the comparison group in fact offered a sound means of comparison for testing the hypothesis.

While a more involved role in the process would have improved my research capabilities, the difficulty in separating the influence of superordinate-goal focusing from other factors impacting levels of group conflict and understanding would have still remained. Indeed, the process that the Oversight Team underwent involved a number of factors that likely helped to reduce group conflict and improve group understanding. First, the location of the Oversight Team meetings—the neutral environment of the Pittsford Public Library—undoubtedly helped to allay tensions within the group and provide an atmosphere more fertile for relationships to be built amongst rival stakeholders than had otherwise existed. Second, the expertise of CLF Ventures facilitators for mediating dialogue within the group may have also played a major role in moving the group towards lower conflict and improved understanding. Once again, from outside the process I have no way of evaluating the prowess of CLF Ventures facilitators in this

regard. Third, the unique position of CLF Ventures as a branch of the Conservation Law Foundation—an environmental organization that had in the past been a leading opposition group in disputes involving OMYA's operations—likely had a major impact on the Oversight Team process. The partnership between CLF Ventures and OMYA in itself represented a major step toward peace and mutual understanding amongst long time rivals and set the Oversight Team process in motion in this direction. Finally, the regular meetings of the Oversight Team offered stakeholders a larger body of knowledge with which to use to construct their understanding of the case. Perhaps more information alone, regardless of the objectives upon which the process was structured, may have sufficiently broadened participants' perspectives of the case to enable more accurate understanding of priorities the complementarities that existed between them.

It is likely that all of the factors mentioned contributed significantly to the levels of conflict and understanding observed in the data. Determining the specific impacts of superordinate-goal focusing would require more controlled research in a laboratory environment. Therefore, this thesis only purports to lend support to the hypothesis that superordinate-goal focusing helps to reduce conflict and promote group understanding, leaving generalizable conclusions open as an objective of future research.

Conclusions

The methodology used for this project offers a tool that both stakeholders in conflict and facilitators of conflict resolution processes could benefit from. For stakeholders, the methodology helps to build empathy in conflict situations by requiring each party to imagine the priorities of rival perspectives. The methodology also helps to focus judgment by offering stakeholders a simplified model of the conflict to calibrate their perceptions of the conflict. Stakeholders can use the survey to visualize the complex interplay of issues and constituencies and to model their own personal processes of judgment. In this way, the methodology developed for this project bears some conceptual similarity to participatory modeling. Participatory modeling is directed at using lay knowledge of the salient issues and relationships that define a problem to create models which can be used to inform policy decisions. By including stakeholders in the process—as opposed to strictly relying on expert knowledge—policy can be better prepared for challenges arising during implementation.

For facilitators, the methodology presented here offers a mechanism for evaluating the impacts process changes have on intra-group conflict and understanding. Indeed, the success of processes of conflict resolution is measured by the degree to which conflict is reduced and interpersonal understanding of priorities is enhanced. These factors are primarily subjective and therefore few quantitative methods exist that are specifically designed to assess their magnitude. The methods offered here may help to fill that void and broaden the tools available to facilitators for testing success.

The methods implemented in this project were new and experimental but overall they proved to offer an effective structure for modeling conflict and interpersonal perceptions of priorities. A more involved role in the process would likely have helped the survey process to produce more robust data but as it were the methodology offered a sound analytical tool for examining levels of conflict and understanding from outside the process. The complexities of conflict ought not to be trivialized, however. Like human beings, no two conflicts behave in precisely the same way and no model can definitively prove causal links between process features and social outcomes.

Appendices

Appendix 1: Survey Template

*Please **RANK** these issues in order of importance to you and estimate the RANKING that the other stakeholders would give.* *→RANKING is ordinal so no two issues can have the same ranking.* *1: Most important* *6: Least important*	**Testing Methods** -Quality assurance -Risk assessment	**Noise**	**Dust**	**Odor**	**Mineral processing waste and tailings**	**Health and toxicology/** -Water quality →surface water →ground water
VCE						
Pittsford						
Omya						
RCO						
Florence						
VT Legislature						

*Please **RATE** these issues in order of importance to you and estimate the RATING that the other stakeholders would give.* *→RATING is not ordinal but no two issues can have the exact same rating. Please use your rankings above as a guide for this portion.* *10: Most important* *1: Least important*	**Testing Methods** -Quality assurance -Risk assessment	**Noise**	**Dust**	**Odor**	**Mineral processing waste and tailings**	**Health and toxicology/** -Water quality →surface water →ground water
VCE						
Pittsford						
Omya						
RCO						
Florence						
VT Legislature						

