US Army Corps
of Engineers

Shared Vision Planning Applied to Regulatory Decisions
IWR White Paper – M.A. Lorie
July 31, 2006

Introduction and Background

Section 404 of the Clean Water Act (CWA) entrusts the Corps with the permitting of any "discharge of dredged or fill material into" the waters of the United States. This can cover anything from disposal of dredged material to the construction of reservoirs. Permitting decisions are based on guidelines ("404(b)(1) Guidelines") developed jointly with the EPA that are now part of the Code of Federal Regulations (40 CFR 230). These guidelines require that the Corps approve only the *least environmentally damaging practicable alternative* (LEDPA) for a particular project purpose. Furthermore, subsequent agreements between EPA and the Corps establish a sequencing logic, which stipulates that environmental impacts first be avoided, then minimized (through project modifications or permit conditions), and finally mitigated. Mitigation is not to be considered in identifying the LEDPA, but is added to the LEDPA only after it has been identified.

The vast majority of permit applications are processed quickly and effectively without controversy. A small number of projects, however, usually large municipal water supply projects such as new reservoirs, garner a great deal of opposition among other state or Federal agencies and among environmental advocacy groups. The CWA and subsequent guidelines and agreements give a great deal of power to opponents of potential permits (Shabman and Cox, 2004). Because of this, the onus is placed on the permit applicant to prove that their need for the project is legitimate and that they have proposed the LEDPA for meeting this need. Depending on the level of pressure exerted by project opponents through the Corps, other agencies or the Courts, the process of evaluating a project can become a long, protracted fight. Project opponents may challenge various elements of the analysis that goes into the permit evaluation (e.g., water demand forecasts, effectiveness of water conservation programs, environmental impacts of a new reservoir) in their attempt to defeat a project. This can lead to an adversarial process that takes many years and costs millions of dollars to run its course.

Water is a finite resource, so some conflict over management and policy choices may be inevitable. However, in certain cases, the procedures used by the Corps to implement the 404(b)(1) Guidelines in permit evaluations can be ineffective for managing potential conflicts and, indeed, they may often exacerbate conflicts. This white paper will argue that the Corps' typical permitting process is insufficient for controversial projects and that a different approach may be called for. Shared Vision Planning is recommended as an alternative approach that can help remedy some of the potential problems of the existing situation. These arguments and recommendations are focused on permits for large municipal water supply projects, but it is possible that they can be generalized to other permitting situations.

Potential Problems in the Permitting Process

The typical process for a CWA 404 permit is sequential (see Shabman and Cox, 2004 for a summary)[1]. The process is initiated by the applicant (a water provider) who has designed a project to meet some water supply need. The water provider then applies for CWA 404 permit with the local Corps District. The District must approve the purpose for the project (usually by preparing or approving a NEPA "Purpose and Need" statement) and must conduct an alternatives analysis to identify the LEDPA (this is usually done in conjunction with an EIS). A good deal of work is already completed (and resources invested) before partnering agencies (e.g., EPA, FWS) and public stakeholders have an opportunity to engage in the process. There are various requirements for public involvement along the way, usually of the sort typically used to satisfy NEPA (public notices, public meetings etc.). If the public involvement process results in significant opposition and controversy, the Corps and/or applicant may have to revisit certain issues, such as the purpose and need or the alternatives analysis. Eventually the Corps identifies the LEDPA and if the applicant is satisfied with this alternative, which may or may not be their original preferred alternative, then a permit is granted.

At this point, EPA and the FWS, who are often pressured by environmental advocacy groups, have the opportunity to elevate the decision to a higher level within the Corps (the Division or eventually Headquarters). The governor of the relevant state also has the ability to elevate the decision. And in the end, the CWA allows the EPA to veto any Corps decision if it sees the project as causing unacceptable environmental impacts. Public advocates may sue at various points to force the Crops or the EPA to reevaluate their decisions.

