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FINAL
ENVIRONMENTAL IMPACT STATEMENT

SUPERCONDUCTING SUPER COLLIDER

Volume II
Comment/Response Document
B. Response

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1279.01

On flat to gently rolling terrain, extensively forested areas provide a natural visual buffer between impacted areas and public viewing positions such as along roads or from residential areas. Neither the project feature nor the disturbance of the forest cover would be visible unless the viewing position is within or abuts the feature.

On steeper terrain, the removal of forest cover and the construction of SSC facilities could be more noticeable if the affected slope faces public viewing positions that have an unobstructed line of sight toward the slope.

At the Illinois site, the terrain within or near the collider ring is flat to gently rolling, with some morainal features along the northwest quadrant of the upper arc. The terrain is not forested, so project features would tend to be seen at greater distances without the natural screening afforded by groves of trees.

Significant visual impacts would occur due to some SSC facilities, especially where they are in proximity to residential areas. Where there are existing transmission lines or other light to heavy industrial-appearing facilities, the views have already been compromised and there would be little potential for additional visual impacts due to the SSC facilities. For example, see EIS Volume IV, Appendix 16, Sections 16.3.3.3.B and 16.3.3.3.E.

1279.02

Volume IV, Appendix 16, Section 16.3.3.3 of the EIS presents the scenic and visual resources assessments and mitigation measures. Architectural solutions are included in the description of mitigation measures that should be evaluated during final project design. During that design phase it is expected that some adjustments in siting may occur. Therefore, facility-by-facility mitigation measures must be determined during that phase in order to address the specific views affected. The Illinois proposal that facilities be treated architecturally to appear residential in character or to simulate agricultural structures was acknowledged in EIS Volume IV, Appendix 16, Sections 16.3.3.3.E and 16.3.3.3.H.

Until specific architectural proposals are presented, including bids based on completed working drawings and specifications, the cost effectiveness of architectural treatment cannot be addressed. Moreover, public workshops may be required in order to determine what measures should be applied to address the locally affected public. A more detailed review will be provided in the supplement to the EIS including a discussion of mitigation strategies.

1279.03

If the Illinois site is the selected site, this alternative might be explored during the design phase and preparation of the Supplemental EIS. Technical considerations may preclude optimizing use of Fermilab lands in terms of minimizing impact on farmlands.

1279.04

Volume IV, Appendix 16, Section 16.2.1.1.A of the EIS states: "Without clear trends to the contrary, the baseline condition of the potentially affected landscapes have been presumed to be stable...." In EIS Volume IV, Appendix 5, Section 5.3.13.2.D it is noted that there is a clear trend toward development of agricultural lands for residential uses: "Along the southeastern quadrant and the northern arc, the landscape is transitional between urban/suburban and rural/agricultural character. In these areas there is a mix of land use and farmland is rapidly being supplanted by residential development and other land uses." The consequence of this is that: "In some areas, the juxtaposition of divergent land uses is so complex that in many cases there is no identifiable character...and the SSC project facilities could go unnoticed" (EIS Volume IV, Appendix 16, Section 16.3.3.1).

1279.05

EIS Volume IV, Appendix 16, Section 16.3.3.3.C addresses the visual impact of facility F2 A PUD is a Planned Unit Development, not a Public Utility District. It was not suggested that F2 be included in the PUD in order to have the homes to be built there screen the facility from view relative to the existing homes to the north and west. The proposed site is in the same area as the PUD and would apparently be surrounded by it. It was observed in this section that if this were the case, the PUD would buffer views of F2 from the existing subdivision.

Of primary concern are the views from the existing homes, not the views from homes to be built in the PUD subsequent to a decision to site F2 in this area. The State of Illinois made public its proposed site for the SSC in January 1988. People purchasing homes subsequent to that time are assumed to be knowledgeable about the proposal and not to be moderately or highly sensitive to the appearance of the SSC facilities (see Appendix 5, Section 5.3.13.3.B.) Otherwise, it is assumed that these people would not buy the homes.

Comprehensive mitigation measures are discussed in the referenced section; these include methods to screen the facility from view.

1279.06

The duplication of the four lines noted has been deleted in the Errata and Revisions to Volume IV, Appendix 16.

1279.07

Concerning the first comment item, the EIS discussion (see Volume I, Appendix 16.3.3.2.c) on area F2 addresses the Planned Unit Development (not the Public Utility District). The suggestion that the plans for F2 be integrated with those for the PUD are noted.

The second and fourth items of this comment are addressed in Comment Response 1089.02.

Regarding the third item, the suggestion that the facility be incorporated in a larger, parklike or similar type setting is noted. It and other measures should be evaluated during final project design and in conjunction with development proposals for the PUD.

1279.08

See Comment Response 1089.02.

1279.09

The specifics of mitigation measures cannot be determined until final design, due to the potential for adjustments in siting that may occur because of technical considerations. Berming and landscaping are discussed in EIS Volume IV, Appendix 16, Section 16.3.3.3.C. The comment concerning the use of indigenous plant materials is noted; however, the mix of plant materials may not reflect that occurring in the vicinity given the requirement that landscaping afford screening throughout the year. That is, the amount of evergreens planted, which afford screening in winter as well as summer, may of necessity exceed what is found in the region to achieve the desired result.

Designing sector service area F7 to simulate farm structures was noted as an Illinois proposal in EIS Volume IV, Appendix 16, Section 16.3.3.3.H.

1279.10

EIS Section 16.3.3.3.C of Appendix 16, Volume IV references the Illinois proposal that certain of the Intermediate Access Facilities (E sites) could be made to simulate a small house.

1279.11

See Comment Response 1279.10.

1279.12

For consistency in evaluating the seven site alternatives, the EIS used the Federal definition of prime and important farmland given in 7 CFR 657.5, as stated in EIS Volume IV, Appendix 13.

An Addendum has been made to EIS Section 13.2.4 to clarify this. For consistency, assessment of prime and important farmland impact in Illinois continues to be on the basis of Farmland Protection Policy Act definitions.

1279.13

EIS Volume IV, Appendix 5, Section 5.3.9.2.A.3 has been revised to reflect the suggested clarification.

1279.14

EIS Volume IV, Appendix 5, Table 5.3.9-3 has been corrected in the Errata for Appendix 5.

1279.15

This comment has been incorporated into the Errata to EIS Volume IV, Appendix 5, Section 5.3.9.2.A.3, where the words "are grazed" are deleted.

1279.16

See Comment Response 1279.17.

1279.17

The use of the term "hogs/pigs" is not redundant and does not detract from understanding the text; therefore, the text was not changed. We do agree, however, that the term "heads" of cattle in EIS Volume IV, Appendix 5, Table 5.3.9-5 is incorrect, and have corrected this error in the Errata for Volume IV, Appendix 5.

1279.18

Information on the use of subsurface drainage systems has been added to EIS Volume IV, Appendix 5, Section 5.3.10.3 in the Errata.

1279.19

See Comment Response 1100.02.

1279.20

See Comment Response 1279.21.

1279.21

The background air quality data contained in EIS Volume I, Chapter 4, Table 4-6 should not be used to determine the compliance status of a region. These data were used in air quality model predictions to evaluate the combined impact of the SSC including all other local sources surrounding the SSC. The statement in EIS Volume IV, Appendix 8 makes

reference to the same data in Volume I, Chapter 4, Table 4-6. In this regard there is no inconsistency between EIS volumes. However, an error did appear in Volume I, Chapter 4, Section 4.4.2, (p. 4-26) which has been corrected in the EIS. None of the SSC host Counties (Counties physically hosting the collider complex) in Illinois is currently designated as nonattainment for carbon monoxide. EIS Volume I, Chapter 4, Section 4.4.2 has been corrected.

1279.22

See Comment Response 1279.21.

1279.23

The phrase "as a precursor to ozone" has been added parenthetically after each applicable occurrence of "HC."

1279.24

As noted in Comment Response 1279.261, it is the DOE's interpretation of the Illinois site proposal that one-lane unpaved access roads were not ruled out. Consequently, no change the road construction scenario presented in EIS Volume IV, Appendix 1 was made. From an air pollutant emissions inventory standpoint, the 10 percent unpaved assumption is bounding, and is reasonable, given the high probability that unpaved roads will exist at some point during the construction phase.

1279.25

See Comment Responses 1279.24 and 1279.26.

1279.26

The 14 percent figure used for silt loading was used for calculation of emissions from unpaved roads used by construction vehicles. It is the average given in Section 11.2.1, Unpaved Roads, in AP-42 (Compilation of Air Pollutant Emissions Factors, Volume I, U.S. EPA, Sep. 1985) for silt content of material on roads used by stone quarrying and processing operations. The silt loading factor used for determining emissions from paved roads from construction traffic was the factor for Local Streets from Section 11.2.5, Paved Urban Roads, in AP-42. Both the silt factor for unpaved roads and the silt loading factor for paved roads provide a bounding estimate of fugitive dust generated by construction vehicle traffic on roads.