Appendix 2a: Oversight Team Master Data Set

Stakeholder group alias of subject taking the survey	Stakeholder group being rated	Ratings					
		Testing Methods -Quality assurance -Risk assessment	**Noise**	**Dust**	**Odor**	**Mineral processing waste and tailings**	**Health and toxicology/** -Water quality →surface water →ground water
RED	**Personal Ratings**	10	5	6	7	8	9
	TAUPE	1	2	3	4	5	6
	BLUE	2	1	3	4	5	6
	BLACK	8	5	6	7	9	10
	MAUVE	7	8	9	10	6	5
	CYAN	9	5	6	7	10	8
TAUPE	**RED**	8.5	3	4	5	9	10
	Personal Ratings	6	3	4	5	7	10
	BLUE	6	2	3	4	10	8
	BLACK	7	4	6	5	9	10
	MAUVE	6	3	5	4	8	7
	CYAN	6	3	5	4	8	7
BLUE	**RED**	8	5	6	7	9	10
	TAUPE	5	6	7	8	9	10
	Personal Ratings	9	5	7	6	8	10
	BLACK	5	7	9	8	6	10
	MAUVE	5	7	9	6	8	10
	CYAN	8	7	5	6	9	10
BLACK	**RED**	9.5	8	9	7.5	8.5	10
	TAUPE	1.5	2	3.5	3	4	1
	BLUE	1.5	2	3.5	3	4	1
	Personal Ratings	9.5	8.5	9	7.5	8	10
	MAUVE	9	7.5	9.5	8.5	8	10
	CYAN	9.5	8.5	9	7.5	8	10
MAUVE	**RED**	9	7	6	5	10	8
	TAUPE	10	5	6	7	9	8
	BLUE	9	6	4	5	10	7
	BLACK	9	7	6	5	10	8
	Personal Ratings	6	4	8	5	7	10
	CYAN	9	2	3	4	10	8
CYAN	**RED**	9.5	5	5.5	6	9	10
	TAUPE	4	4.25	4.5	4.75	5.75	6
	BLUE	10	6.5	6.75	7	9.5	9
	BLACK	6	8.75	8.5	8	9	10
	MAUVE	6	8.75	8.5	8	9	10
	Personal Ratings	9	5	5.2	5.5	10	9.5

Appendix 2b: Non-Oversight Master Dataset

		Ratings					
Stakeholder group alias of subject taking the survey	**Stakeholder group being rated**	**Testing Methods** -Quality assurance -Risk assessment	**Noise**	**Dust**	**Odor**	**Mineral processing waste and tailings**	**Health and toxicology/** -Water quality →surface water →ground water
RED	**Personal Ratings**	9.9	7.9	8	8.5	9	10
	TAUPE	9.5	2	3	5	7.5	8.5
	BLUE	2	5	4.5	4.4	10	4
	BLACK	9	4	5	6	8	10
	MAUVE	9.5	8	8.4	8.5	9	9.9
	CYAN	6.9	4	3.5	7	3	8
TAUPE	**RED**	8	1	3	2	7	9
	Personal Ratings	5	3	2	1	6	8
	BLUE	8	3	5	4	7	9
	BLACK	9	5	3	4	8.5	10
	MAUVE	7	6	2	4	8	9
	CYAN	7	2	3	4	8	6
BLUE	**RED**	7	6	9	5	10	8
	TAUPE	4	3.5	2	1	5	3
	Personal Ratings	4	3.5	2	1	5	3
	BLACK	6	8	9	8.5	10	7
	MAUVE	6	8	9	8.5	10	7
	CYAN	5	2	7	6	10	8
BLACK	**RED**	7	6	9	5	10	8
	TAUPE	4	3.5	2	1	5	3
	BLUE	4	3.5	2	1	5	3
	Personal Ratings	6	8	9	8.5	10	7
	MAUVE	6	8	9	8.5	10	7
	CYAN	5	2	7	6	10	8
MAUVE	**RED**	3	5	4	6	1	2
	TAUPE	1	7	8	9	3	2
	BLUE	1	6	5	4	2	3
	BLACK	2	6	3	5	4	1
	Personal Ratings	3	4	5	6	2	1
	CYAN	2	4	5	6	3	1
CYAN	**RED**	8	5	7	6	3	10
	TAUPE	5	6	8	9	7	10
	BLUE	8	5	6	7	9	10
	BLACK	6	7	8	9	4	10
	MAUVE	6	7	8	9	5	10
	Personal Ratings	4	6	7	8	5	10

