Recommendations of the

Individual Sewage Disposal System Steering Committee

February 14, 2002

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Executive Summary

An "individual sewage disposal system" or "ISDS" provides wastewater treatment and disposal, primarily for individual homes (as well as some commercial and business establishments) in areas not served by central sewer systems and wastewater treatment plants. [Terminology note: consistent with Recommendation #1 set forth below, the term "onsite wastewater system" is used instead of "ISDS" in the remainder of this document.]

Particularly as growth has led to a rapid proliferation of onsite wastewater systems in some portions of Colorado, issues have been raised regarding potential water quality impacts from such systems and the adequacy of current efforts to minimize such impacts. The ISDS Steering Committee was established in early 2001 by Jane Norton, Executive Director of the Colorado Department of Public Health and Environment. The Steering Committee members represent a wide range of expertise and interests related to onsite wastewater systems.

At its initial meetings, the Steering Committee members agreed that an important first step in their efforts would be to arrive at a consensus regarding the current status quo with respect to the potential water quality impacts of onsite wastewater systems. This effort led to the development of a Summary Characterization of Onsite Wastewater System Impacts, which is set forth in Appendix B to these recommendations. Based on its assessment of options to address the principal risk factors identified in the Summary Characterization, the Steering Committee developed the recommendations listed below.

The Steering Committee strongly supports the continuation of the current system under which local governments have the primary responsibility for regulatory oversight of onsite wastewater systems. Recommendation #2 addresses steps recommended to be taken by local governments to enhance current onsite wastewater system management. However, to expect the local public and private sectors to bear the sole responsibility for improvement to the overall state onsite wastewater system management program is unrealistic in view of the statewide nature of these issues.

In many ways, Recommendation #3 set forth below is the linchpin for the overall set of recommendations offered by the Steering Committee. In recommending that a new full-time state position be established, the Steering Committee wishes to emphasize that it is not proposing to shift responsibilities for onsite wastewater system management or to change the respective roles of state and local government. Rather, the Steering Committee believes that it is important to establish a meaningful state presence that can provide leadership and help advance the efforts by multiple jurisdictions to address the challenging issues related to onsite wastewater system management. Although the Steering Committee recognizes that the addition of any new FTE to state government poses a significant issue at this time, it believes that one full-time state position to address onsite wastewater system issues represents a very modest commitment to this area in comparison to the state resources devoted to management of wastewater treatment plants. This is particularly true since approximately one-fourth of the state population is served by such systems, rather than by centralized wastewater treatment.

Recommendation #1:
At the first opportunity, based on the need for other revisions to the current state legislation, the terminology used in statute and regulations addressing this program should be changed from "individual sewage disposal system" to "onsite wastewater system".

Recommendation #2:
Local governments should review their existing onsite wastewater system programs relative to the risk factors listed in the Summary Characterization of Onsite Wastewater System Impacts set forth above and assess the potential for enhancements to their existing programs to assure that the primary risk factors are adequately addressed. These reviews should seek to assure that those resources that are currently available, or can be made available, to address onsite wastewater systems are utilized in the most effective manner possible.

Recommendation #3:
The Department of Public Health and Environment should develop a high priority proposal for the authorization of resources to fund a minimum of one full-time position at the Department of Public Health and Environment, either through cash funds or a combination of cash and general funds. This position would provide state-level leadership to support local government oversight of onsite wastewater systems by addressing the priority issues and needs identified below.

Recommendation #4:
Colorado should strive toward the development of a performance-based approach to onsite wastewater system management that includes mechanisms for the verification of system performance. The approach should take into account varying local resources and needs, and should include adequate education and training, research and funding to support these efforts.

Recommendation #5:
The Department of Public Health and Environment should convene a focused process, with local governments and other interested stakeholders, to develop an appropriate set of performance criteria for onsite wastewater systems in Colorado, tailored to differing receiving environments. It is important that this process also explore options and develop recommendations regarding how to utilize these criteria to transition to a performance-based management system, including consideration of the appropriate state and local roles. For example, once such performance criteria are developed, consideration should be given to the appropriate role of prescriptive requirements for onsite wastewater systems (e.g. specific design and siting requirements) in relation to the performance criteria, and the current variance system regarding prescriptive requirements.

Recommendation #6:
The Department of Public Health and Environment, with input from local governments,

should review and evaluate available information regarding potential onsite wastewater system management options and make available to counties information about model systems that can be tailored to local needs.

Recommendation #7:
Three steps should be taken regarding renewable permits: (1) the Board of Health should adopt a regulation clearly authorizing local governments to issue renewable permits for onsite wastewater systems; (2) a focused process should be convened, with a full range of interested stakeholders, to develop models for renewable permit systems that address factors such as the appropriate triggering event and the appropriate length of permits; and (3) the stakeholder process should assess whether there are some circumstances in which the state should proactively encourage or require renewal permit systems or alternative mechanisms to assure ongoing maintenance and proper functioning of systems.

Recommendation #8:
The Department of Public Health and Environment, working with local governments and other stakeholders, should develop strategies and programs for education and training of persons involved with onsite wastewater system use, regulation, design, installation, maintenance or inspection. These efforts should include development of an appropriate, consistent certification system for professionals in the field, unless an alternative mechanism can be identified to assure that adequate training occurs.

Recommendation #9:
The General Assembly should identify a continuing source of funding to support onsite wastewater system research efforts in Colorado. The Department of Public Health and Environment, working with academic leaders, as well as local governments and other interested stakeholders, should develop a specific proposal regarding ongoing research needs.