1279.27

Measurements of PM_{10} concentrations were conducted in all states to establish background information for the PM_{10} standard initiated in 1987. These data have not all gone through the required EPA quality control review, and thus they must still be considered as unconfirmed. Air quality data which were received from a SSC siting proposal, but were unverified, would not be used in the EIS.

125113003358841

The requirement that modelers use five consecutive years of meteorological data from a nearby National Weather Service (NWS) station or one year of on-site meteorological data is in effect for air pollution sources applying for a PSD permit. Since the air pollutant emissions from the SSC during operations are not large enough to require a PSD permit, only one year of NWS meteorological data from each site was used to model the comparison of air pollutant concentrations produced by construction and operations of the SSC. Further analysis will be conducted in the preparation of the Supplemental EIS. Also the permitting process and coordination with EPA and State agencies will be begun following site selection.

1279.28

The reported 1-h values for carbon monoxide were in error in the DEIS. The SSC impact should have read 1175 which when added to background of 8,300 totaled 9,475. Volume I, Chapter 5, Table 5.1.3-3, and Volume IV, Appendix 8, Table 8-25 have been revised in the FEIS.

1279.29

Greater detail on the presence of prairie in Illinois is presented in EIS Volume IV, Appendix 5, Section 5.2.8. The text correctly indicates that the seven prairie remnants in the vicinity of the proposed SSC alignment are on non-protected lands, including waste industrial lands, railroad right-of-ways, and cemeteries. There are no known natural original prairie remnants at Fermilab, although extensive prairie restoration is being accomplished.

1279.30

Suggested changes have been made to the text in Volume I, Chapter 4, Section 4.7.6.

1279.31

The prairie restoration at Fermilab is an ongoing activity, and ultimate success of the project can only be measured in the long term after continued vegetative persistence and evidence of prairie system maintenance without extreme levels of human intervention. The text has been changed to reflect the restoration's activities and short-term success. (See EIS Volume I, Chapter 5, Section 5.1.5.3)

1279.32

The EIS incorrectly indicated the number of prairie remnants in the SSC area. Text revisions have been made in EIS Volume I, Chapter 5, Sections 5.1.5.3 and 5.2.8 and in Volume IV, Appendix II, Section 11.3.3.1 to show that only seven prairie remnants are located within the 16-township area.

1279.33

If Illinois is chosen as the SSC site, habitat improvement measures could be implemented, and habitats for wildlife may, in turn, increase. EIS Volume I, Chapter 5, Section 5.1.5.4.C has been revised to reflect the more accurate appraisal in Volume IV, Appendix 11, Section 11.3.3.4.

1279.34

See Comment Response 1279.32.

1279.35

The entire paragraph has been deleted from EIS Volume IV, Appendix 5, Section 5.3.9.2.A.1.a in the Errata for Appendix 5.

1279.36

The terminology used in EIS Volume IV, Appendix 5 accurately describes the vegetation present at the site and has not been revised.

1279.37

The terminology used in EIS Volume IV, Appendix 5, Section 5.3.9.2 is only descriptive of the vegetative characteristics of the wetlands found in this area and does not affect the analysis of impacts.

1279.38

Information consistent with the comment about hunting leases in northeastern Illinois has been inserted in the text of EIS Volume IV, Appendix 11, Section 11.3.3.4.

1279.39

EIS Table 5.3.9-6 has been revised. See Errata for Volume IV, Appendix 5.

1279.40

The information on birds potentially present at the Illinois SSC site was included for descriptive purposes and is believed to be adequate for site selection. Should Illinois be the selected site, and if appropriate, more detailed information would be collected for inclusion in the Supplemental EIS. Consequently, no change in the ranking system, abundance or listing of permanent residents has been made. "Wild turkey" has been deleted from EIS Volume IV, Appendix 5, Table 5.3.9.7. This correction appears in the Errata for Volume IV, Appendix 5.

1279.41

See the Errata for EIS Volume IV, Appendix 5, for changes that have been made. The pied-billed grebe is not a game bird in Illinois.

125113003358843

1279.42

The term "migratory" has been deleted from EIS Volume IV, Appendix 5, Table 5.3.9-11, even though several of the fishes do migrate. This change will appear in the Errata for Appendix 5.

1279.43

See Comment Response 1279.44.

1279.44

As stated in EIS Volume IV, Appendix 9, Section 9.2.2.1.C.2, the details of the blasting plan will be set during final design, when the actual subsurface conditions, methods of construction, and proximity of the construction site to nearby buildings and people are known. This more detailed review will be provided in the Supplemental EIS.

1279.45

As noted in Volume IV, Appendix 5, Section 5.3.5, only recorded vibration results were tabulated. The Illinois State Geological Survey unpublished report associated with this monitoring (Rock Motion Measurements Beneath Truck and Train Traffic Within the Super Collider Site, Wiss, Janney, Elstner Associates, Inc., 1988) reports recorded vibrations for vehicle traffic.

1279.46

The referenced document (RI 8896) is based upon "effects of repeated blasting," such as at a mine or quarry, while the EIS is based upon the effects of temporary blasting associated with construction. When blasting is taking place near the surface, the more restrictive control for charge-weight-per-delay is for airblast overpressure, as your example proves.

1279.47

See Comment Response 1279.44.

1279.48

EIS Volume IV, Appendix 9, Section 9.2.3.3.B.1 of the EIS has been revised to reflect the preconstruction inspection program of the "good neighbor" legislation, by inserting the following paragraph:

"Legislation has been enacted in Illinois to provide for preconstruction inspection of buildings within the sphere of influence, monitoring vibrations attributed to blasting, and providing compensation for any structural damages attributed to blasts."

1279.49

The "Technical Comments DMM 019 and DMM 020" referenced in the comment were not included in the transmittal to the DOE. Therefore, it is not possible to comment on the concern.

1279.50

See Comment Responses 904.01 and 1276.01 regarding secondary impacts of relocations.

1279.51

See Comment Response 981.03.

1279.52

The EIS Volume IV, Appendix 2, Section 2.4.2.2 makes note of the special adjustments for the Illinois site which took into account the existing facilities at the Fermilab Tevatron and the resultant cost savings.

The $316-million allowance for tunnel construction funded by the State of Illinois was not included in the cost estimate.

Interest expense was not included in the life cycle cost estimates.

1279.53

Any potential savings of some fraction of the estimated decommissioning cost of $0.038 billion would not be considered significant when compared to the $4.477 billion average site-specific construction cost at one of the seven site alternatives.

The DOE will prepare a detailed decommissioning plan when the decision is made to decommission the facility.

1279.54

EIS Volume I, Chapter 3, Table 3-7, has been corrected to reflect the total numbers of cultural resources identified up to the BQL submission within each of the proposed SSC sites. These quantities do not state how many resources are eligible for listing on the National Register. They are based on data provided by the States and reflect the varying intensity of study performed prior to submission of data to the DOE; studies range from records reviews only to reconnaissance surveys to intensive surveys. Extensive surveys have been undertaken only in Illinois and Arizona, although portions of these sites remain to be completed. Historic building surveys of defined impact areas have been completed in Illinois, Michigan, Arizona, and Tennessee.

Evaluations of the known cultural resources pertaining to the Illinois SSC site have not been documented.

After the final SSC site is selected, cultural resource surveys would be completed as necessary. Sites would be evaluated for significance by applying eligibility criteria for the National Register. If the Illinois site is selected, the DOE and the Illinois State Historic Preservation Officer will develop mitigation measures, including avoidance where feasible, to mitigate adverse impacts on significant cultural resources (see EIS Volume IV, Appendix 15, Section 15.1).

1279.55

EIS Volume I, Chapter 4, Section 4.10.2.1.C has been revised as suggested.

1279.56

All of the lithostratigraphic units noted in EIS Volume I, Chapter 4, Section 4.10.2.1.C are described in EIS Volume IV, Appendix 5, Section 5.3.1.2. Also, Figure 5.3.1-4 in Appendix 5 displays the surface distributions of these units. As described in EIS Volume IV, Appendix 5, Section 5.3.12.2.B, paleontological materials have been identified in many of these units.