Appendix 3: Perceived Group Priority

Oversight Perceived Group Priority

		Issues					
		Testing Methods -Quality assurance Risk assessment	**Noise**	**Dust**	**Odor**	**Mineral processing waste and tailings**	**Health and toxicology/** -Water quality →surface water →ground water
Stakeholder Group Aliases	**RED**	6.2	4.3	5.5	6.5	7.2	7.3
	TAUPE	6.6	3.0	4.5	4.5	8.5	8.7
	BLUE	6.7	6.2	7.2	6.8	8.2	10
	BLACK	6.8	6.1	7.3	6.2	6.8	7
	MAUVE	8.7	5.2	5.5	5.2	9.3	8.2
	CYAN	7.4	6.4	6.5	6.5	8.7	9.1

Non-Oversight Perceived Group Priority

		Issues					
		Testing Methods -Quality assurance Risk assessment	**Noise**	**Dust**	**Odor**	**Mineral processing waste and tailings**	**Health and toxicology/** -Water quality →surface water →ground water
Stakeholder Group Aliases	**RED**	7.8	5.2	5.4	6.6	7.8	8.4
	TAUPE	7.3	3.3	3.0	3.2	7.4	8.5
	BLUE	5.3	5.2	6.3	5.0	8.3	6
	BLACK	5.3	5.2	6.3	5.0	8.3	6
	MAUVE	2.0	5.3	5.0	6.0	2.5	1.7
	CYAN	6.2	6,0	7.3	8.0	5.5	10.0

Appendix 4: Actual Group Priority

	Issues					
	Testing Methods -Quality assurance -Risk assessment	**Noise**	**Dust**	**Odor**	**Mineral processing waste and tailings**	**Health and toxicology/** -Water quality →surface water →ground water
Non-Oversight	5.3	5.4	5.5	5.5	6.2	6.5
Oversight	8.3	5.1	6.5	6.0	8	9.8

Appendix 5a: Oversight Group Understanding Table of Difference Scores

Stakeholder Group Alias	Difference Score: = | Actual Group Priority-Perceived Group Priority |	Issue
RED	2.1	**Testing Methods** -Quality assurance -Risk assessment
TAUPE	1.7	
BLUE	1.6	
BLACK	1.5	
MAUVE	0.4	
CYAN	0.8	
RED	0.8	**Noise**
TAUPE	2.1	
BLUE	1.1	
BLACK	1.0	
MAUVE	0.1	
CYAN	1.3	
RED	1.0	**Dust**
TAUPE	2.0	
BLUE	0.6	
BLACK	0.7	
MAUVE	1.0	
CYAN	0.0	
RED	0.5	**Odor**
TAUPE	1.5	
BLUE	0.8	
BLACK	0.2	
MAUVE	0.8	
CYAN	0.5	
RED	0.8	**Mineral processing waste and tailings**
TAUPE	0.5	
BLUE	0.2	
BLACK	1.3	
MAUVE	1.3	
CYAN	0.7	
RED	2.4	**Health and toxicology/** -Water quality →surface water →ground water
TAUPE	1.1	
BLUE	0.3	
BLACK	2.8	
MAUVE	1.6	
CYAN	0.7	

Appendix 5b: Non-Oversight Group Understanding Table of Difference Scores

Stakeholder Group Alias	Difference Score: = | Actual Group Priority-Perceived Group Priority |	Issue
RED	2.5	**Testing Methods** -Quality assurance -Risk assessment
TAUPE	2.0	
BLUE	0.0	
BLACK	0.0	
MAUVE	3.3	
CYAN	0.9	
RED	0.3	
TAUPE	2.1	
BLUE	0.2	**Noise**
BLACK	0.2	
MAUVE	0.1	
CYAN	0.6	
RED	0.1	
TAUPE	2.5	
BLUE	0.8	**Dust**
BLACK	0.8	
MAUVE	0.5	
CYAN	1.8	
RED	1.1	
TAUPE	2.3	
BLUE	0.5	**Odor**
BLACK	0.5	
MAUVE	0.5	
CYAN	2.5	
RED	1.6	**Mineral processing waste and tailings**
TAUPE	1.3	
BLUE	2.2	
BLACK	2.2	
MAUVE	3.7	
CYAN	0.7	
RED	1.9	
TAUPE	2.0	**Health and toxicology/** -Water quality →surface water →ground water
BLUE	0.5	
BLACK	0.5	
MAUVE	4.8	
CYAN	3.5	

