PREVENTION OF CONTRACTUAL DISPUTES OVER WASTE PROCESSING FACILITIES

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ABSTRACT

Several waste processing facilities have experienced serious difficulties that, given proper and careful conduct of the procurement process, could have been avoided. Some of these difficulties have led to legal disputes, with inordinate amounts of time and effort being spent to resolve them. Based on the authors' experience with a number of projects, in many instances the problems could have been prevented, or at the very least, responsibility clearly assigned to the proper party by the development of a properly conceived procurement process. This paper will discuss some of the key steps, as well as some of the common faults, in the procurement process and carefully prepared service agreement. The paper will cover important topics that should be discussed in the Request for Proposals, as well as critical items that should be analyzed and incorporated in a "typical" contract. Some of the contractual items that are covered include definitions of technical terms, issues concerning characteristics of the waste stream, performance guarantees, and acceptance test plans. The paper discusses the importance of having a thorough understanding and the ability to apply the underlying principles of the technologies in order to best assure that the legal, fiscal, and technical elements of the contracts are correctly addressed and integrated.

INTRODUCTION

Overview

The development of a successful waste processing project commences at the point of preparation of the Request for Proposals (RFP). The preparation and execution of a service agreement concludes the process. A procurement process that is not conceived properly can result in an unsuccessful project and in disputes. Invitations for problems can occur as early as the RFP stage. A second opportunity occurs during development and negotiations of a service agreement.

Herein we examine the technical aspects of the procurement process that in our experience lead and have led to substantial problems after groundbreaking of a number of waste processing projects. Our experience encompasses materials recovery facilities (processing source separated and mixed waste), composting facilities (yard waste and mixed waste), and waste-to-energy facilities. We concentrate in this paper on the key technical aspects. Space limitations preclude a full treatment of all of the technical aspects.

With respect to the legal aspects of the procurement process, our purpose is to describe the necessity of integrating them with the technical aspects in order to foster an unambiguous and complete service agreement. We have assumed an audience enlightened in the elements of the procurement processes for waste processing facilities. Consequently, we do not describe every issue in the processes. Our intent is to cover the key aspects, some of which are absolutely critical to assuring a successful project.

Historical Perspective

The development and implementation of an agreement for solid waste systems is hindered by the fact that the systems vary in scope and design from location to location, and that the modern solid waste processing industry is relatively new. Thus, innovation and technological advancements are key components of systems offered by service providers. For example, despite the fact that a substantial number of material processing facilities (and here we in-

TABLE 1 PREVALENT MISCONCEPTIONS THAT RESULT IN POORLY DRAFTED RFPs AND SERVICE AGREEMENTS FOR WASTE PROCESSING PROJECTS

1. The characteristics of solid waste are so variable that their determination is impossible or impractical.
2. The definitions of technical terms used in most contracts have meaning in terms of practicality, or of scientific and engineering principles.
3. Generic performance parameters and criteria exist for each processing technology (e.g., composting, RDF, etc.) and they can be universally applied.
4. The legal and technical aspects of waste processing agreements have little or no relation to one another.
5. Performance parameters, criteria, and guaranteed values have meaning without a plan describing the methods and procedures of testing (i.e., an acceptance test plan).

clude RDF front-end systems) have been constructed, very few, if any, are exact replicas of previous designs. The upshot is that relatively few precedents exist upon which to base service agreements. The lack of replication impedes the development of good contracts. Instead of improving upon the last agreement, the circumstances (i.e., significant changes in conditions) dictate a substantially different agreement, unless, of course, a conscious decision is made to conform an agreement for a different location and set of conditions to a project of substantially different circumstances. This type of decision is, in most instances, not satisfactory in the long run.

The situation is somewhat different in the case of transfer stations and massburn facilities where relatively more of these facilities have been constructed and operated in relation to the number of other waste processing technologies. In the case of these two technologies, the procurement and contracting processes have benefited from a number of generations of request for proposals and of construction and operating agreements.

An agreement must be rational on a technical basis or it will not be interpreted uniformly. To be rational, the technical aspects of the agreement must be based on and not violate the fundamental principles[a] that govern the applicable technologies. An explicit result of this tenet is a knowledge and understanding of the technical fundamentals.