Recommendation #10:
The Department of Public Health and Environment should work with local governments and other interested stakeholders to review available options for financing onsite wastewater systems, including single systems and cluster systems in high density areas. This review should also address both new systems and repair or rehabilitation of existing systems.

Recommendation #11:
The Department of Public Health and Environment should work with local governments and other interested stakeholders, including representatives of wastewater treatment facilities, to examine current septage management options and develop a strategy for assuring environmentally sound and economical management alternatives throughout the state.

Recommendation #12:
The Department of Public Health and Environment, working with interested stakeholders, should assure that the expertise of both the Board of Health and the Water Quality Control

Commission are utilized in regulating onsite wastewater systems to protect public health and the environment. In addition, there should be further clarification or refinement of their respective authorities toward this end.

Recommendation #13:
This Steering Committee should reconvene one year after the finalization and submission of this report to assess the progress that has occurred toward implementation of the above recommendations, and report back to the Board of Health and the Water Quality Control Commission at that time regarding its conclusions.

I. Background

A. Formation of the Steering Committee

An "individual sewage disposal system" or "ISDS" provides wastewater treatment and disposal, primarily for individual homes (as well as some commercial and business establishments) in areas not served by central sewer systems and wastewater treatment plants. [Terminology note: consistent with Recommendation #1 set forth below, the term "onsite wastewater system" is used instead of "ISDS" in the remainder of this document.]

Particularly as growth has led to a rapid proliferation of onsite wastewater systems in some portions of Colorado, issues have been raised regarding potential water quality impacts from such systems and the adequacy of current efforts to minimize such impacts. Since 1995, efforts have been underway to heighten awareness of potential weaknesses in the current Colorado onsite wastewater system program and to identify potential solutions. These efforts, led by local regulators, professional associations, private sector professionals, and academia, have resulted in revisions of the Colorado ISDS statute and regulatory guidelines, development of professional training opportunities and creation of the ISDS Technical Advisory Committee. In 1999, a broad-based work group effort generated a Preliminary Risk Assessment, which attempted to clarify what we currently know – and do not know – regarding potential water quality risks from such systems. In May, 2000, the Colorado Board of Health and the Water Quality Control Commission held a joint meeting to discuss these issues. That meeting resulted in a consensus that a steering committee should be established to further explore the issues raised.

The ISDS Steering Committee was established in early 2001 by Jane Norton, Executive Director of the Colorado Department of Public Health and Environment. The Steering Committee members represent a wide range of expertise and interests related to onsite wastewater systems. A list of the Steering Committee members is attached as Appendix A to these recommendations. The Steering Committee was co-chaired by Dr. Chris Wiant, member of the Water Quality Control Commission and President of the Caring for Colorado Foundation, and Kim Cook, member of the Colorado Board of Health and Rio Blanco County Commissioner. The Steering Committee met approximately monthly over the course of the past year. All meetings were open to the public, and a number of other individuals participated from time to time.

Jane Norton requested that the steering committee transmit its responses and recommendations regarding a list of questions (set forth below) no later than March, 2002. She stated her intent that once submitted the Steering Committee's recommendations would be made available for public review and be presented to the Board and the Commission with an opportunity for public comment.

B. Questions Addressed to the Steering Committee

Jane Norton's initial letter to Steering Committee members requested that the following questions be addressed:

- What, if any, information currently exists beyond that set forth in the Individual Sewage Disposal System Preliminary Risk Assessment developed by the Department work group to better characterize the potential public health and water quality risks in Colorado from individual sewage disposal systems?

- What should, and realistically can, be done to develop additional information regarding the potential public health and water quality risks in Colorado from individual sewage disposal systems?

- What can be done to improve education of each of the following groups regarding individual sewage disposal systems and their potential impacts, including providing appropriate management tools: homeowners, contractors, engineers, regulators, land use planners and elected officials?

    - Are the current regulatory structure and available resources adequate to control potential individual sewage disposal system impacts? If not, what should be done? This would include consideration of the following principal issues identified in the Department work group's June, 1999 Preliminary Summary of Individual Sewage Disposal System Issues:

    (1) Are current performance standards adequate to address both public health and cumulative water quality concerns?
    (2) Is the current permit approval process adequate?
    (3) Is the current system adequate to assure proper ongoing operation and maintenance of individual sewage disposal systems?
    (4) Does the current system provide adequate training and/or certification of designers, installers, site evaluators and inspectors?

The results of the Steering Committee's consideration of the first question are set forth in the Summary Characterization of Onsite Wastewater System Impacts, which is described in the following section of this document. The Steering Committee's responses to the remaining questions are incorporated into the discussion of Issues and Recommendations set forth in the remainder of this document.

C. Summary Characterization of Onsite Wastewater System Impacts

At its initial meetings, the Steering Committee members agreed that an important first step in their efforts would be to arrive at a consensus regarding the current status quo with respect to the potential water quality impacts of onsite wastewater systems. This effort led to the development of a Summary Characterization of Onsite Wastewater System Impacts. The full version of this document, including footnotes, is attached as Appendix B to these recommendations.

The Summary Characterization states that, from the available information, it appears that:

1. Water quality impacts are occurring from onsite wastewater systems in a number of specific areas in Colorado. However, the presence and nature of these problems often has not been verified or rigorously documented. In fact, few well-documented studies have been done in Colorado that directly link water quality or health risks with onsite wastewater systems. Examples of identified impacts include elevated nitrate and/or bacteria levels in ground water used for drinking water, and nutrient loadings adversely affecting surface waters.