Appendix 6a: Oversight Actual Group Conflict Table of Difference Scores

Stakeholder Group Alias	**Difference Score:** = | Personal Priority- Actual Group Priority |	**Issue**
RED	1.8	**Testing Methods** -Quality assurance -Risk assessment
TAUPE	2.3	
BLUE	0.8	
BLACK	1.3	
MAUVE	2.3	
CYAN	0.8	
RED	0.1	**Noise**
TAUPE	2.1	
BLUE	0.1	
BLACK	3.4	
MAUVE	1.1	
CYAN	0.1	
RED	0.5	**Dust**
TAUPE	2.5	
BLUE	0.5	
BLACK	2.5	
MAUVE	1.5	
CYAN	1.3	
RED	1.0	**Odor**
TAUPE	1.0	
BLUE	0.0	
BLACK	1.5	
MAUVE	1.0	
CYAN	0.5	
RED	0.0	**Mineral processing waste and tailings**
TAUPE	1.0	
BLUE	0.0	
BLACK	0.0	
MAUVE	1.0	
CYAN	2.0	
RED	0.8	**Health and toxicology/** -Water quality →surface water →ground water
TAUPE	0.3	
BLUE	0.3	
BLACK	0.3	
MAUVE	0.3	
CYAN	0.3	

Appendix 6b:Non-Oversight Actual Group Conflict Table of Difference Scores

Stakeholder Group Alias	Difference Score: = | Personal Priority- Actual Group Priority |	Issue
RED	4.6	**Testing Methods** -Quality assurance -Risk assessment
TAUPE	0.3	
BLUE	1.3	
BLACK	0.7	
MAUVE	2.3	
CYAN	1.3	
RED	2.5	**Noise**
TAUPE	2.4	
BLUE	1.9	
BLACK	2.6	
MAUVE	1.4	
CYAN	0.6	
RED	2.5	**Dust**
TAUPE	3.5	
BLUE	3.5	
BLACK	3.5	
MAUVE	0.5	
CYAN	1.5	
RED	3.0	**Odor**
TAUPE	4.5	
BLUE	4.5	
BLACK	3.0	
MAUVE	0.5	
CYAN	2.5	
RED	2.8	**Mineral processing waste and tailings**
TAUPE	0.2	
BLUE	1.2	
BLACK	3.8	
MAUVE	4.2	
CYAN	1.2	
RED	3.5	**Health and toxicology/** -Water quality →surface water →ground water
TAUPE	1.5	
BLUE	3.5	
BLACK	0.5	
MAUVE	5.5	
CYAN	3.5	

Appendix 7a: Oversight Perceived Group Conflict Table of Difference Scores

Stakeholder Group Alias	**Difference Score:** = | Personal Priority-Perceived Group Priority |	**Issue**
RED	3.8	**Testing Methods** -Quality assurance -Risk assessment
TAUPE	0.6	
BLUE	2.3	
BLACK	2.8	
MAUVE	2.7	
CYAN	1.6	
RED	0.7	**Noise**
TAUPE	0.0	
BLUE	1.2	
BLACK	2.4	
MAUVE	1.2	
CYAN	1.4	
RED	0.5	**Dust**
TAUPE	0.5	
BLUE	0.2	
BLACK	1.8	
MAUVE	2.5	
CYAN	1.3	
RED	0.5	**Odor**
TAUPE	0.5	
BLUE	0.8	
BLACK	1.3	
MAUVE	0.2	
CYAN	1.0	
RED	0.8	**Mineral processing waste and tailings**
TAUPE	1.5	
BLUE	0.2	
BLACK	1.3	
MAUVE	2.3	
CYAN	1.3	
RED	1.6	**Health and toxicology:** -Water quality →surface water →ground water
TAUPE	1.3	
BLUE	0	
BLACK	3	
MAUVE	1.8	
CYAN	0.4	

Appendix 7b: Non-Oversight Perceived Group Conflict Table of Difference Scores

Stakeholder Group Alias	**Difference Score:** = | Personal Priority-Perceived Group Priority |	Issue
RED	2.1	**Testing Methods** -Quality assurance -Risk assessment
TAUPE	2.3	
BLUE	1.3	
BLACK	0.7	
MAUVE	1.0	
CYAN	2.2	
RED	2.8	**Noise**
TAUPE	0.3	
BLUE	1.7	
BLACK	2.8	
MAUVE	1.3	
CYAN	0.0	
RED	2.6	**Dust**
TAUPE	1.0	
BLUE	4.3	
BLACK	2.7	
MAUVE	0.0	
CYAN	0.3	
RED	1.9	**Odor**
TAUPE	2.2	
BLUE	4.0	
BLACK	3.5	
MAUVE	0.0	
CYAN	0.0	
RED	1.3	**Mineral processing waste and tailings**
TAUPE	1.4	
BLUE	3.3	
BLACK	1.7	
MAUVE	0.5	
CYAN	0.5	
RED	1.6	**Health and toxicology:** -Water quality →surface water →ground water
TAUPE	0.5	
BLUE	3.0	
BLACK	1.0	
MAUVE	0.7	
CYAN	0.0	