Our experience has been that certain misconceptions are prevalent in solid waste processing and contribute to poorly developed RFPs and service agreements and therefore diminish the odds for successful projects. To the degree that these misconceptions can be corrected, the potential of a successful project increases dramatically. The misconceptions are summarized in Table 1. Some of the misconceptions in the table are virtual precedents of the solid waste industry so that their changing requires an educational process and time. Much of the subsequent discussion relates to overcoming the misconceptions described in Table 1, as well as to other aspects that when adequately considered increase the likelihood of a successful procurement process and project.

[a]Fundamental principles are those scientific and engineering principles (e.g., laws of thermodynamics, of chemistry, of biology, etc.) that describe and govern the operations of waste processing.

BASIC TECHNICAL ASPECTS

The method of dealing with several basic areas of the RFP and of the resulting agreement governs the success of the procurement process in allocating risks, responsibilities of the parties, and remedies in case of disputes and of non-performance. Some of the basic areas include the following:

- definition of terms
- fundamentals of technology
- waste stream
- product uses and markets
- performance guarantees
- acceptance test plan

The meaning, relevance, and importance of these areas are discussed below.

Definition of Terms

The RFP and the contractual agreements must have a section that describes the meaning of key terms. The selection of terms as "key" and their description requires careful thought in order to avoid ambiguity and thus problems associated with interpretation. Our experience is that too little attention is paid to the selection of appropriate terms and to their definitions. When problems arise, the omission of carefully defined terms that are important to interpreting the meaning of agreements provides the parties to the agreement with opportunities to shift risks and responsibilities associated with the project from the intended party. In our experience, the definitions associated with describing solid waste and its derivatives and components (e.g., solid waste, acceptable waste, processible waste, oversize bulky waste, etc.) are oftentimes sought out as the vehicle to circumvent an intended contractual responsibility if a project experiences problems.

The terms relevant to a procurement process for waste processing services extend beyond legal and financial. Relevant terms include those that describe or explain solid waste, technology, performance criteria, and test methods. Herein we refer to these terms as technical terms.

Fundamentals of Technology

A project providing for the construction and operation of a solid waste processing facility is obviously developed around the processing technology. This basic circumstance necessarily makes a portion of the development of the RFP and of the resulting legal instrument (i.e., the agreement) a technical undertaking. One reason is that technical terms

have to be used in the RFP and in the agreement in order to have both documents interpreted correctly and uniformly. Another reason is that the resulting agreement must be technically and legally compatible or the result may be: 1) a legally unenforceable term or condition, or 2) a dispute.

The fundamentals of the technologies that are the subject of the procurement process must be known and understood for the basic reasons that: a) the terms and conditions of the resulting agreement should not contradict the fundamental principles upon which the technologies are based, and b) the RFP and the resulting agreement should contain adequate technical terms and conditions to assure a successful project. However, prior to a discussion of the relevance of fundamentals of technology to the procurement of processing services, the potential technical areas of the RFP and agreement are described below.

The technical areas relevant to the development of a sound RFP and agreement include: a) definitions of technical and technology-based terms, b) performance criteria and guarantees, c) acceptance testing, d) technical specifications, and e) description of the facility(ies) and technology(ies). The latter two areas (i.e., d and e) usually are addressed in sufficient detail in agreements for waste processing services and, consequently, are not addressed further in this discussion. The inclusion of areas a, b, and c, above, in waste processing agreements and their extent is a function of the type of services and facilities that are the subject of the procurement process.

While compatibility among the technical areas in an RFP and resulting agreement may seem an obvious condition, practice has shown that the condition is inadequately fulfilled in more than a few instances. For example, classic categories of incompatibilities are: a) technical specifications that contradict or compromise performance criteria or guarantees; b) parameters of performance guarantees that are not supported at the fundamental level, that either are not defined or are poorly defined, or that cannot be adequately measured according to the acceptance test plan; and c) properties of waste stream exiting one subsystem are incompatible with the needs and performance requirements of the subsystem that is down stream. The incompatibilities described in category c are particularly prone to occur (and have occurred a number of times) where two or more entities (e.g., equipment suppliers) must interface their subsystems. The result is that the overall system does not function and none of the entities wants to assume responsibility.