2. The overall scope and extent of water quality impacts from onsite wastewater systems in most areas of Colorado is unknown. It is possible that additional impacts that have not yet been identified are occurring.

3. Although few site-specific studies have been completed, it appears that substantial cumulative loadings of nutrients to state waters are likely occurring in some areas where there are a significant total number and density of onsite wastewater systems;

    a. There are areas of known nitrate contamination and increased nitrate levels in ground water in areas of high density (lots less than one acre) and a significant number of homes.

    b. In some surface water basins, phosphorus loadings from onsite wastewater systems are a potentially significant water quality factor.

4. The potential risk posed by onsite wastewater systems varies greatly depending on a number of factors. Onsite wastewater systems pose relatively greater water quality risks when:

    a. They are present in high numbers and high density;

    b. They are present in areas served by private drinking water wells that are shallow or poorly constructed;

    c. They are improperly sited, particularly in sensitive environments;

    d. They were installed prior to 1973, when uniform design and siting standards were first established; and/or

    e. When they are not properly designed, installed, operated and/or maintained.

5. Growth trends in Colorado are likely to result in the installation of substantially greater numbers of onsite wastewater systems in the years to come. In some areas of Colorado, it will continue to be necessary and appropriate to serve homes and/or businesses with onsite wastewater systems, rather than centralized wastewater systems.

> Properly sited, designed, installed, operated and maintained onsite wastewater systems can function without resulting in adverse water quality impacts.

Following completion of the Summary Characterization of Onsite Wastewater System Impacts, the Steering Committee turned its attention to identifying options to address the identified risk factors. Based on its review of available options, the Steering Committee has developed the recommendations set forth below for improvements to the management of onsite wastewater systems in Colorado.

D. Overview of Current Onsite Wastewater System Management in Colorado

As background for the discussion of potential improvements to the management of onsite wastewater systems in Colorado, the Steering Committee provides the following summary of the current management structure. To provide some context, it is estimated that there are currently over 600,000 onsite wastewater systems in the state, with roughly 7,000 to 8,000 new permits issued each year. Approximately one-fourth of the state population is served by such systems, rather than by centralized wastewater treatment.

Pursuant to state statute, the State Board of Health adopts Guidelines on Individual Sewage Disposal Systems. These Guidelines establish minimum standards for the location, construction, performance, installation, alteration and use of individual sewage disposal systems (referred to in these recommendations as onsite wastewater systems). These Guidelines are implemented principally through rules and regulations adopted by local Boards of Health. The state role is limited to establishing the Guidelines and reviewing local regulations for consistency with the minimum standards contained in the Guidelines. The Water Quality Control Division currently devotes a total of less than one full-time equivalent (FTE) to efforts related to onsite wastewater systems (if you add up the fractional time of central office staff and 12 district engineers). By comparison, the Division devotes over 35 FTE to management of centralized wastewater treatment plants.

Local governments have the primary governmental oversight role for onsite wastewater systems. In addition to adopting requirements consistent with the state Guidelines, they have responsibility for issuing permits for the construction of such systems, including ensuring that a final inspection of each permitted facility is performed. Local programs are also responsible for the inspection of operating systems to determine if they are in conformance with established requirements, and for taking enforcement action where necessary. Local governments are also authorized to establish maintenance and cleaning schedules and practices for onsite wastewater systems and to implement programs for the licensing of both systems contractors and systems cleaners.

II. Issues and Recommendations

Issue #1: Terminology

An initial issue discussed by the Steering Committee concerns terminology. The term "individual sewage disposal system" is used in the current Colorado statute and regulations

addressing these systems. However, there is a consensus among Steering Committee members that this terminology is misleading, since the purpose and function of these systems is not solely "disposal". Although it is difficult to identify a simple, single term that accurately describes all such systems, the Steering Committee agrees that "onsite wastewater system" is the phrase in most common use in the industry today and is an improvement over the "ISDS" terminology.

Recommendation #1:
At the first opportunity, based on the need for other revisions to the current state legislation, the terminology used in statute and regulations addressing this program should be changed from "individual sewage disposal system" to "onsite wastewater system".

Issue #2: Need for Enhanced Local Programs

As described in the Background section above, management of onsite wastewater systems in Colorado to date has principally been the responsibility of local governments. The Steering Committee supports this structure, in view of the widely varying circumstances and needs in different counties and communities across the state. The primary onsite wastewater system oversight and regulatory role should remain at the local level. Therefore, in looking toward potential improvements to existing efforts, it is appropriate to look first at opportunities for enhancement of the local role.

At present there is great diversity in local regulatory programs across the state. Regulatory efforts range from highly developed, progressively analytical programs to minimal permitting and inspection only. Whatever the scope and extent of local programs, as addressed in the following recommendation, the Steering Committee believes the primary risk factors identified above in the Summary Characterization of Onsite Wastewater System Impacts can be used to review opportunities for program enhancement.

The Steering Committee believes that, to the extent feasible according to local circumstances, all local onsite wastewater system regulatory programs should include the following minimum elements:

- Permitting of all new, upgraded and repaired onsite wastewater systems;
- Inspection of all work conducted under permits issued by a regulatory agency;
- Tracking inventory and location of all onsite wastewater systems in a jurisdiction;
- Appropriate and timely enforcement for all failing or otherwise non-compliant systems;
- Education of and information sharing among users, installers, engineers, inspection and maintenance professionals, and regulatory officials involved with onsite wastewater system management;
- Identification of locally sensitive environments that may be negatively impacted by use of onsite wastewater systems; and
- A process to address and respond to any local public health and water quality

impacts related to onsite wastewater systems.