1279.57

EIS Volume I, Chapter 4, Section 4.10.2.2.C has been revised to indicate that the eastern and southern parts of the ring have some high probability of surface areas with paleontological resources. This appears consistent with the paleontological assessment found in EIS Volume IV, Appendix 15, Section 15.2.3.3. EIS Volume I, Chapter 4 discusses the affected environment at the Illinois site; the comment on mitigation is not applicable to the Chapter 4 presentation. However, it is also consistent with the discussion found in Volume IV, Appendix 15, Section 15.2.3.3. concerning mitigation of impacts to the paleontological resources.

1279.58

The DOE contacted the Native American communities listed on EIS pp. 99-100 of Appendix 15. However, this comment correctly describes the responses to the Illinois State Museum inquiries.

EIS Volume I, Chapter 5, Section 5.1.9 is revised to note that in response to Illinois State Museum inquiries, the Citizen Band Potawatomi Indians of Oklahoma have stated that Native American burials may be located in the general vicinity of the proposed Illinois SSC site, but that no specific locations were identified.

If Illinois is chosen as the selected site, more detailed mitigation planning will be included in the Supplemental EIS.

1279.59

Comment noted. Volume I, Chapter 5 has been revised accordingly.

1279.60

This information has been added to Volume IV, Appendices 5 and 15, as Errata.

1279.61

The proposed changes have been made in the Errata and Revisions of the EIS.

1279.62

Presumably this comment refers to the discussion of known cultural resources (EIS Volume IV, Appendix 15, Section 15.1.3.3.A.3) which summarizes the information provided to the DOE pertaining to the Illinois SSC site.

Table 15-4 indicates that an extensive archaeological survey has been completed to date, although no percentage of surveyed lands is stated. Several portions remain to be surveyed including yet to be defined areas of ancillary construction activity. Pertaining to historic buildings, it is stated that "all incorporated rural sections of the 16-Township area have been systematically surveyed for architectural and historic buildings." Further, it is stated that, "Many of the proposed project construction areas have undergone intensive cultural resource surveys as indicated by the tables in the previous sections. Historical buildings surveys are complete". It should be noted that the identification of historic archaeological sites is currently underway by the Illinois State Museum, but it is not complete.

Table 3-7 in Volume I, Chapter 3 is incorrect in the DEIS and has been revised to accurately describe the number of known cultural resources located in defined potential impact areas.

The additional information cited in the comment which was provided by the Illinois State Museum was not useful for the level of presentation in the EIS. This information would be important for future evaluative purposes.

Finally, although the data provided to the DOE by the Illinois State Museum are indicative of quantities of cultural resources in the defined project area, information was not provided to evaluate resource significance (National Register eligibility) or the nature and extent of potential impacts. It is the DOE's understanding that such evaluations are underway by the Illinois State Museum. If the DOE selects the Illinois SSC site, cultural resource surveys and evaluations would be completed and, in accordance with a Memorandum of Agreement between the DOE and the Illinois State Historic Preservation Officer, mitigation measures would be developed to mitigate, where necessary, impacts on

significant cultural resources. These findings would be presented in the Supplemental EIS.

1279.63

This correction is noted and has been included in the Errata for Appendix 15.

1279.64

The data in EIS Volume IV, Appendix 15, Table 15-4 correspond to the information provided by the Illinois State Museum pertaining to the quantities of known archaeological sites associated with defined project facilities locations. According to that information, 55 sites are located within the proposed collider ring alignment (P-ring). The sites located in the "candy stripe" and "corridor 5" are indicative of other cultural resource locations which could be vulnerable if the project footprint were modified. Thus, there is a total of 78 known sites in the project area which could be impacted depending on the final alignment.

EIS Volume I, Chapter 3, Table 3-7, has been corrected to read 55 archaeological sites, the number of known sites within the proposed collider ring.

1279.65

EIS Volume IV, Appendix 15, Table 15-5 corresponds to Table VI-2 provided in the State of Illinois Site Proposal (Chapter VI: Archaeology, History and Paleontology). There are 171 known sites along the proposed collider ring alignment, although 62 sites are located in the easement and not necessarily subject to indirect impacts. Historic structures located in the "candy stripe" and "Corridor-5" are also outside indirect impacts as currently defined. The quantities and locations of these structures indicate potential impacts if the proposed alignment is modified.

1279.66

The State of Illinois originally proposed 46 quarries as disposal sites as part of its proposal (September 1987). Later submittals proposed the use of four quarries as disposal sites. The EIS is based on the later submittals (see EIS Volume IV, Appendix 10, Section 10.2.3.3.A).

It has been noted that the disposal of dolomite (generated by the SSC project) at the Fox River Stone Quarry would require consultation with the Illinois Department of Mines and Minerals.

1279.67

See Comment Response 1279.66.

125113003358848

1279.68

See Comment Response 1279.273.

1279.69

As described in EIS Volume IV, Appendix 10, the State of Illinois has recommended the disposal of excavated material in four quarries. These quarries would stockpile the excavated material and gradually blend it with their own produced material and sell the combined product. The usage of material for parking lots, roads, and as aggregate for concrete would be studied in more detail if the Illinois site is selected. The usage of material would depend on the suitability of the material.

1279.70

It is assumed that the commenter's concern is regarding the worker safety aspects of disposal of tunnel spoils at the proposed Illinois site. The SSC construction contractor would take the appropriate precautions to ensure the occupational health protection of workers who are involved in the tunneling spoils disposal operation. These safety precautions will be outlined in the contractor's Safety Analysis Review (SAR) that will be prepared prior to the start of construction.

1279.71

See Comment Response 1279.81.

1279.72

"Spoils disposal areas" referenced in EIS Volume I, Chapter 5, Section 5.6.2-1 refers to the temporary excavated material storage area. However, the text is now revised to avoid confusion.

1279.73

See Comment Response 1279.69.

1279.74

See Comment Response 1279.66.

1279.75

See Comment Response 1279.69.

1279.76

See Comment Response 1095.02. In addition, the EIS considered the use of only four quarries as proposed by the State of Illinois. The use of additional quarries could serve to reduce peak spoils disposal truck traffic on some roads. However, it might increase traffic on other

roads. If Illinois is the selected site, final spoils disposal alternatives would be examined in the Supplemental EIS and would examine a variety of quarries for use.

1279.77

See Comment Response 1279.80.

1279.78

It is estimated that about 960 yd^3/24 hour excavated material could be generated near each shaft. It would require 48 truckloads per 12-hour period to haul 960 yd^3, assuming 20-yd^3 capacity trucks are used. Storage space near each shaft is provided for a 72-hour excavation period.

Other mitigative measures could be considered during the detailed design phase to avoid or to minimize the impacts of disposal of excavated material if required.

1279.79

See Comment Response 1279.69.

1279.80

See Comment Response 1279.69.

1279.81

The State of Illinois originally proposed 46 quarries as disposal sites in their proposal (September 1987). They have since revised their plans and have proposed the use of four quarries as disposal sites. The EIS is based on the later proposal.

Since the time of the revised proposal, the State has identified several more prospective disposal sites. The final disposal plan will be developed during final design if the Illinois site is selected.

1279.82

The collider tunnel will be within the saturated zone; however, as noted in the comment, host rock permeability at tunnel depth is generally quite low. The Galena-Platteville Group is not a water supply aquifer in the site vicinity (see EIS Volume IV, Appendix 5, Section 5.3.2).

1279.83

EIS Volume 1, Chapter 4, Table 4-1 has been clarified as suggested.

1279.84

EIS Volume I, Chapter 4, Table 4-1 has been corrected.

1279.85

The occurrence and origin of drift gas are described in EIS Volume IV, Appendix 5, Section 5.3.1.5. Coleman (1976) termed these natural gas occurrences "drift-gas deposits" to be consistent with local usage and to emphasize that they are limited to, and probably originated in, the glacial drift. Kempton (1988) uses the term "bacterial gas" to indicate their probable biogenic origin.

1279.86

EIS Volume I, Chapter 4, Section 4.1.1 notes that the hills are also glacial deposits.

1279.87

EIS Volume I, Chapter 4, Section 4.1.2. has been revised to include Illinois as one of the sites with fewer deformed sediments.

1279.88

Comment noted.

1279.89

EIS Volume I, Chapter 4, Section 4.1.3. has been clarified as suggested.

1279.90

The data indicating the presence of faults, and the characteristics of the faults, are discussed in Volume IV, Appendix 5, Section 5.3.1.3. Discussion of these faults possibly being folds is not presented in the EIS, because present data presents them as speculative.

1279.91

The structures are accurately described as broad, open folds with shallow-dipping limbs; as is illustrated in EIS Volume IV, Appendix 5, Figure 5.3.1-5.

1279.92

The lowest values of permeability reported for clay-rich till are based on field experiments at landfill sites near the Illinois SSC site; the subject is discussed in more detail in EIS Volume IV, Appendix 5, Section 5.3.2.2.