Often, the lines between these steps in the sequence are blurred. An applicant can engage the Corps district well before it is ready to apply for a permit, allowing the Corps to influence the design process. Also, regulations require public involvement when products and documents are in draft form so that the public may influence the final versions. Furthermore, the Corps routinely engages the EPA and FWS early in a permit evaluation process. So coordination and cooperation are fundamental to a typical permitting process. Despite this, the sequential nature remains. The process is initiated by the applicant, who independently conducts much of the analysis, the Corps then reviews the permit application and applies its environmentally focused guidelines, and other organizations influence the process after the fact. In addition, there appears to be a preference among water supply developers and environmental advocates for this sequential process. Water suppliers design their projects independently and then environmental advocates use the CWA permitting process to defeat them (Shabman and Cox, 2004).

Section 404 of the CWA mandates that environmental objectives be imposed on the development and design of water projects. But the sequential nature of the permitting process means that these environmental objectives come into play only after alternatives have already been designed, and usually they are designed with less emphasis on the environmental considerations and more emphasis on financial and water supply reliability considerations. But the project can only go forward if it meets these mandated environmental objectives, and influential

[1] This white paper provides a general description of what can be considered the typical permit evaluation process used within the Corps. This is based on the Corps regulations, official procedures, literature on case studies, and discussion with regulatory project managers. There will be differences between districts.

environmental groups will work hard to make sure that these environmental issues are addressed. Project proponents and opponents then become entrenched in their position for or against a particular project, often using competing technical analysis to justify their positions.

Ideas from various fields, such as conflict resolution and decision analysis, demonstrate why such a sequential process can result in protracted fights and point to a different approach that might avoid some of these pitfalls. This can be summarized in four points.

1. A successful process must be founded on a broad set of stakeholder objectives. Stakeholders are those individuals/groups who are affected by or can affect the decision, including the project applicant and the Corps regulator. Objectives should capture what stakeholders want, what they think is important, or what they are required to accomplish (e.g., the Corps regulator). The sequential process brings different sets of stakeholders and their objectives into the process at different times, making it difficult to find solutions that strike an effective balance among all the objectives. Incorporating a broad cross section of objectives early in the process ensures that they all receive due consideration.
2. It is important to promote an interest-based rather than a position-based negotiating environment. Position-based approaches stymie creative problem-solving because people stick to their default position (e.g., anti-reservoir) and are usually uninterested in where new ideas might lead. An interest-based focus encourages stakeholders to think strategically about their objectives and promotes new ideas.
3. As much as possible, the technical analysis supporting a permit decision should be jointly controlled by all stakeholders and it should be transparent to stakeholders. This prevents situations of "dueling science" in which opponents wage their battle using different technical results to justify their positions. The technique of *joint fact finding* is particularly relevant here.
4. Objectives, interest-based negotiating and joint technical analysis allow for a productive collaborative process. The collaboration should be focused on joint formulation of mutually acceptable alternatives. Too often, collaborative processes have ill-defined goals and little expectation for concrete products.

An approach with these features can help remedy the pitfalls of the sequential permitting process. It is argued here that the application of Shared Vision Planning (see Palmer et al) to the water supply development and permit evaluation process would promote these features and help the Corps avoid big controversies such as those seen in the Two Forks and King William cases.

Shared Vision Planning for CWA 404 Permits

How Shared Vision Planning Works

Shared Vision Planning (SVP) is distinguished from other approaches by its incorporation of disciplined water resources planning principles, structured public participation, and the use of collaborative modeling in the creation of an integrated decision support tool. SVP as a planning method is generally based on the Principles and Guidelines. A SVP process begins by building a team of key stakeholders and identifying their objectives. Every effort is made to reach out to all significant stakeholders. The team defines the objectives and develops metrics for evaluating

alternatives. The team works with analysts to develop a model of the system and to initiate studies to fill important data gaps (environmental impacts, demand forecasts etc.). The model eventually incorporates the decision variables (whether and where to build a project; how to operate a project) and impacts the alternatives will have on objectives as measured by the metrics. The team, assisted by analysts, then uses the model to formulate and evaluate alternatives that provide a range of outcomes against the objectives. The model is designed to be transparent and easy to use so that the team can work together to test new ideas and learn about the impacts of various alternatives. This collaborative formulation and evaluation sets the stage for a negotiation process in which stakeholders can debate which alternatives are appropriate given performance against the objectives, the requirements of NEPA and the CWA. In short, Shared Vision Planning is designed to incorporate the four characteristics described above.