An understanding of the fundamental principles of the relevant technologies enables the developers of RFPs and agreements for waste processing to circumvent the problems of incompatibility. This understanding can only be provided by qualified and experienced scientists and engineers of the parties to the project. The qualifications and experience concerning the technologies should include methods of testing and of analytical laboratory work as well as the principles of waste processing. One of the reasons is that the aforementioned areas must be tied together by technical terms and, therefore, their definitions. If the integration of the three areas is not complete, the consequences are likely to be ambiguities, incompatibilities, and contradictions in the resulting agreement for services.

Waste Stream

The importance and relevance of the waste stream to the process of procuring waste processing services are at least three-fold. First, a guarantee of quantity of waste is usually a part of the service agreement. A miscalculation in quantities can impact the performance and cost of the technology.

Second, the properties of the waste to be processed impact the performance of the technology. Solid waste has a number of properties that are relevant to processing. The specific properties that are important to a given technology and project can be categorized into those that are technical, environmental, and related to occupational and public health and safety. The properties include component composition (e.g., percent paper); physical (e.g., particle size); thermal (e.g., heating value); and chemical (e.g., concentration of heavy metals). Since they influence the performance of the technology, the properties of waste are a key consideration in developing processing agreements. (A simple example would be that the time period to produce a stable compost is closely related to the ratio of carbon-to-nitrogen in the compostable feedstock, other factors not being a limitation.) In some instances consideration is given to waste characteristics during the development of the RFP and of the agreement, but the performance of the technology is not specified as contingent upon the properties of waste. In other cases, the relationship is overlooked altogether. The risk associated with waste characteristics is usually assigned to the service provider, sometimes to the procurer of the facility, and seldom to the supplier of the waste. In some cases, the risk is not assigned to any party of the agreement.

Third, fluctuations in waste quantities or properties impact the design and operation of a facility. If not known or estimated correctly when entering an agreement for waste processing services, fluctuations can cause substantial operating problems and therefore impact the performance and cost efficiency of the facility.

Product Uses and Markets

The mere recovery of products by a processing technology is an insufficient condition for a successful business agreement. Both the rate of recovery (i.e., yield) and the quality of the products (i.e., specifications and properties) must be specified in the agreement if the risk of use and marketing of products is to be minimized. Defining the

yield and the quality of products is a technical exercise requiring a fundamental knowledge of the uses and markets, and of the parameters that characterize the products.

Performance Guarantees

Most waste processing RFPs and agreements are performance-based as opposed to specification-based. The reasons are that: a) waste processing technologies are relatively new when compared to other industries, and b) as stated before, in many cases the conditions are different from location to location, thus the designs vary. The alternative to a performance-based procurement, a specification-based procurement, is one that requires certain technical specifications (e.g., prices of equipment). This form of procurement is effective and appropriate if the same performance requirements have been replicated at a number of locations and thus the performance is well known.

For performance-based procurements, the performance criteria must be described. As alluded to earlier, the criteria must not contradict technical principles.

Some procurement processes specify technical performance requirements for the processing system as well as specify equipment preferences. This situation is a potential formula for trouble inasmuch as extreme care must be taken to assure that the risk of system design and of performance remains with the service provider and that the risk cannot be assigned to the organization requesting the services.

Acceptance Test Plan

An acceptance test plan (ATP) is a plan that describes the methods and procedures that will be used to determine if the supplier of a facility meets the technical performance guarantees set for the project. In the waste processing industry, ATPs run the gamut from vague to very detailed. From our standpoint, if performance guarantees are included in an agreement, the agreement should also include a detailed ATP. The reason is that technical performance guarantees without a description of appropriate methods and procedures for determination are worth very little. Oftentimes waste processing agreements have no plan (or a vague one) for acceptance testing, or indicate that the plan will be developed after execution of the agreement. The reason for this circumstance is not known. Suffice it to say that a comprehensive and technically detailed ATP should be included in agreements that have technical performance guarantees. Reasons for this suggestion include: a) the ATP forces consideration of appropriate and concise technical terms, and b) an ATP defines how performance will be measured. (Without a method of measurement, a performance guarantee is meaningless.)