1279.93

The description is correct as originally written, and provides detail needed to understand the sentence that follows it.

1279.94

This information is consistent with that in EIS Volume I, Chapter 4, Section 4.1.6. A few small occurrences of drift gas have been used for domestic supplies in the site vicinity (Kempton 1988). See Comment Response 1279.85.

1279.95

EIS Volume IV, Appendix 5, Section 5.3.1.6 has been corrected in the Errata as suggested.

1279.96

EIS Volume IV, Appendix 5, Table 5.3.1-1 has been corrected in the Errata as suggested.

1279.97

EIS Volume IV, Appendix 5, Section 5.3.1.1. has been corrected in the Errata as suggested.

1279.98

The legend of EIS Volume IV, Appendix 5, Figure 5.3.1-1 has been corrected in the Errata.

1279.99

EIS Volume IV, Appendix 5, Figure 5.3.1-2 has been corrected in the Errata as suggested.

1279.100

See Comment Response 1279.96.

1279.101

See Comment Response 1279.96.

1279.102

The referenced passage (EIS Volume IV, Appendix 5, Section 5.3.1.3) is an inventory of structures in the site region. No implied relative significance is intended in this passage; therefore, it would be inappropriate to avoid mention of the Oswego syncline.

1279.103

To ensure the presentation of a fair comparison of the geology of each site, to the greatest extent possible, similar formats (e.g., similar content, scale, and vertical exaggeration) are used for all of the discussions of structural geology in EIS Volume IV Appendix 5 (see Section 5.3.1 for Illinois site Earth Resources discussion). Data availability, though not identical from site to site, was adequate to assess potential impacts.

1279.104

Comment noted.

1279.105

The alternate tunnel has been deleted from the legend of EIS Volume IV, Appendix 5, Figure 5.3.1-5.

1279.106

EIS Volume IV, Appendix 5, Table 5.3.1-2 has been corrected in the Errata as suggested. "Lean" refers to low-plasticity clay, as opposed to sticky clays of high plasticity, which are termed "fat."

1279.107

EIS Volume IV, Appendix 5, Table 5.3.1-3 has been revised to include unconfined compressive strength values measured with a penetrometer (see Errata).

1279.108

EIS Volume IV, Appendix 5, Table 5.3.1-4 has been corrected in the Errata.

1279.109

The discussion in EIS Appendix 5, Section 5.3.1.4 has been clarified as suggested.

1279.110

EIS Volume IV, Appendix 5, Section 5.3.1.5 has been corrected in the Errata as suggested.

1279.111

The symbol for past coal producers in the legend of Figure 5.3.1-6 of EIS Volume IV, Appendix 5 has been removed in the Errata.

1279.112

EIS Volume IV, Appendix 6, Section 6.3.3.2 has been corrected in the Errata as suggested.

1279.113

Data reported in EIS Table 10.1.3.2 was derived from Volume IV, Appendix 5, Table 5.3.1.4. This table reported bulk density for bedrock as "ND", no data available. Examining closely the three references referred to in the comment, it was still not possible to derive the bulk density of rocks in the Illinois site without making some assumptions. By assuming the moisture contents were measured in a saturated condition and expressed as percent of dry weight, the calculated average bulk density was 2.43 g/cm^3 for Table 7 (EGN 120) and 2.46 g/cm^3 for Table 10 (Harza/ISGS Geotechnical Report), respectively. The bulk density for rocks used to calculate the penetration radiation dose is 2.4 g/cm^3 (EIS Volume IV, Appendix 10, Table 10.1.3-2). The bulk density value used is very close to the derived value and allows some conservatism in estimating penetration radiation dose.

1279.114

See Comment Response 979.02.

1279.115

A considerable variety of opinion has been expressed regarding groundwater use, groundwater overdraft, and groundwater use replacement by surface water in the vicinity of the proposed Illinois SSC site. This is probably due to the fact that there are a number of water supply sources available and used, and the level of population and water use in the area, i.e., a relatively diverse and somewhat complex situation.

There are four definable and utilized aquifers in the vicinity of the proposed Illinois SSC site. These are: (1) glacial deposits; (2) shallow bedrock or Silurian dolomite aquifer; (3) deep sandstone or Cambrian-Ordovician aquifer; and (4) basal bedrock or Mt. Simon aquifer. The glacial deposits are a variable source of groundwater, but for the area as a whole are a significant source of groundwater and are not presently overdrafted. Recharge to this unit in northern Illinois is estimated to range from about 100 to 400 acre-ft/yr/mi^2.

The shallow bedrock, or Silurian dolomite aquifer, is a significant water supply source in the eastern portion of the site, but is presently overdrafted only locally in portions of DuPage County. The deep sandstone, or Cambrian-Ordovician aquifer, is regionally overdrafted. It has been historically and is currently a major water supply source for the municipalities along the Fox River and to the east of the proposed SSC site. Water levels have declined significantly in areas of heaviest use (primarily to the east of the site) but the aquifer is still a major and viable water supply source. The basal bedrock, or Mt.

Simon aquifer, is at a significant depth and is developed primarily to the east of the site, in the Chicago area. It is not a major water supply source or a water supply option in the immediate SSC site vicinity.

The type of groundwater use from each of the aquifers can be characterized: the glacial and shallow bedrock aquifers are developed primarily by individual domestic wells with some minor municipal supply use from the shallow bedrock; the deep sandstone aquifer is developed primarily for municipal supply, however, a relatively significant number of domestic wells tap this unit, especially in the western portions of the area where the shallow bedrock aquifer is generally absent; the basal bedrock aquifer is developed almost exclusively for municipal supply to the east of the proposed SSC site, and domestic use is limited, if not nonexistent, due to the significant depth of the aquifer.

It is important to note that the deeper confined aquifers are relatively unaffected by drought conditions, at least on an annual or short-term basis. The glacial and shallow bedrock aquifers may be affected quite noticeably; however, in that an annual or multiple-year drought can result in changes in water levels of several feet. This is a natural response to the temporary decline in annual recharge to the aquifers; Pumpage from the aquifers obviously magnifies the effect.

The general water supply condition in the vicinity of the proposed Illinois SSC site has been described in EIS Volume IV, Appendix 5, Sections 5.3.2.1 and 5.3.2.2. In essence, there are extensive groundwater resources in the area. There is a localized and regional groundwater overdraft due to long-term and heavy municipal supply pumpage from the deep sandstone and locally from the shallow bedrock aquifer. The shallower groundwater units within the SSC site vicinity that are developed for individual domestic supply are prone to noticeable variations in water levels resulting from drought/ precipitation cycles and existing pumpage.

The status of municipal water supply is an issue that is changing in the local area. Communities far to the east near Lake Michigan began a partial conversion to Lake Michigan water several years ago. It is presently indicated by the State that some 30 communities in DuPage County, generally to the east of the site, have committed to plans for delivery of 96,473 acre-ft/yr of Lake Michigan water by 1992 and 115,404 acre-ft/yr by 2000. The potential reduction in groundwater pumpage from the deep sandstone aquifer would reduce the regional overdraft of this aquifer but most of the reduction would be to the east of the site. Some communities along the Fox River have begun to diversify their water supply: Elgin presently obtains about half of its water supply from the Fox River; Aurora is planning to diversify its sources and obtain water from the Fox River, the glacial and shallow bedrock aquifers, and the deep sandstone aquifer. A trend toward diversification of water supply sources by local municipalities will reduce the overdrafting of the deep sandstone aquifer while increasing use of the presently underdeveloped

glacial and shallow bedrock aquifers. This increased use has the potential to conflict with the present heavily domestic use of the shallow aquifers and thus must be managed carefully.

Given the available information and present knowledge of possible changes in water supply conditions in the SSC site vicinity in Illinois, a measurable water level/overdraft impact due to SSC direct and indirect water use during operations is projected based on the definition of a measurable impact (EIS Volume IV, Appendix 7, Section 7.2.2). A variety of mitigations can or may be implemented which could reduce or minimize impact. These include transfer of some municipal usage to Lake Michigan surface water, and diversification of municipal groundwater pumpage to include more use of the glacial and shallow bedrock aquifers in the vicinity of the SSC site.

Text has been revised in EIS Volume I, Chapters 3 and 5, and Volume IV, Appendix 7, Section 7.2.3.3 to provide an expanded discussion of mitigations for groundwater use impacts.

1279.116

See Comment Response 979.02.

1279.117

See Comment Response 1279.115.

1279.118

See Comment Response 1279.115.

1279.119

The text of EIS Volume I, Chapter 4, Section 4.2.2.1 has been revised in accordance with the comment.

1279.120

Comment noted.