Recommendation #2:
Local governments should review their existing onsite wastewater system programs relative to the risk factors listed in the Summary Characterization of Onsite Wastewater System Impacts set forth above and assess the potential for enhancements to their existing programs to assure that the primary risk factors are adequately addressed. These reviews should seek to assure that those resources that are currently available, or can be made available, to address onsite wastewater systems are utilized in the most effective manner possible.

Issue #3: Need for an Enhanced State Leadership Role

As noted above, the Steering Committee strongly supports the continuation of the current system under which local governments have the primary responsibility for regulatory oversight of onsite wastewater systems. However, to expect the local public and private sectors to bear the sole responsibility for improvement to the overall state onsite wastewater system management program is unrealistic in view of the statewide nature of these issues. Moreover, local agencies with responsibilities for onsite wastewater systems typically are addressing this area as one of many responsibilities, making it difficult to devote substantial resources to this one area. Therefore, there is a strong consensus on the Steering Committee that an enhanced state leadership role is needed to support local government to assure an effective overall management program. Some of the specific challenges with respect to which leadership is needed are fleshed out through the remaining issues and recommendations set forth below.

In many ways, Recommendation #3 that is set forth below is the linchpin for the overall set of recommendations offered by the Steering Committee. In recommending that a new full-time state position be established, the Steering Committee wishes to emphasize that it is not proposing to shift responsibilities for onsite wastewater system management or to change the respective roles of state and local government. Rather, the Steering Committee believes that it is important to establish a meaningful state presence that can provide leadership and help advance the efforts by multiple jurisdictions to address the challenging issues related to onsite wastewater system management. Although the Steering Committee recognizes that the addition of any new FTE to state government poses a significant issue at this time, it believes that one full-time state position to address onsite wastewater system issues represents a very modest commitment to this area in comparison to the state resources devoted to management of wastewater treatment plants, as noted above.

The subsequent issues and recommendations set forth below propose a number of actions to be taken by the Department of Public Health and Environment – i.e. by the person in the recommended new state position. The recommendations identify multiple issues and efforts that the Steering Committee believes could usefully be addressed to improve onsite wastewater system management. The state role that is envisioned is not one of imposing new, top-down requirements in these areas, but rather providing leadership by facilitating a

multiple-stakeholder effort – with local government representatives as key players – to address the identified issues. Clearly, much more is identified than could be addressed by one full-time state employee in a short amount of time. Rather, the Steering Committee envisions a need for the new state FTE to prioritize and work with local governments and other stakeholders to decide how best to address these issues over time.

As addressed in the Summary Characterization, onsite wastewater systems pose a water quality risk if not properly sited, designed, installed, operated and maintained. In view of the numbers of existing onsite wastewater systems in the state (estimated to exceed 600,000 systems), and the likelihood that growth trends will result in the installation of substantially greater numbers of such systems in the years to come, onsite wastewater systems need to be addressed as an important and integral element of the overall, long-term water quality picture in Colorado.

Recommendation #3:
The Department of Public Health and Environment should develop a high priority proposal for the authorization of resources to fund a minimum of one full-time position at the Department of Public Health and Environment, either through cash funds or a combination of cash and general funds. This position would provide state-level leadership to support local government oversight of onsite wastewater systems by addressing the priority issues and needs identified below.

Note: Appendix C to these recommendations sets forth a preliminary fiscal analysis of the options for funding such a position.

Issue #4: Need for a Performance-Based Program

The Steering Committee believes that an effective onsite wastewater system program needs to be performance-based. That is, there is a need to identify the levels of performance that onsite wastewater systems should be expected to achieve in order to provide adequate protection of public health and water quality. In contrast, the existing Colorado program is based on specific design requirements that are focused primarily on disposal of wastewater, rather than treatment. Onsite wastewater systems need to provide viable long-term solutions to wastewater management in those areas where they are, and will continue to be, relied upon. Therefore, in recent years there has been a growing recognition nationally, by local governments and others involved with management and oversight of these systems, that programs are likely to be more effective if they are focused on performance criteria that reflect long-term needs, rather than on prescriptive codes.

Appropriate performance criteria may vary by location, depending on differing receiving environments. However, the overall management system needs to define such criteria to provide a target or reference point for formulating the other elements of a program and assessing their success.

After establishing appropriate performance criteria, to be effective an onsite wastewater

system management program must include an adequate mechanism to verify the performance of systems. Verification needs to involve a strategy for ongoing system maintenance and assurance of system performance.

In order to assure success, adequate performance-based onsite wastewater system management needs to provide education and training for homeowners, regulators, and those designing, installing, inspecting and maintaining such systems.

There is a need to develop information regarding regional environmental conditions to support development of appropriate performance criteria for differing receiving environments. The program also needs to include a research component, to support the development of appropriate performance criteria and to address issues regarding the design of onsite systems. The research efforts would also support education and training programs.

Finally, there is a need to provide for adequate funding of an onsite wastewater system management program. This includes both a need for adequate resources for state and local agencies involved with implementing the program and a need for realistic financing options for communities or individuals responsible for maintaining onsite systems.

These aspects of an adequate performance-based program are addressed further by the issues and recommendations that follow.

Recommendation #4:
Colorado should strive toward the development of a performance-based approach to onsite wastewater system management that includes mechanisms for the verification of system performance. The approach should take into account varying local resources and needs, and should include adequate education and training, research and funding to support these efforts.