Draft Agreement

Problems in the procurement of waste processing services can develop at the initial stage of requesting proposals if a draft agreement is not included as part of the RFP. The reason is that the agreement is the governing legal instrument and not the RFP. Without a draft agreement as part of the RFP, an RFP rarely describes in sufficient detail the terms and conditions for the agreement that will result from the solicitation. A draft agreement can be used to give the parties a clear understanding of the responsibilities and obligations of each party and an envelope around the structure of the project, including agreements, subagreements, or provisions for:

- waste supply
- design
- construction
- operation
- residue disposal
- end product use/markets

A full-service draft agreement (i.e., an agreement that requires the contractor to finance, design, construct, and operate the facility) would include each of the above areas for completeness. Other forms of service provision (e.g., turnkey) would include only some of the above areas.

The draft agreement should also include a draft ATP. The plan should reference the performance criteria stipulated in the RFP, describe the methods and procedures of testing and of data analyses, and the frequency of testing.

Integration of Basic Technical Aspects into the Agreement

Each of the basic aspects identified in the preceding section should be incorporated into the final agreement for processing services in order to have a legal instrument that fully describes all of the areas, terms, and conditions that are necessary for a successful project. The draft contract serves as the foundation of the agreement that will be negotiated between the parties. On a technical level, an agreement for waste processing services should mimic the flow diagram for the project, i.e., contain sections that address waste supply, processing, and the output flow streams. The output flow streams can be materials or forms of energy (e.g., steam, electricity). Disposal or market agreements, depending on the nature of the stream, close the loop around the project structure. Each of these sections must then be integrated through the use of consistent and unambiguous: a) terms, b) performance criteria, and c) test procedures.

The relation of the various aspects of a waste processing project is shown in the example in Figure 1. The following are important to notice:

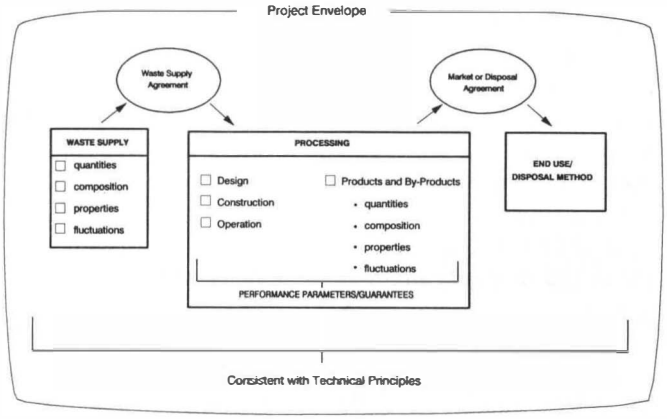

FIG. 1 EXAMPLE PROJECT STRUCTURE FROM A TECHNICAL PERSPECTIVE AND RELATION OF THE PARTS AND BASIC ASPECTS

(*1*) The project envelope as it pertains to the technical conditions must be determined in order to assure that all responsibilities, obligations, and risks are encompassed in the agreement.

(*2*) Agreements for waste supply, markets, and disposal of residues (or firm terms and conditions in their absence) are required to place responsibilities and obligations on the intended parties.

(*3*) Performance parameters and guarantees encompass all of the activities associated with the processing facility and must be compatible.

(*4*) The descriptions, terms, and conditions of the project should be consistent with the applicable fundamental (i.e., governing) technical principles.

Examples of Problems and Remedies

While the preceding discussions have focused primarily on generalities of the procurement process, in this section we provide some specific problems that we have encountered and their remedies. The examples are intended to illustrate the issues and problem areas. The location of the projects and the exact processing capacities are omitted in order to preserve the anonymity of the participants. The examples are taken from a wide variety of processing technologies, of processing capacities, and of form of the agreement, and reflect a range of problems that stem from inadequate RFPs and the resulting agreements, or inadequate enforcement of terms and conditions.

The problems and the methods of remedy that would have eliminated or mitigated the problems are described in Table 2 for seven waste processing projects. From the description of the suggested remedies, the reader will note that for a substantial number of problems a knowledge and an application of technical principles to the procurement process would have eliminated or mitigated the problems. Reiterating our prior admonition, the application of technical principles to the RFP process and to the development of the service agreement must be conducted by all parties to the contract and by qualified and experienced professionals.