1279.121

The depth-to-water in EIS Volume I, Chapter 4, Table 4-3 has been corrected to indicate a range from 5 to 20 ft as stated in the State of Illinois proposal and in EIS Volume IV, Appendix 5, Section 5.3.2.2.A.1.

1279.122

The entry for piezometric conditions in the glacial drift at the Illinois site in EIS Volume I, Chapter 4, Table 4-3 has been revised to correspond with the text in Section 4.2.2.1.

1279.123

EIS Volume I, Chapter 4, Table 4-4 has been completely revised. The reference to the Pierre Shale (typographical error) has been removed.

1279.124

See last paragraph of Comment Response 979.02.

1279.125

See Comment Response 1279.115.

1279.126

See last paragraph of Comment Response 979.02.

1279.127

The referenced spelling errors have been corrected in the Errata to EIS Volume IV, Appendix 5, Section 5.3.2.2 and the references.

1279.128

The text of EIS Volume IV, Appendix 5, Section 5.3.2.2 has been corrected in the Errata as indicated in the comment.

1279.129

The thickness of the Galena-Platteville group has been corrected in the Errata for EIS Volume IV, Appendix 5, Section 5.3.2.2.A.3 to range from 300 to 380 ft according to Graese et al. (1988).

1279.130

The text and Table 5.3.2-4 in EIS Volume IV, Appendix 5, Section 5.3.2.2 have been corrected in the Errata to indicate 10^{-4} to lower than 10^{-6} cm/sec hydraulic conductivities in the upper bedrock aquifer.

1279.131

No revision to EIS Volume IV, Appendix 5, Section 5.3 is necessary, since it is generally understood among hydrogeologists that when no directional qualifier (i.e., horizontal, vertical, or other direction) is identified, that (1) hydraulic conductivity applies to the horizontal direction, and (2) the hydraulic conductivity may be different in other directions (i.e., may be anisotropic).

1279.132

EIS Volume IV, Appendix 5, Section 5.3.2.2 has been revised to reflect the recharge of the Cambrian-Ordovician aquifer as stated in this comment.

1279.133

The wording has been corrected in the Errata for EIS Volume IV, Appendix 5, Section 5.3.2.2.A.5 as suggested.

1279.134

In EIS Volume IV, Appendix 5, Section 5.3.2.2, the recharge rate of 250 acre-ft/yr/mi^2 is an average of the range derived from references listed earlier in that section.

1279.135

See Comment Response 1279.115.

1279.136

See Comment Response 1279.115.

1279.137

Comment noted.

1279.138

See Comment Response 1279.115.

1279.139

In EIS Volume IV, Appendix 7, Section 7.2.3.3.A.5, the 1985 municipal water use reported is for Kane County plus only the western part of DuPage County (not all of DuPage County, as reported for 1986 in the preceding paragraph). Also, available references indicate that most of the water used in these counties, including municipal supplies, is from groundwater sources (see Volume IV, Appendix 7, Section 7.1.3.3).

See Comment Response 979.02 with respect to the potentially affected wells.

1279.140

See Comment Response 1279.115.

1279.141

The initial rate of water inflow into the majority of the tunnel, as indicated by the Illinois proposers, will range from 0.2 to 10 gal/min/100 ft of tunnel. This inflow will be coming principally from a number of fractures in the rock; in carbonate rocks like those of the Galena-Platteville Group, the water has to move through fractures, since sound rock has negligible water-transmitting capability. A few isolated highly fractured zones may yield still higher flows of water (see Comment Response 1279.357).

Some commenters have interpreted the 0.2 to 10 gal/min/100 ft inflow rate to represent a continuing, long-term rate of inflow; it is not. The initial rate of inflow is the rate at which water enters the tunnel when the tunnel boring machine (TBM) first passes through the rock. A grouting crew follows closely behind the TBM to plug or grout fractures from which water is flowing. They do this by drilling a hole into the tunnel wall so it intercepts the fracture. They next force cement (under high pressure) into the drillhole and outward along the fracture to literally cement the fracture closed and stop it from transmitting water. (The cement impregnates only a small zone of rock immediately around the tunnel, so it does not change groundwater flow patterns in the aquifer nor affect yields of water wells.) On a first-pass grouting campaign, water inflows are easily reduced to one-tenth of the initial inflow rate. If too much water is still entering the tunnel to suit the purpose of a particular project, additional grouting campaigns are done until water inflow is reduced to very low, acceptable rates. In short, at any point during the tunnel excavation, the initial flow rate will be experienced only over a tunnel length of 100 ft or less -- this is the length of tunnel immediately behind the advancing TBM that has not yet been grouted. The remainder of the tunnel will already have been grouted so that the inflow will be reduced to a very low rate. The long-term rate is much less than the initial rate and can be made as small as necessary by further efforts. Grouting campaigns will reduce the overall average inflow to approximately 0.5 gal/min/100 ft of tunnel. This low residual inflow could be used for cooling water or other purposes, or could be permitted and reinjected or discharged. Every effort will be made to avoid simple discharge of the residual inflow.

1279.142

The DOE agrees with the comment that an initial inflow rate of 5,200 gal/min/100 ft is an exceedingly conservative overestimate. The DOE also agrees that long term inflow, after treatment by grouting, will be small enough not to be a problem. This is discussed in Comment Response 1279.357.

1279.143

See Comment Response 846.02.

1279.144

See Comment Response 846.02.

1279.145

See Comment Response 846.02.

1279.146

It is true that the number of miles traveled in spoils hauling could be reduced by using more disposal sites. However, the reduction would not materially affect the conclusions of the health and safety discussion. If Illinois is selected as the site, this option will be discussed in greater detail in the Supplemental EIS. See also Comment Response 1279.81.

1279.147

The DOE requires that Fermilab use a competitive bidding process in contracting for disposal of hazardous waste, but does not require that it "be shipped to various sites around the nation for proper disposal." The comment regarding current generation of hazardous wastes at Fermilab and the procedures to handle these wastes is noted.

1279.148

See Comment Response 846.02.

1279.149

See Comment Response 846.02.

1279.150

See Comment Responses 710.01, 880.04, and 1279.151.

1279.151

The DOE believes the comparisons of impacts represented in the EIS Volume I, Chapter 3, Section 3.4 concerning relocation are sufficient to adequately summarize site alternatives.

1279.152

The DOE believes the analysis offered in Table 4-2 is adequate for the purpose of this EIS which is to select a site for the SSC.

1279.153

The parcel maps that did not include the locations of sites E8, E9, F8, F9, L2, J1, J2, J3, and J4 have been revised and are included in the addendum to EIS Volume IV, Appendix 4.

125113003358860

1279.154

See EIS Volume IV, Appendix 5, Section 5.3.10.1.D. Local level planning activities include the preparation of comprehensive land use plans. Land use planning at the State level is conducted for State-owned property.

1279.155

EIS Volume I, Chapter 1, Section 1.4 has been revised to reflect the suggested change.

1279.156

Even though many parallels can be drawn between the SSC Project and Fermilab, the two projects differ noticeably in terms of project scale and the amount of land acquisition required. While it was possible to institute a prairie restoration program at Fermilab, given the area's Federal ownership, this may not be the case for the SSC project. As a result, it is incorrect to assume that by siting the project in Illinois, current development trends could be altered such that parks and natural areas will automatically occur. By the same token, it is incorrect to assume that the SSC can be viewed essentially as a Federal park by the general public.

1279.157

Comment noted. See Comment Responses 275.04 and 1204.02.

1279.158

See Comment Response 1279.03.

1279.159

EIS Volume I, Chapter 4, Table 4-20 has been revised to reflect the suggested correction.

1279.160

EIS Volume I, Chapter 1, Section 1.4 has been revised to reflect the intent of the comment.

1279.161

The revised EIS Volume I (Chapters 3 and 4) identifies the prime and important farmland acreages as provided by the Soil Conservation Service. The Fermilab property, currently under a lease back program to farmers, will not be reflected in these figures because this land was previously removed from the State's farmland inventory when Fermilab was constructed. See Comment Response 1279.181.

1279.162

See Comment Response 1279.151.

1279.163

Acreage figures regarding area to be disturbed have been revised throughout the text. Construction of the SSC would disturb a total of 494 acres in Illinois. Of these, 227 acres would be permanently disturbed by buildings and support facilities (EIS see Volume I, Chapter 3, Table 3-2).

1279.164

The EIS Volume IV, Appendix 13, Section 13.1.2.1.A.2 provides a discussion of the spatial definitions used in the land use analyses and impact assessments. This includes a definition of local scales of analysis which are meant to be site-specific for the various SSC facilities planned. As a consequence, it is inappropriate to make the suggested change as the next higher order level of analysis, i.e., the regional level already addresses the concerns raised. See Comment Response 1279.324 for a discussion of the "one-campus" alternative.