Issue #5: Performance Criteria

As noted above, there is a need to identify the levels of performance that onsite wastewater systems should be expected to achieve in order to provide adequate protection of public health and water quality. Performance criteria provide the necessary reference point for other aspects of the onsite wastewater system management program. For example, new technology can potentially allow an increase in development density and still achieve an acceptable environmental result. There is a need to establish a system for performance criteria to provide an identifiable and consistent measure of what constitutes an acceptable result.

Appropriate performance criteria will vary in different locations, depending on differing receiving environments. For example, the Steering Committee believes that it is appropriate to require a higher level of performance from onsite systems in sensitive environments. Of course, this would require developing a definition of sensitive

environments, as well as performance criteria applicable to each of those environments.

Recommendation #5:
The Department of Public Health and Environment should convene a focused process, with local governments and other interested stakeholders, to develop an appropriate set of performance criteria for onsite wastewater systems in Colorado, tailored to differing receiving environments. It is important that this process also explore options and develop recommendations regarding how to utilize these criteria to transition to a performance-based management system, including consideration of the appropriate state and local roles. For example, once such performance criteria are developed, consideration should be given to the appropriate role of prescriptive requirements for onsite wastewater systems (e.g. specific design and siting requirements) in relation to the performance criteria, and the current variance system regarding prescriptive requirements.

Issue #6: Management Strategies

As noted above, the Steering Committee believes that the principal governmental role for onsite wastewater systems should remain at the local level. A wide variety of management strategies are available, ranging from minimal oversight to more comprehensive programs. For example, EPA's Guidelines for Management of Onsite/Decentralized Wastewater Systems identify the following five management models:

- "System Inventory and Awareness of Maintenance Needs";
- "Management Through Maintenance Contracts";
- "Management Through Operating Permits";
- "Utility Operation and Maintenance"; and
- "Utility Ownership and Management".

Clearly the onsite wastewater system management needs will vary widely within different counties and communities in Colorado. An urbanizing county experiencing substantial growth may have very different needs than a rural county with smaller densities and minimal growth.

Recommendation #6:
The Department of Public Health and Environment, with input from local governments, should review and evaluate available information regarding potential onsite wastewater system management options and make available to counties information about model systems that can be tailored to local needs.

Issue #7: Renewable Permits

One management tool that came up frequently in the Steering Committee's discussions is renewable permits. Much concern has been expressed that once an onsite system is installed, there is no mechanism to assure that it remains functional and is being properly maintained over time. The Steering Committee believes that the best option for providing

such assurance is renewable permits. Issuance and renewal of permits would be based on evidence of acceptable performance and adequate maintenance of the system in question. A renewable permit system may require regulatory and/or statutory changes.

Several variations on a renewable permit system are possible, particularly with respect to identifying the triggering event that would require a permit to be obtained. For example, a requirement could be established to require that all new, expanded, repaired or replacement systems after a specified date obtain a renewable permit. Other options would include: (1) requiring that permits be obtained or renewed at the time of property transfer, (2) requiring permits only for systems within identified problem areas, or (3) requiring that all existing systems obtain a permit by a specified date.

Recommendation #7:
Three steps should be taken regarding renewable permits: (1) the Board of Health should adopt a regulation clearly authorizing local governments to issue renewable permits for onsite wastewater systems; (2) a focused process should be convened, with a full range of interested stakeholders, to develop models for renewable permit systems that address factors such as the appropriate triggering event and the appropriate length of permits; and (3) the stakeholder process should assess whether there are some circumstances in which the state should proactively encourage or require renewal permit systems or alternative mechanisms to assure ongoing maintenance and proper functioning of systems.

Issue #8: Education and Training

The Steering Committee believes that there is a definite need for additional education and training of persons with a role regarding onsite wastewater systems. First, there is a need for additional education of homeowners and owners of small commercial systems regarding the importance of ongoing maintenance of these systems. Informational literature and communication strategies for getting information to system owners need to be developed.

Second, there is a need to provide adequate training of those involved with the regulation and oversight of onsite wastewater systems, the design and installation of such systems, and those involved with inspection and/or maintenance of such systems. The Steering Committee believes that the only proven mechanism for assuring that such training occurs is a certification program. Therefore, development of a certification program for professionals in the onsite wastewater system management field should be explored. Of course, any such certification program could be tailored in terms of its applicability or the scope of requirements based on varying regional circumstances, including, e.g., differences in receiving environments. The state already has in place a certification program for operators of domestic wastewater treatment plants. Certification of professionals involved with onsite wastewater systems would assure a consistent level of qualifications whether such wastes are handled in centralized treatment plants or decentralized, onsite systems. Moreover, experience indicates that without a certification requirement adequate training does not occur.

Recommendation #8:
The Department of Public Health and Environment, working with local governments and other stakeholders, should develop strategies and programs for education and training of persons involved with onsite wastewater system use, regulation, design, installation, maintenance or inspection. These efforts should include development of an appropriate, consistent certification system for professionals in the field, unless an alternative mechanism can be identified to assure that adequate training occurs.

Issue #9: Applied Research

The Steering Committee believes that there is a need for a long-term program of research in Colorado that supports onsite wastewater system science and engineering in the state. Fundamental and applied research is needed to advance the science and engineering of soil-based and alternative onsite and small flows treatment technologies and to enhance the long-term viability of decentralized wastewater system approaches in Colorado. A multidisciplinary program should be designed to quantify and model key hydraulic and purification processes in natural and engineered systems at the single lot to subdivision scales, as well as all the way up to the watershed scale. Research should result in information that can be used for effective system siting, design, installation, operation and evaluation to ensure the cost-effective protection of public health and environmental quality in Colorado. To that end, a research program should also result in materials and facilities that could foster effective education and training of regulators, practitioners, and consumers.