Apparent Difference between SVP and 404 Permitting

There are some conceptual differences between SVP and the manner in which CWA 404 permit applications are evaluated. On the surface the differences seem obvious and suggest that it might be very difficult to apply SVP to regulatory decisions. However, current regulations and guidelines incorporate enough flexibility to allow for a different kind of approach, such as SVP.

In general, SVP and 404 permitting appear to rely on fundamentally different approaches to decision-making. Permitting under the 404(b)(1) Guidelines can be described as a constraint-based approach to decision-making. Impacts to aquatic resources should be avoided; in other words, for a given project purpose, the ideal alternative is the one that involves no impacts to aquatic resources. If impacts to aquatic resources are unavoidable, then the project should be designed and/or operated so these impacts are minimized. Finally, after impacts are avoided and minimized as part of the project design process and the LEDPA has been identified, the resulting impacts to aquatic resources should be mitigated.

In contrast, SVP is better described as an overall balancing approach in which tradeoffs between objectives are evaluated and the alternative with the most appropriate balance of outcomes (however that is defined among participants and analysts) is selected. Stakeholders in the process define objectives and performance metrics. The modeling process predicts the impacts that all alternatives will have in terms of the performance metrics. It is then up to the participants in the process to evaluate and compare these predicted outcomes, and engage in a negotiation process to select an alternative.

Consider a fictitious reservoir planning example as an illustration. Suppose there are four objectives:

1. minimize the cost of building the reservoir
2. maximize the reliability of water supply from the reservoir
3. minimize the amount of wetlands inundated
4. maximize sport fishing opportunities in the stream below the reservoir.

Suppose six alternatives, each with different locations and/or designs, are developed and have the impacts shown in Table 1.

Using a general balancing approach like that in SVP, participants would debate which alternative provides the best overall mix of outcomes and would justify their decision based on some explicit decision criteria. For example, the participants might agree that Alternative B is the most appropriate because, in general, the impacts are "in the middle" for all objectives which might be seen as a good overall balance. The 404(b)(1) guidelines, however, might not allow for alternative B because it causes significantly more impacts to wetlands than alternatives C, D and F. If the approved alternative must avoid and minimize impacts to aquatic resources, then alternative B might be *unacceptable* and alternatives C and F might be the only permittable options (assuming the difference between 4 and 5 acres of inundated wetlands is negligible). But Alternative C is by far the most costly option, while alternative F is the worst option for water supply reliability.

Table 1

Alternatives	Cost ($1000s)	Reliability (1-probability of shortage)	Wetlands inundated (acres)	Fishing opportunities (flow suitability score: 0=worst, 1=best)
A	3,405	.99	26	.89
B	2,990	.98	22	.76
C	6,001	1.00	5	.70
D	4,455	.97	16	.68
E	2,612	.94	27	.88
F	2,008	.91	4	.73

Would alternatives C or F be required by the 404(b)(1) guidelines? The answer probably rests on two key issues. First, the answer to this question would depend on the defined and approved *Purpose and Need* for the project. Second, the interpretation of "Practicable" would influence how this question is answered.

Flexibilities in the 404(b)(1) Guidelines

The 404(b)(1) Guidelines clearly require that the Corps approve and permit only the least environmentally damaging practicable alternative that meets a given project purpose. Flexibility comes in establishing the project purpose(s), determining whether alternatives meet the project purpose(s), and determining whether alternatives are practicable.

The 404 permitting process includes a step to define the purpose of the project requiring a permit. This often takes the form of a NEPA "Purpose and Need" statement. Corps guidance suggests that the project purpose "be specific enough to define the applicant's needs, but not so restrictive as to preclude all discussion of alternatives." There is not a hard and fast rule for determining the project purpose, though some loose guidelines have come out of various Court decisions. For a given water supply project, the purpose could be set at providing a certain safe yield for a 50-year drought, or it could be to provide safe yield for a 100-year drought. The purpose should be reasonable and it is left to the discretion of the Corps project manager in conjunction with the applicant.