1279.165

EIS Volume I, Chapter 5, Section 5.1.7.1.C has been modified to reflect the suggested clarification.

1279.166

The suggested change is included in the Errata to EIS Volume IV, Appendix 5, Section 5.3 of the EIS.

1279.167

The description of the Fox River Greenbelt has been corrected in the Errata for EIS Volume IV, Appendix 5, Section 5.3 as suggested.

1279.168

These changes are included in the published Errata for EIS Volume IV, Appendix 5, Section 5.3, as suggested.

1279.169

The text in EIS Volume IV, Appendix 5, Section 5.3.10.1 E. has been corrected in the Errata to read "...the 35-mi Fox River bike trail..."

1279.170

During the SSC final design phase, which will follow site selection, a surface runoff and erosion control plan will be developed, in consultation with local Soil and Water Conservation Districts. See EIS Volume

I, Chapter 6 for a statement regarding the DOE's position on complying with environmental regulations.

1279.171

All lands, even those with urban development, are habitats for wildlife. Therefore, in the ecological resource assessments, the use of the term "habitat" to indicate disturbed lands is justified.

1279.172

Table 3-8 is not a site comparative analysis. See EIS Volume I, Chapter 3, Table 3-7 for the analysis of comparative impacts by proposed sites. The acreage figure used in Table 3-8 represents an upper limit of potential impacts.

1279.173

Table 3-8 in Volume I, Chapter 3 of the EIS is a summary of the analysis in Volume I, Chapter 5, Section 5.6, and is similar to Table 5.6-1 in that Section.

The "comparison of natural resource requirements and availability among sites" is presented in Volume I, Chapter 5, Table 5.6-4, as are the savings calculated by using Fermilab as an injector facility.

1279.174

This information is consistent with that in EIS Volume I, Chapter 4, Table 4-1. See Comment Response 1279.94.

1279.175

Table 5.6-3 of EIS Volume I, Chapter 5 has been revised as suggested.

1279.176

It is acknowledged that only 3,708 acres of new fee simple land would be required if the Illinois site is selected. The figure presented in EIS Volume I, Chapter 5, Section 5.6.4 includes the 3,708 acres plus 6,800 acres of Fermilab that are already dedicated to Federal use.

See EIS Volume IV, Appendix 4, Section 4.4.3.1 for an explanation of the fee simple numbers.

See Comment Response 1279.298 regarding wetlands assessment.

1279.177

The quantities of natural and depletable resources shown in Volume IV, Appendix 5, Table 5.6-1, including tonnage of cement for cast-in-place concrete, are based on the generic SSC design from the Conceptual Design

Report. Calculating separate quantities to be included in Table 5.6-3 for each of the seven sites in the Best Qualified List was not necessary because the differences among the sites would be small enough not to distinguish between them. Therefore, quantities from Table 5.6-1 were adjusted for use at each site in Table 5.6-4 using the following approximations:

- For site and infrastructure, campus and injector facilities, quantities were increased or decreased in proportion to the ratio of the estimated cost of local material for the generic design to the estimated cost of local material for the site-specific design.

- Quantities associated with tunneling in the collider ring were adjusted as necessary to compensate for the method of tunneling used to satisfy the support required. Soft ground tunnels (Arizona), tunnels in slaking ground (Colorado, Texas), and tunnels in very wet ground (Michigan) use precast lining with an inside diameter of 10 ft.

  All other tunnels were in rock which started out as a tunnel 12 ft in diameter. Small portions of the rock tunnels, such as local shear zones, would require a 12-in thick, cast-in-place liner, which results in an inside diameter of 10 ft. All collider ring tunnels have a concrete floor. The quantities of cement required for 10-ft diameter tunnels in AZ, CO, and MI are less than the remaining sites, which are mostly 12 ft in diameter.

- Quantities associated with construction of experimental halls were adjusted, depending on the number of halls excavated by the cut-and-cover method and the number of halls constructed by underground rock cavern excavation.

1279.178

EIS Volume I, Chapter 3, Table 3-7 has been revised. The Soil Conservation Service identified 3,076 acres of prime farmland and 212 acres of important farmland in the SSC fee simple area on the U.S. Department of Agriculture Farmland Conversion Impact Rating Form AD-1006 submitted to the DOE. This is the information used to compare the farmland acreages at the seven sites. From these inventories, an estimated 197 acres of prime and important farmland in Illinois would be permanently converted by the SSC project. For more information see EIS Volume I, Chapter 3, Section 3.7.1.12; Volume I, Chapter 4, Section 4.8.6; Volume I, Chapter 5, Sections 5.1.7.2; and 5.2.11 and the Errata to Volume IV, Appendix 13.

1279.179

See Comment Responses 1279.178 and 1279.181. U.S. Soil Conservation Service acreage figures were used to provide a consistent database across all seven sites.

1279.180

The following definitions have been added to EIS Volume I, Chapter 4, Section 4.8.6:

Prime farmland is defined in 7 CFR 657.5 as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oil seed crops.

Unique farmland is defined in 7 CFR 657.5 as land other than prime farmland that is used for the production of specific high-value food and fiber crops.

Farmland of statewide importance is defined in 7 CFR 657.5 as land in addition to prime and unique farmlands that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops.

U.S. Soil Conservation Service figures were used to calculate prime and important farmland acreage in the revised Volume I of the EIS.

1279.181

The Illinois Soil Conservation Service acreages for prime and important farmland are used in the revised Volume I, Chapter 4, Section 4.8.6. These numbers were provided on the U.S. Department of Agriculture Farmland Conversion Impact Rating form AD-1006 submitted to the DOE in August 1988. The potential prime category has been removed from the revised Table 4-23.

1279.182

See Comment Response 1279.12 and 1279.178. U.S. Soil Conservation Service acreage figures were used to provide a consistent database across all seven sites.

1279.183

The value of 0.001 for the portion of Illinois farmland inventory removed by the proposed SSC project has been corrected to 0.0003 in EIS Volume I, Chapter 5, Table 5.2-1.

1279.184

See Comment Responses 1279.12, 1279.178, and 1279.181. U.S. Soil Conservation Service acreage figures were used to provide a consistent database across all seven sites.

1279.185

See Comment Responses 1279.12, 1279.178, and 1279.180. U.S. Soil Conservation Service acreage figures were used to provide a consistent database across all seven sites.

1279.186

For the sake of consistency in evaluating the seven proposed sites, the EIS considers Federal regulations. It is acknowledged that states may have laws and regulations which may also be applicable.

1279.187

In analyzing projected impacts from SSC construction and operation in each state, only those activities that would take place in each state were considered. Thus, in Illinois for example, no impacts associated with construction of the injector complex were included in the analysis of air quality (i.e., Illinois was given "credit" for Fermilab). Therefore, the consequences presented in the EIS acknowledge the existing facilities at Fermilab.

1279.188

EIS Volume IV, Appendix 7, Sections 7.1.3.3 and 7.2.3.3 have been revised to indicate that if Fermilab serves as the campus and injector complex, the water currently being used at Fermilab will, in part, become available to the SSC and will partially offset the requirement for new water for the SSC. Thus the incremental on-site water use for the SSC operations at the proposed Illinois site could be somewhat less than at the other sites. However, if the existing Fermilab system continues to operate as at present and perform physics experiments in parallel with the SSC, which is technically possible, there would be no reduction in operational water needs for the SSC. The actual reduction in the operational water needs listed in Table 7-1 of Volume IV, Appendix 7 to be credited to the Fermilab will be determined as part of the final SSC design if the Illinois site is selected.

1279.189

Waste quantities and disposal options discussed in the EIS (see Volume IV, Appendix 10) for the Illinois site are assumed to be independent of and in addition to any waste generation/disposal from the Fermilab facility, which is assumed to operate during SSC operations.

1279.190

The environmental consequences of constructing the SSC main ring and the additional support facilities and operating the SSC at Fermilab are not necessarily less than the environmental consequences of constructing and

operating the entire SSC complex (including a new injector) at a different site. EIS Volume I, Chapter 3, Section 3.5 presents a comparison of impacts among site alternatives.

Cost advantages are discussed in Comment Response 1276.01.

1279.191

Comment noted.

1279.192

The missing text has been restored to EIS Volume I, Chapter 2, Section 2.2.1., paragraph 2.

1279.193

This sentence has been reworded in the EIS to clarify its meaning.