Recommendation #9:
The General Assembly should identify a continuing source of funding to support onsite wastewater system research efforts in Colorado. The Department of Public Health and Environment, working with academic leaders, as well as local governments and other interested stakeholders, should develop a specific proposal regarding ongoing research needs.

Issue #10: Financing

Development and maintenance of an adequate onsite wastewater system program requires adequate financial resources. There is a need for realistic financing options for communities or individuals responsible for maintaining onsite systems, including for repair or replacement of inadequate or improperly functioning systems. Potential options for both low-cost loans and grants should be examined.

Recommendation #10:
The Department of Public Health and Environment should work with local governments and other interested stakeholders to review available options for financing onsite wastewater systems, including single systems and cluster systems in high density areas.

This review should also address both new systems and repair or rehabilitation of existing systems.

Issue #11: Septage Management

"Septage" refers to the liquid and/or solid material removed from a septic tank or other onsite wastewater system that receives only domestic or domestic-type wastes. Concern has been expressed that options for proper septage management in Colorado have been diminishing in recent years. Fewer domestic wastewater treatment plants are accepting such wastes, due to capacity constraints and/or concerns about their ability to meet effluent limitations in their discharge permits. The lack of convenient and economical septage management options discourages appropriate maintenance of onsite wastewater systems and also contributes to increased direct application of septage to rural lands. While legally acceptable if done in conformance with the requirements of the EPA biosolids regulations, this practice often results in nuisance complaints from neighboring property owners.

Recommendation #11:
The Department of Public Health and Environment should work with local governments and other interested stakeholders, including representatives of wastewater treatment facilities, to examine current septage management options and develop a strategy for assuring environmentally sound and economical management alternatives throughout the state.

Issue #12: State Authority

The Colorado Water Quality Control Commission has primary responsibility for the development of a water quality management system in Colorado. However, the State Board of Health is responsible for the adoption of guidelines and rules governing onsite wastewater systems. The Board's focus has historically been on public health concerns associated with onsite wastewater systems, rather than with potential water quality impacts. While the Board and the Commission have cooperated informally in the creation of this Steering Committee, there has been no effort to examine the optimal long-term integration of the roles of these two bodies regarding onsite wastewater systems.

Recommendation #12:
The Department of Public Health and Environment, working with interested stakeholders, should assure that the expertise of both the Board of Health and the Water Quality Control Commission are utilized in regulating onsite wastewater systems to protect public health and the environment. In addition, there should be further clarification or refinement of their respective authorities toward this end.

Issue #13: Follow-up

The Steering Committee believes that it will be important to assure that follow-up occurs to assess progress in addressing the issues and recommendations set forth above.

Recommendation #13:
This Steering Committee should reconvene one year after the finalization and submission of this report to assess the progress that has occurred toward implementation of the above recommendations, and report back to the Board of Health and the Water Quality Control Commission at that time regarding its conclusions.

III. Conclusions and Next Steps

The Steering Committee believes that more can and must be done to facilitate proper utilization of onsite wastewater systems in Colorado to assure protection of public health and water quality, particularly in view of recent and continuing growth and development. A well-considered program to address onsite wastewater systems is an important component of an overall water quality management strategy for the state.

As enumerated above, the Steering Committee is recommending several specific actions to address the issues that have been raised. The critical starting point to facilitate such efforts is the authorization of adequate resources to provide state leadership to address the specific issues described above and thereby assist local governments in Colorado with the implementation of onsite wastewater system management efforts. The feasibility of the remaining Steering Committee recommendations is directly dependent on the procurement of the additional state level resources recommended. Therefore, the Steering Committee believes that implementation of Recommendation #3 is the highest priority and should be completed at the earliest feasible date, but no later than 12 months after the finalization and submission of this report.

The Steering Committee also urges that substantial progress occur with respect to Recommendations #4 through #8 within one year after the creation of the new state-level leadership position. Specifically, the Steering Committee urges that the goals of the first year's efforts include:

- The establishment of new performance criteria;
- The development of model management strategies;
- Authorization for local governments to implement renewable permits, development of renewable permit models and recommendations regarding further renewable permit implementation efforts;
- Initial efforts to advance education and training, including recommendations regarding certification of professionals; and
- The development of a proposal to address ongoing research needs.

The concern about potential impacts of onsite wastewater systems is not unique to Colorado. In recent years there has been increasing recognition nationally of the need to

develop sound programs regarding such systems. The Steering Committee believes that there is a need for Colorado to address this issue proactively and to develop an approach that is tailored to our needs and circumstances. Toward that goal, the Steering Committee urges expeditious implementation of the recommendations set forth above.

Appendix A
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Appendix B
Summary Characterization of Onsite Wastewater System Impacts

The ISDS Steering Committee has agreed on the following summary characterization of the status quo regarding the potential water quality impacts of onsite/decentralized wastewater systems[1], commonly referred to as individual sewage disposal systems (ISDS).