Works Cited

Aldrich, Lauren, Tim Marks, Ben R. Smith, Andrea St. John, and Ayala Wineman. 'It's Not Just Dirt' Permitting the Storage of OMYA, Inc. Mine Waste in Florence, VT. Middlebury, Vermont: Middlebury College (2003): 1-27.

Chambers, John R and Darya Melnyk. "Why Do I Hate Thee: Common Misperceptions and Intergroup Mistrust." Personality and Social Psychology Bulletin 32.10. (2006): 1295-1311.

Dritschilo, Gordon. "Neighbors fight Omya waste storage plan." Rutland Herald 19 December 2002.

Edwards, Bruce. "Vt. Law School to take action against Omya." Rutland Herald 12 November 2004.

GII Express Vertical Markets Research Portal. "The Economics of Ground Calcium Carbonate 2nd Edition." 15 May 2005. 17 August 2007 <http://www.giiexpress.com/products/ros27480/>.

Keltner, Dacher and Robert J. Robinson. "Extremism, Power, and the Imagined Basis of Social Conflict" Current Directions in Psychological Science 5.4 (1996): 101–105.

OMYAinvermont.com. OMYA Inc. 2005. 1 May 2007 <http://www.OMYAinvermont.com/lib.htm>

Parenteau, Patrick. Vermont Law School Environment and Natural Resource Clinic memo to Elizabeth McClain. 26 December 2003.

Raiffa, Howard. The Art and Science of Negotiation. Cambridge: Harvard University Press, 1982.

R.L. Banks & Associates, and DuBois & King. OMYA Quarry Material Alternative Transport Legislative Study. Washington, DC: R.L. Banks & Associates, 1999.

Sandole, Dennis J.D. "Paradigms, theories and metaphors." Conflict Resolution Theory and Practice: Integration and application. Ed. Dennis J.D. Sandole and Hugo van der Merwe. Manchester and New York: Manchester University Press, 1993. 3-20.

Schwiebert, Edward V. Letter to Jeffrey Wennberg. 12 October 2003. Vermont Agency of Natural Resources Waste Division. 11 June 2007 http://www.anr.state.vt.us/dec/wastediv/solid/OMYA/Background/20031010.Reiber.Kenlen.Schwiebert.&.Fancy.Schwiebert.pdf.

Sherif, Muzafer. “Integrating Field Work and Laboratory in Small Group Research.” American Sociological Review 19.6. (1954): 759-771.

Smith, Annette. Memo to the State of Vermont Agency of Natural Resources. 26 December 2003.

State of Vermont Agency of Natural Resources Department of Environmental Conservation. Waste Management Division. Solid Waste Management Rules. 24 June 2002. 10 May 2007 <http://www.anr.state.vt.us/dec/wastediv/solid/pubs/swruleadopted6-23-02.pdf>.

Stewart, Thomas R. and Gelberd, L. “Analysis of Judgment Policy: A New Approach for Citizen Participation in Planning.” Journal of American Institute of Planners. 42 (1976): 33-41.

Switzer, Sandy. “Omya plan draws crowd.” Rutland Herald 28 September 2000.

Switzer, Sandy. “Residents oppose quarry proposal.” Rutland Herald 7 February 2000.

Taylor, Shelley E. “Paradigms, theories and metaphors.” Cognitive Processes in Stereotyping and Intergroup Behavior. Ed. David L. Hamilton. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers, 1981. 83-107.

Thompson, Leigh and Terri DeHarpport. “Social Judgment, Feedback, and Interpersonal Learning in Negotiation.” Organizational Behavior and Human Decision Processes 58 (1994): 327-345.

VTCE.org. Ed. Annette Smith. 24 September 2007. 1 March 2007 www.vtce.org.

Yu, Po Lung. “Introduction to Decision Dynamics, Second-Order Games and Habitual Domains.” MCDM: Past Decade and Future Trends *A Source Book for Multiple Criteria Decision Making*. Ed. Milan Zeleny. Greenwhich, Connecticuit and London England: Jai Press Inc., 1984. 25-48.

Zeleny, Milan. “Cognitive Equilibrium: A New Paradigm of Decision Making.” Human Systems Management 8 (1989):185-188.

s