1279.194

It would be inappropriate to add the suggested sentence because Chapter 3 of Volume I is the description of the proposed action. The fact that the injector facility already exists at the Illinois site is covered in the EIS. (See Volume IV, Appendix 1, Section 1.2.3.2 and Volume IV, Appendix 2, Section 2.4.2.2).

1279.195

Volume I, Chapter 3, Section 3.1.1.2.F has been revised. Volume I, Chapter 3, Section 3.1.1.2

1279.196

The referenced document (Geotechnical Summary To The Proposal To Site The Superconducting Super Collider in Illinois) states on p. 32:

"These alternative single campus geometries differ from the ring geometry given in the Invitation for Site Proposals and would require different real estate parcels. However, on the Illinois site, this is not considered to be a serious problem, and these geometries could be given consideration at a later date."

The geometry used in EIS analysis is the same as shown in ISP and as used by the Illinois site proposers as their site layout.

If Illinois is selected and final design includes a single campus, then the Supplemental EIS will address this issue.

1279.197

In EIS Volume I, Chapter 3, Figure 3-12, sites E2, E4, and E7 are shown correctly within the general accuracy of the drawing. It is recognized, however, that their position relative to other features that are discernible on the map can be improved by respective shifts of about 0.03 in. The comment does not appear to be valid with regard to sites F5 and F10, since these two sites are shown where proposed in Figures 3-1(a) and 3-1(b) of the Illinois proposal. The comment correctly assumes that site J3 was located according to the description in Table 6-5 of the Illinois proposal. As this description has been revealed as erroneous, J3 is shown approximately 2,000 ft from the actual proposed location. It should be noted that the same scenario applies to site J4. J4 was also located according to the description in Table 6-5 of the Illinois proposal, and that description can now also be assumed to be in error. In comparing it to Figure 3-1(a), it appears that this description should have stated "... shifted about 700 ft to the south...", not 700 ft to the north. Should the Illinois site be selected, the locations of all SSC facilities would be determined based on additional detailed design information and evaluated in the Supplemental EIS.

1279.198

EIS Volume I, Chapter 3, Figure 3-12 shows the Fermilab boundary as does Volume IV, Appendix 1, Figure 1.2.3-1. In addition, Volume IV, Appendix 1, Section 1.2.3 of the EIS describes the campus/injector/future expansion areas as being located entirely within the Fermilab boundaries.

1279.199

See Comment Response 1279.198.

1279.200

It is DOE intention to continue operations at Fermilab. The DOE does not anticipate any negative impacts on Fermilab or the Illinois Region of Influence if another site is selected for the SSC.

1279.201

EIS Volume I, Chapter 5, Section 5.1.2 has been corrected in response to the comment.

1279.202

The geometry used in the EIS analysis is the same as shown in the ISP and as used by the Illinois site proposers as their site layout.

The referenced document (Geotechnical Summary To The Proposal To Site The Superconducting Super Collider in Illinois) states on p. 32:

"These alternative single campus geometries differ from the ring geometry given in the Invitation for Site Proposals and would require different real estate parcels. However, on the Illinois site, this is not considered to be a serious problem, and these geometries could be given consideration at a later date."

1279.203

DOE agrees that Fermilab has had a comprehensive monitoring program. There are several factors that need to be considered regarding operation of the SSC at the Illinois site. They are:

(1) The radiological impacts of operating Fermilab in the fixed target mode plus the operation of the booster system to support SSC would vary depending upon the number of fixed target physics experiments conducted. However, the effects would be additive.

(2) The radiological impacts of coupling the Fermilab booster with the SSC but not operating in the fixed target mode would still have a higher radiological impact than siting an entirely new SSC because of the buildup of long-lived radionuclides due to activation of the existing Fermilab facility.

(3) Siting a totally separate SSC facility in Illinois would also have a net additive effect on radiological impacts provided there continues to be a demand for fixed target irradiation experiments at Fermilab.

1279.204

The last paragraph of EIS Volume I, Chapter 3, Section 3.6.1 has been corrected to conform with the ISP.

1279.205

The background concentrations of radium-226 in groundwater in the region of the proposed Illinois site ranged from 0.5 to 15.2 pCi/l with an average of 7.3 pCi/l (EIS Volume I, Chapter 4, Table 4-13). It is above the U.S. EPA Maximum Contaminant Level (MCL) for radium. Although groundwater samples do not indicate an overall problem for this region, the groundwater with high radium level may be used as cooling water or for other purposes other than potable water. Volume I, Chapter 4, Table 4-3 has been revised to read: "elevated radium in groundwater in area just east of site."

Studies conducted in Illinois indicate that the potable groundwater supplied by the Cambrian-Ordivician Aquifer System to a large portion of the northern part of the state, exceeds the U.S. EPA MCL of 5 pCi/liter for total radium.

1279.206

EIS Volume I, Chapter 4, Section 4.6.1 has been revised to indicate the average annual radiation dose to an individual from radon and its decay products, radionuclides deposited in human tissues, terrestrial radionuclides, and cosmic radiation. A detailed discussion about the exposure of the population in the U.S. and Canada to natural background radiation can be found in Volume IV, Appendix 12, Table 12.2.1-1.

The main sources of naturally occurring background radiation are contributions from radon and its decay products (200 mrem/yr), radionuclides in human tissues (40 mrem/yr), terrestrial radionuclides (28 mrem/yr), and cosmic radiation (27 mrem/yr).

1279.207

EIS Volume I, Chapter 4, Section 4.6.1 has been revised to indicate that the average annual radiation dose to an individual from external radiation (terrestrial and cosmic rays) and internal radiation source is about 100 mrem; the dose from radon may be as much as 200 mrem/yr.

1279.208

The gross alpha measurements (ranged from 0 to 3.4 pCi/l with an average of 1.3 pCi/l) and the gross beta measurements (ranged from 3.5 to 6.2 pCi/l with an average of 5.3 pCi/l) have been added to the Table 4-12. A footnote has also been added to indicate these data were based on analyses of Fox River water at Elgin in 1976 State of Illinois.

1279.209

EIS Volume I, Chapter 4, Section 4.6.1.1.D has been revised to indicate that sandstones with high radium-226 concentrations are not expected to be encountered at the proposed tunnel depth in Illinois.

1279.210

The referred to sentence has been revised to indicate that the low-level radioactive waste annual output is estimated to be 8,000 ft^3 (220 m^3) containing 10 Ci.

1279.211

The line in question has been revised and reads: NA-22 2.4×10^9 pCi.

1279.212

The sentence in question has been revised and indicates that, "Each shipment....., and would contain 0.75 to 1.26 Ci (total of 10 Ci/yr) of...."

1279.213

Errata for EIS Volume IV, Appendix 5, Section 5.3.6.2 is revised to indicate that the referenced nuclear facilities release radioactive materials to the atmosphere during normal operation, the short half-lives of those materials and the distance from the proposed SSC site -- at least 25 miles -- preclude any significant contribution to background radiation at the proposed Illinois site.

1279.214

The caption for Figure 10.1.2-4 in the EIS (Volume IV, Appendix 10) has been revised in the Errata. The revised caption indicates that the doses are estimated for a 6 m (20 ft) distance from the beam in the tunnel and that the doses take into account attenuation only from heavy soil.

1279.215

EIS Volume IV, Appendix 10, Section 10.1.2.3.A.1.b has been revised to read: "This TV distance varies from 3,130 ft (0.95 km) to..."

1279.216

Some of the energy absorption in the radiation cascade will take place in the air of the interaction region (IR) halls, as well as in the air of the accelerator tunnel (see radioactivation references, EIS Volume I, Chapter 9). A fraction of the energy absorbed by the air results in activation of the air nuclei. Ionization and excitation of molecules of the air in the tunnel will induce chemical reactions which may result in ozone and various oxides of nitrogen. However, the production of these materials will be very low (less than one million times smaller than any applicable regulation or standard).

1279.217

Radioactivation of soil/rock and subsequent leaching and migration are dependent upon site parameters. Because all these parameters were not available during the preparation of the EIS, a conservative approach based on the Borak studies was used. The production of sodium-22 is dependent upon the aluminum content of the soil/rock. Soils/clay typically have a range of 10-20 percent aluminum oxide, while dolomite normally contains only trace amounts. The leaching and reabsorption of radionuclides are dependent on several factors, the most important one being surface area. The surface area exposed by fractures in rock is expected to be less than that present in glacial till. At the selected site, testing would be necessary to characterize activation, leachability, and transport characteristics of tunnel rock. For an additional discussion, see EIS Volume IV, Appendix 12, Section 12.2.3.1.C.

1279.218

Volume IV, Appendix 10, Table 10.1.3-16 has been changed to indicate that the disposal site in Illinois is not yet located. Also, the estimated total distance to the regional compact site for Illinois in Table 10.1.3-18 has been footnoted to indicate that the information is based on potential location in Clark County.