TABLE 2 EXAMPLES OF CONTRACTUAL PROBLEMS ASSOCIATED WITH WASTE PROCESSING FACILITIES

Type of System	Capacity (TPD)	Problem	Remedy
MSW Composting	400 to 900	No definition of stability of compost product. Poor definition of participant responsibilities and inadequate integration of subsystems.	Inclusion of definition and method of analysis in contract. Proper notation of the fundamentals that govern the mechanical and biological processes, and process design and assignment of processing responsibilities based on the fundamentals.
Yard Waste Composting	400 to 900	Inadequate processing capacity resulting in generation of substantial malodors.	Performance testing specified in the operating agreement was not conducted; conduct of testing would have identified the problem.
RDF	400 to 900	System capacity less than required; therefore, high operating costs.	Understanding of the fundamentals of waste processing and equipment operation. Less reliance on opinions of operators. Selection of proper performance criteria and use of a comprehensive acceptance test plan.
RDF	900 to 2000	Ambiguous performance guarantee and inadequate test method in the contract.	Understanding of fundamentals of test methods and procedures for waste processing. Inclusion of complete test methods in the contract as opposed to developing after execution of contract.
MSW Composting	100 to 400	Inadequate estimation of time required to reach biostabilization of compost.	Understanding of the fundamentals of waste processing (in this case characteristics of the feedstock and the key parameters that govern the process of composting).
MSW Composting	400 to 900	Poor quality of compost product. Inadequate method of aeration/ mixing of composting mass.	Inclusion of a market agreement in the operating contract stating the specifications of the compost product. Understanding of the fundamentals of waste processing and composting, and of operation of compost aeration and mixing equipment.
RDF	900 to 2000	Maintenance much greater than planned, poor product quality, efficiency, and operating characteristics.	Understanding of the fundamentals of waste processing (in this case lack of consideration of the impact of large scale-up of unproven equipment and of the inherent inefficiencies of processing operations and the cumulative results of the inefficiencies).

With regard to one very specific example of a problem and remedy in the area of definition of terms and measurement, we address the composting of waste. Several mixed waste composting projects have suffered from technical and legal myopia in the case of the definition of "stable" compost. (Synonyms for "stable" as the term is used in composting of waste include "mature" and "biostabilized.") Unfortunately, no standard or consensus definition of stable exists in the solid waste industry. Although one standard definition does not exist, several definitions and test methods are available and suitable for use in agreements. Obviously, the term requires a definition if used in an agreement and a method of measurement. However, many RFP's and agreements for waste composting services suffer not only from a poor definition or no definition of stability of compost but also from a lack of a method of measurement. The results are predictable. They include operator incapability of a downstream process operator to process "compost" claimed as "stable" or "mature" by the operator of the upstream processing system but lacking the properties of a stable compost. Other unfavorable results are malodors from stockpiled but unstable compost and phytotoxic effects of unstable compost when the user expects a stable material.

Without stipulating in the agreement a method of measurement of stability of compost, stability has no meaning in the technical sense. The consequence, in some cases,

has been disputes over whether or not a compost is stable and how to determine stability since the method was not specified or was poorly specified in the agreement. A proper definition of stable and of a method of measurement of stability of compost eliminates the problems discussed above.

CONCLUSIONS

The road to a successful waste processing project begins during the preparation of the RFP and continues through the negotiation of the service agreement. The process flows smoothly if all of the relevant technical aspects of the project are taken into consideration and integrated appropriately into legal structure of the agreement. The technical aspects include a knowledge and understanding of the fundamental principles that govern the processing technology(ies) that are the subject of the agreement. Experience has shown that a lack of consideration of fundamental principles during the RFP and contractual process in a number of cases leads to problems during the construction and operating phases of the project. Consideration of technical aspects also forces developers of RFPs and agreements to correctly address technical terms and their definitions, as well as the basis of parameters, criteria, and methods of measurement of technical performance.

An understanding of the technical aspects of the RFP and contractual processes and the integration of the technical aspects into the processes are necessary to avoid technical problems after groundbreaking, including failure to meet performance guarantees.

Hopefully, the discussion herein serves to further the understanding and importance of the technical aspects of the procurement process and their relation to the legal aspects.