From the available information, it appears that:

1. Water quality impacts are occurring from onsite wastewater systems in a number of specific areas in Colorado. However, the presence and nature of these problems often has not been verified or rigorously documented. In fact, few well-documented studies have been done in Colorado that directly link water quality or health risks with onsite wastewater systems. Examples of identified impacts include elevated nitrate and/or bacteria levels in ground water used for drinking water, and nutrient loadings adversely affecting surface waters. [2]

2. The overall scope and extent of water quality impacts from onsite wastewater systems in most areas of Colorado is unknown. It is possible that additional impacts that have not yet been identified are occurring.

3. Although few site-specific studies have been completed, it appears that substantial cumulative loadings of nutrients to state waters are likely occurring in some areas where there are a significant total number and density of onsite wastewater systems;

    a. There are areas of known nitrate contamination and increased nitrate levels in ground water in areas of high density (lots less than one acre) and a significant number of homes.[3]

    b. In some surface water basins, phosphorus loadings from onsite wastewater systems are a potentially significant water quality factor.[4]

4. The potential risk posed by onsite wastewater systems varies greatly depending on a number of factors. Onsite wastewater systems pose relatively greater water quality risks when:[5]

    a. They are present in high numbers and high density;

    b. They are present in areas served by private drinking water wells that are shallow or poorly constructed;

    c. They are improperly sited, particularly in sensitive environments;

    d. They were installed prior to 1973, when uniform design and siting standards were first established[6]; and/or

    e. When they are not properly designed, installed, operated and/or maintained.

5. Growth trends in Colorado are likely to result in the installation of substantially greater numbers of onsite wastewater systems in the years to come.[7] In some areas of Colorado, it

will continue to be necessary and appropriate to serve homes and/or businesses with onsite wastewater systems, rather than centralized wastewater systems.[8]

6. Properly sited, designed, installed, operated and maintained onsite wastewater systems can function without resulting in adverse water quality impacts.[9]

Footnotes

1. "Onsite wastewater systems" as defined for the purposes of this document consist of pretreatment using a septic tank followed by discharge into aggregate- or chamber-filled trenches or beds from which infiltration and percolation occurs and advanced treatment can be achieved prior to groundwater recharge. It is recognized there are major differences in system siting, design, installation and operation based on a system's geographic location and date of installation. Moreover, there are a variety of new and emerging approaches (e.g. centralized management) as well as devices and technologies (e.g., intermittent sand, foam, or textile filters) that are increasingly being used for onsite wastewater treatment and disposal/reuse.

2. The *Pueblo County Septic Tank Nitrate Study* (Pueblo Regional Planning Commission 1982) documented elevated levels of nitrate-nitrogen in nine areas around Pueblo. Boulder County identified 12 subdivisions with ground water and surface water contaminated by nitrates as reported by the Denver Regional Council of Governments in the *Operation and Maintenance of Sewage Disposal Systems- An Analysis of Alternatives for Shannon Estates in Boulder County, Colorado* (DRCOG 1984). Researchers from Colorado State University identified many mountain homes potentially using bacterial laden well water caused by misplacement of leach fields *(How Safe Is Mountain Well Water,* CSU 1972). Other studies done by the Colorado State University and local health departments document elevated nitrates in groundwater for specific locations. Colorado State University, 1978, 3rd Workshop on Home Sewage Disposal in Colorado Community Management. (July 1978); Colorado State University, 1980, Groundwater Monitoring Strategies to Support Community management of Onsite Home Sewage Disposal Systems. (June 1980); Peterson, T.C. and R.C. Ward. 1987. Bacterial Transport in Coarse Soils Beneath On-Site Wastewater Treatment Systems, Colorado State University.

3. See, e.g., the Pueblo County study referenced in footnote 1, and "Ground-water Quality, West Jefferson County, Colorado. Hydraulic Engineering and the Environment Proceedings, 1973, Biesecker, Hofstra and Hall.

4. Phosphorus loading into several Colorado reservoirs – Dillon, Cherry Creek, Chatfield, and Bear Creek – has caused adverse water quality impacts that have led to the development of Control Regulations to control phosphorus loadings. For example, water quality monitoring in the Bear Creek Watershed over a 15-year period has shown that there is a phosphorus-loading problem in Bear Creek Reservoir. Screening surveys completed by the Bear Creek Watershed Association show elevated levels of phosphorus in areas with a higher density of on-site wastewater systems, such as Idledale. Bear Creek Watershed Association, 1998, 1997 Bear Creek Watershed Association Annual Report. Prepared by Denver Regional Council of Governments, May, 1998; Bear Creek Watershed Association, 1997a, Management Program Review and 1990-1995 Water Quality Summary. Prepared by Denver Regional Council of Governments, January 16, 1998.

5. The potential risk posed by onsite wastewater systems is very dependent on the environmental setting and potential receptors therein as well as the system design and performance. Unacceptable adverse impacts could occur in some settings if wastewater constituents of concern (e.g., nitrogen, bacteria) are not treated to a degree that the percolate from the system(s) reaches a receiving water and the residual pollutant concentrations and/or mass loadings are still high. Information describing the design and performance of onsite wastewater systems and risk-based decision-making may be found in recent publications. Siegrist, R.L., E.J. Tyler, and P.D. Jenssen, 2001, Design and Performance of Onsite Wastewater Soil Absorption Systems, EPRI report no. 1001446, Electric Power Research Institute, Palo Alto, CA; Jones, D.A., A.Q. Armstrong, M.D. Multheim, and B.V. Sorensen, 2001, Integrated Risk Assessment/Risk Management as Applied to Decentralized Wastewater Treatment, EPRI report no. 1001446, Electric Power Research Institute, Palo Alto, CA.