In addition, depending on how the purpose is defined, determining whether an alternative meets that purpose might not be a clear cut process. For example, there will be uncertainties, and implied risk management choices, associated with the analytical results used to determine safe yield and other factors. The "Purpose and Need" statement may not deal explicitly with these risks and uncertainties, so this determination will be left to the discretion of the Corps, the applicant and, perhaps, other participants in the permitting process.

Perhaps the most significant flexibility comes in defining *practicable* alternatives within a given permitting process. The 404(b)(1) Guidelines define a practicable alternative as one that "is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." This provides some direction on the factors that must be considered when determining practicability, but allows for significant flexibility. Practicability is, to a large degree, left to the discretion of the Corps. The applicant, EPA, and other agencies and organizations will seek to have considerable influence over this aspect of the process because it is so crucial for the outcome.

Together, these elements of the permitting process—defining Purpose and Need and practicability—allow for flexibility in determining the LEDPA and reaching a decision. The ideal environmental alternative—the one that imposes the least environmental damages—is the presumed target for the permitting process. But the flexibilities in the guidelines allow the Corps to permit less environmentally preferable alternatives depending on the needs of the applicant and factors such as costs and logistics. In other words, determining the LEDPA involves making tradeoffs between objectives such as minimizing impacts to wetlands, providing a certain level of service for water supply, and minimizing project costs. It is rarely described this way, but the tradeoffs are implied by the discretionary decisions made during the permitting process.

The fictitious results in Table 1 can illustrate the point. Earlier it was suggested that under the 404(b)(1) Guidelines, alternatives other than C and F might be unacceptable because they all cause more environmental impacts. But as described here, the project Purpose and Need and issues of practicability must be considered. Alternative C is far more costly than the other alternatives, so it might not be considered practicable. Alternative F may not meet the project purpose and need because it has the lowest water supply reliability score. There are no clear rules for making these determinations; it is largely left to the discretion of the Corps and so tradeoffs between a variety of objectives will necessarily be made. Therefore, there are clear similarities and compatibilities between a general balancing approach like SVP and the regulatory approach of 404 permitting.

The Real Differences between SVP and 404 Permitting

Since the flexibilities of the 404(b)(1) Guidelines allow for making tradeoffs among various objectives, it is argued here that an approach like SVP is compatible with the logic of the Guidelines. There are at least two crucial differences, however. One difference is that the two approaches have different starting points for analysis. Because SVP is based on P&G planning, its typical starting point for analysis, or its rebuttable position, is the no action alternative and the task of the planning exercise is to justify some action. For example, for a water supply planning exercise, the rebuttable position is to build nothing and all other alternatives are compared to that

no action alternative. The analysis is used to justify (or not) the construction of reservoir of a certain size and design in order to meet certain water supply needs. Under the 404(b)(1) guidelines, the rebuttable position is the alternative that is ideal for the environment—i.e., the alternative that causes the least environmental impacts regardless of any other factors. The task of the permit evaluation is to determine, based on costs, applicant needs and other factors that fall under the category of practicability, how much environmental damage is justifiable.

Starting with different rebuttable positions potentially results in different final decisions because it can shape the kind of analysis that is done and it can frame the discussions leading to a permit decision. However, this difference between SVP and the Guidelines can be reconciled. The essential features of SVP, which were summarized above, do not require that the rebuttable position be the no action alternative. The essential logic of analysis within SVP—i.e., using a multi-objective, systems-based approach—can be applied to a decision in which environmental considerations receive greater emphasis, as is the case with 404 permitting. Implementing SVP with the rebuttable position of 404 permitting may introduce some new challenges that will need to be addressed, but the benefits of the SVP approach can still be gained.