6. In 1973, the Colorado Clean Ground Water Act was adopted, which directed the Board of Health to develop and adopt guidelines regarding onsite wastewater system types, siting restrictions, and local process requirements. Prior to this, there was no uniform basis for the design, siting or installation of these systems.

7. In the four years in which the Colorado Environmental Health Association ISDS Committee has requested information – 1997 through 2000 – the number of new permits issued from reporting agencies has increased from 6,918 permits in 1997 to 8,123 permits in 2001, or a 5% to 6.3% increase per year.

8. USEPA 1997, Response to Congress on Use of Decentralized Wastewater Treatment Systems, USEPA Office of Water, Washington, D.C.

9. Use of onsite wastewater systems without adverse effects on environmental quality or public health has been demonstrated through decades of basic and applied research including field monitoring of single systems at isolated homesites as well as large subdivision-scale applications. Further information on this may be found in Siegrist, et al., 2001 and USEPA, 1997, cited above; USEPA 1978, Management of Small Waste Flows, Report of Small Scale Waste Management Project, University of Wisconsin, Madison, WI, USEPA Municipal Environmental Res. Lab., EPA-600/2-78-173, Cincinnati, Ohio; USEPA1980, Design Manual for Onsite Wastewater Treatment and Disposal Systems, USEPA Municipal Environmental Res. Lab., Cincinnati, Ohio; and Van Cuyk, S., R.L. Siegrist, A. Logan, S. Masson, E. Fischer, and L. Figueroa, 2001, Hydraulic and Purification Behaviors and their Interactions During Wastewater Treatment in Soil Infiltration Systems, *Water Research,* 35(4):953-964.

Appendix C
Preliminary Fiscal Analysis Regarding Proposed New State Position

Steering Committee Recommendation #3 states: *The Department of Public Health and Environment should develop a high priority proposal for the authorization of resources to fund a minimum of one full-time position at the Department of Public Health and Environment, either through cash funds or a combination of cash and general funds. This position would provide state-level leadership to support local government oversight of onsite wastewater systems by addressing the priority issues and needs identified below.*

This Appendix provides a preliminary fiscal analysis regarding the potential establishment of a new full-time position within the Department of Public Health and Environment. This analysis is based on the following assumptions:

- The new position would be either a Professional Engineer I or an Environmental Protection Specialist II. While further analysis of the duties and appropriate classification of this position would be necessary, these two classifications appear to be the most likely options.
- There are currently approximately 7,000 to 8,000 individual sewage disposal system permits issued each year by local governments in Colorado for new onsite wastewater systems. In addition, 1,000 to 3,000 permits are issued each year for repair and replacement of existing onsite wastewater systems. It is assumed that future permit issuance will continue in this same range.

The following two pages of this Appendix provide an initial estimate of position costs over the next two years for a Professional Engineer I or an Environmental Protection Specialist II. These costs range from approximately $83,300 to $91,000 per year.

One option identified by the Steering Committee to provide cash funding for the new position that is recommended would be a surcharge on new onsite wastewater system permits issued by local governments. Based on the above assumptions, the range in size of such a surcharge would be from roughly $8.30 per permit (assuming an EPS II and 10,000 permits issued annually) to $11.40 per permit (assuming a Professional Engineer I and 8,000 permits issued annually). These surcharge levels assume that the new position would be totally cash-funded from this source. Of course, if general funds were available to cover a portion of the cost, the amount of the surcharge would be reduced proportionately.

The Steering Committee offers this preliminary analysis to begin to frame the options for funding a new position. It recommends that other options also be explored. For example, there may be other cash funding options, including, e.g. (1) new development impact fees, and (2) new septage hauling fees. Also, note that if a decision were made to require renewable permits for onsite wastewater systems, the number of permits issued each year would increase and therefore the necessary surcharge to fund a new position would decrease. These and other options warrant further analysis and discussion, including in particular additional input from local governments.

Request 1 FTE - Environmental Protection Specialist II

	FY03 - 7/1/02	FY04 - 7/1/03
Salary	$53,040	$55,798
Fringe	$10,041	$10,563
Total Position Costs	**$63,081**	**$66,362**
Operating*	$3,946	$517
Travel	$1,000	$1,034
Total Direct Costs	**$68,027**	**$67,913**
Indirect Costs	$15,306	$15,280
Total Estimated Costs	**$83,333**	**$83,193**

Assumptions -

*1st year operating costs include, purchase of new computer, desk and start-up supplies ($3,946), 2nd year decreases to $500 plus 3.4% CPI increase.

Salary and fringe costs increased year to year by estimated 5.2 salary survey increase.

Travel costs increased year to year by 3.4% CPI estimate.

Current cash funds indirect rate is 22.5%.

Proposal for ISDS Specialist

Request 1 FTE - Professional Engineer I

	FY03 - 7/1/02	FY04 - 7/1/03
Salary	$58,474	$61,515
Fringe	$10,687	$11,243
Total Position Costs	**$69,161**	**$72,757**
Operating*	$3,946	$517
Travel	$1,000	$1,034
Total Direct Costs	**$74,107**	**$74,308**
Indirect Costs	$16,674	$16,719
Total Estimated Costs	**$90,781**	**$91,028**

Assumptions -

*1st year operating costs include, purchase of new computer, desk and start-up supplies ($3,946), 2nd year decreases to $500 plus 3.4% CPI increase.

Salary and fringe costs increased year to year by estimated 5.2 salary survey increase.

Travel costs increased year to year by 3.4% CPI estimate.

Current cash funds indirect rate is 22.5%.