The other crucial difference between SVP and the 404 permitting process is likely to be more challenging—each approach relies on different institutionalized processes that are used to execute a study or project. The key distinction here is that the permitting process is sequential, as described above, while SVP is designed to be "front-loaded", with substantive involvement of stakeholders from the earliest stages of a project. Typically, the applicant initiates a permitting process and conducts much of the analysis that is used to support it. This limits stakeholder involvement in discussions of key issues, such as the basic need for a project. In general, it's appropriate for an applicant to If SVP is to be used for regulatory decisions, the procedural differences will need to be identified and resolved.

SVP is founded on P&G planning and relies on many of the methods and techniques typical to Corps planning studies. Section 404 permitting is a regulatory process which has evolved along a separate track within the Corps. Furthermore, the people who work on Corps planning studies and those who set Corps planning policy are different from the people who work in the Corps' regulatory program. This suggests that there might be significant cultural differences between the two programs that would need to be overcome.

Recommended Actions

A collaborative approach like Shared Vision Planning can offer many benefits to the regulatory program, especially for permit applications that are likely to spark public controversy. There are some differences between SVP and the approach usually used for 404 permit decisions, but it is argued here that these differences are not insurmountable. However, several key questions remain. First of all, how relevant is SVP for the regulatory program—are there likely to be many controversial permit applications in the future? How can SVP be applied to regulatory decisions under current policy? Are certain policy changes needed for SVP to be applied in the regulatory program? What policy changes would make SVP more feasible, or even routine, in the regulatory program? SVP has been beneficial in other water planning situations but it has not

been applied in a regulatory context. It is important to examine how well SVP would work for 404 permit decision. Several activities could address these questions.

1. Is there a need for SVP in the regulatory program? There certainly have been controversial cases within the regulatory program that *might* have benefited from a rigorous collaborative decision-making method. IWR is currently preparing a survey that will go out to regulatory project managers at various districts. This survey is intended to gather information from project managers about current and anticipated permit applications. The results of this survey will help IWR determine the likelihood of controversial permit cases in the near future. Follow-up actions could shed more light on the potential need for a method like SVP

   Recommendation: IWR should follow-up the survey with targeted interviews of a handful of regulatory project managers. The interviews would gather more details about responses to the survey questions, and it could ascertain project managers' expectations about how controversial projects are handled and their views about the applicability of an approach like SVP.

2. SVP and current regulatory program policies. Current Corps regulatory policy probably allows for SVP to be applied, but it is not entirely clear; further investigation is warranted.

   Recommendation: IWR should conduct a brief investigation and prepare a short report on what current regulatory policies mean for SVP. The report could point out potential sticking points and necessary policy changes. It could also suggest policy changes that would encourage methods like SVP as a matter of routine for contentious permit decisions.

3. How well would SVP work for permit decisions? As noted above, SVP has never been applied in a regulatory context. Because it has been successful in other contexts, IWR predicts that it would be beneficial for permit decisions as well. This could be examined in one of two ways.

   Recommendations: Conducting and evaluating the outcomes of a test application would be the best way to address this need. If possible, IWR should organize and lead a SVP process for a current or upcoming 404 permit case. Ongoing discussions with the Omaha District may lead to an application of SVP in Colorado, and there are potential opportunities with the Norfolk District as well. If a case study is initiated, a formal process for evaluating its success should be implemented. This project evaluation should produce a separate report.

   Barring an application of SVP to a permit decision, IWR could prepare a report that would start to address this question. The report

would have to rely on: a) information produced as part of the survey and interviews described in #1 above; b) the policy analysis conduced in #2 above; and c) lessons drawn from the work of other agencies, such as FERC's alternative relicensing process.

References

Palmer , R. A., H.E. Cardwell, M.A. Lorie, and W.A. Werick, 2007 "Planning, Participation, and Systems Modeling – the Shared Vision Planning Approach to water resources decision making", *J. Water Resources Planning and Management* (in revision).

Shabman L. and Cox W. (2004) "Urban water supply and the environment: Extending the reach of Section 404 of the Clean Water Act." *Virginia Environmental Law Journal*, 23, 71-103.

"Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material" Title 40 *Code of Federal Regulations*, Pt. 230. 2005 ed., 260-261.