The projected annual volume of 8,000 ft^3 and 10 Ci of SSC low-level radioactive waste is a small percentage of the waste generated in the State of Illinois. Based on 1986 data, SSC waste would represent 4 percent of the volume of 227,084 ft^3 and 0.02 percent of the activity of waste shipped from the State of Illinois to a commercial low-level waste facility. The total waste generated by Fermilab and the SSC would depend upon operational changes that may occur at Fermilab (see Comment Response 0276.03).

1279.219

This correction has been made in the Errata to EIS Volume IV, Appendix 12.

1279.220

The fifth sentence of Paragraph 2 (EIS Appendix 12, Volume IV) has been corrected and reads as "This is to be compared to the current EPA standards of 0.5 pCi/ml for Na-22 and 20 pCi/ml for H-3."

1279.221

To maximize safety considerations, the model discussed in EIS Volume IV, Appendix 12 is intentionally conservative and tends to overestimate the concentration of radionuclides in groundwater due to any beam loss.

1279.222

The collective dose equivalent to the general public was treated as additive. The estimated population dose from air activation products, radon/radon progeny, and total dose equivalent via the air pathway reported in Volume I, Chapter 5 represents the total person-rem from ten service facilities plus four interaction halls. The accompanying table has been footnoted to clarify that the person-rem reported is a total and not the collective dose equivalent from one facility. Because of the distances between individual release points, the dose equivalent to the maximally exposed individual was not treated as additive. In addition to the aforementioned conservatism, we assumed all of the beam loss would occur at a given location. For beams interacting with residual gas, a beam-gas lifetime of 300 hours was assumed. This corresponds to a loss rate of 7×10^8 per second (each ring). Because in the accident scenario the beam loss usually occurred at one given location and would be detected at once, the additive method will over-estimate the collective population exposure.

Detailed population data for the 16 sectors surrounding the 14 release points was not available. Therefore for conservatism, default values for a suburban population were used for the proposed Illinois site (Volume IV, Appendix 12, Section 12.2.3.1.B) in the Clean Air Act Codes (CAAC). Average beam line depths were used (Volume IV, Appendix 10, Table 10.1.2-5) for determining hold-up times. After a site is selected and service facility and interaction hall release points are sited, the populations of each affected sector as well as beam line depth would be determined. The population distributions, site-specific meteorological data, and radon emanation at tunnel depth would be used in determining the dose from airborn releases.

1279.223

The unit of exposure for the "selected individual" used in EIS Volume IV, Appendix 12, Table 12.3.1-32 and Table 12.3.1-33 has been corrected from "ML" to "WL." "WL" is the abbreviation for "working level." One working level is defined as exposure to an atmosphere that contains any combination (of concentration) of radon daughters so that the total alpha particle emission in one liter of air is 1.3×10^5 MeV in the complete decay through ^{214}Po.

1279.224

The reference to Table 12.2.1.2 has been deleted in the Errata and Revisions to Volume IV, Appendix 12.

1279.225

As a measure of health impact from the intake and/or exposure to radionuclides, the total fatal cancer rate (deaths/year) in the exposed population is the mortality rates from all radionuclides from all exposure pathways and/or all intake modes for all types of cancer during the mean individual lifetime (70.7 years) in a population of 100,000 exposed individuals.

As another measure of the impact of the intake or exposure to the radionuclides, RADRISK, a computer prediction model, estimates the years of life lost due to exposure to or intake rate of the radionuclides. The total years of life lost has units of years per 100,000 persons per exposure rate (Ci/yr). This exposure is the summation of external exposures, inhaled or ingested, and external exposures. These values are simply the difference between the years of life lived by the 100,000 people with and without the incremental risk from radiation exposure. The values presented in the tables in EIS Volume IV, Appendix 12 have been converted to the average years of life lost per person.

EIS Volume IV, Appendix 12, Tables 12.3.1-34 and 12.3.1-35 have been corrected to reflect that the units for fatal cancer risks from all exposures is deaths/year and the units for life lost from all exposures is in years lost (year) not deaths/year.

1279.226

The equivalent depth for the Illinois proposed site has been corrected from 8.8 to 88 (see EIS Volume IV, Appendix 12, Table 12.4.1-2).

1279.227

The analysis for public service impacts used most-recently available employment and population data, from a Federal survey of local government sources and state education agencies, to formulate projections which maintained current service ratios between employment and population (see EIS Volume IV, Appendix 14, Sections 14.1.2.3 and 14.1.3.3.C). This methodology facilitates the comparison of impacts between sites, and utilizes data consistent among the sites. Due to the large number of local government jurisdictions studied in the EIS, it was not feasible to analyze the existing capacities and qualities of services for each local jurisdiction. A finer level of analysis, incorporating such local statistics and measurements, would be included in the Supplemental EIS.

1279.228

In the EIS, SSC population impacts for Illinois are allocated in the same proportions as the existing residence distribution of Fermilab employees (Appendix 14, Section 14.1.2.3.B.2.b). The data clearly show that proximity to work is an important factor to Fermilab employees, and probably would be important to SSC workers as well.

1279.229

The rate of unemployment in the Illinois Region of Influence has decreased significantly, while simultaneously, the labor force has increased.

1279.230

Besides the offsets discussed in the comment, expected indirect SSC-related gains in tax revenue would result in positive net fiscal impacts to Kane County jurisdictions, beginning in the fourth year of SSC construction, and continuing throughout the remaining life of the project (see EIS Volume IV, Appendix 14, Section 14.1.3.3.D).

1279.231

In addition to the offsets discussed in the comment, expected indirect SSC-related gains in tax revenue would result in positive net fiscal impacts to DuPage County jurisdictions, beginning in the fourth year of SSC construction, and continuing throughout the remaining life of the project (see EIS Volume IV, Appendix 14, Section 14.1.3.3.D).

1279.232

See Comment Response 41.02, 41.04, 41.05 and 41.06.

1279.233

The sentence referred to in the comment was in error and should be deleted.

1279.234

As stated in EIS Volume IV, Appendix 4, the State is responsible for acquiring lands for the SSC. "Land acquisition will include, as necessary, the land and its improvements, mineral rights, water rights, and any other subsurface rights, air rights, easements, restrictions, licences, permits, and agreements. Prior rights will be identified and acquired, as necessary."

While State laws and policies may vary among the various site alternatives (see Volume IV, Appendix 4), it may be generally assumed that water rights will be retained by holders or lessees of land for which the DOE has acquired stratified fee estate. Present surface uses of this land, therefore, should be unaffected.

1279.235

While the SSC is an underground structure, it has surface project areas which may encroach floodplains. For the Illinois site, F5, K4, J3, and J6 potentially encroach 100-year floodplains. Details on floodplain encroachment are in Volume IV, Appendix 7, Section 7.1.3.3 and Volume I, Chapter 5, Section 5.1.2.2.

Potential impacts to rivers and streams (drainage network) are discussed in Volume IV, Appendix 7, Section 7.1.3.3.B.

1279.236

See Comment Response 1279.234.

1279.237

See Comment Responses 1068.51 and 1279.234.

1279.238

EIS Volume I, Chapter 4, Table 4-4 has been extensively revised by incorporation of additional water use data. Reference to the Pierre Shale was a typographical error.

1279.239

Prior to site construction, the DOE will prepare a Site Implementation and Monitoring Plan. During preparation of this plan, which will coincide with final site design, consultation will be done with all appropriate regulatory agencies and groups, or agencies with extensive site technical data or expertise.

1279.240

Comment noted.

1279.241

F5, K4, and J3 are located so close to the 100-year floodplains that, considering the intrinsic error associated with floodplain mapping, they were also listed as potential encroachments. J6 encroaches on the 100-year floodplain, as the floodplain map indicates. (See Figures in Volume I, Chapter 5, Section 5.1.2 or EIS Volume IV, Appendix 7, Section 7.2.3.3.) If Illinois is the selected site, more detailed studies and floodplain surveys would be necessary to fully assess floodplain encroachment.

1279.242

The DuPage River joins with the Des Plaines River southwest of Joliet, and continues in an overall westerly direction towards the confluence with the Kankakee River (see EIS Volume IV, Appendix 5, Figure 5.3.2-2). The text of Volume IV, Appendix 5, Section 5.3.2.1.a should read, "The DuPage River continues to flow south toward its union with the Des Plaines River southwest of Joliet. Continuing in an overall westerly direction, the Des Plaines joins with the Kankakee River to form the Illinois River."

1279.243

Figure 5.3.2-2 of Volume IV, Appendix 5 has been corrected in the Errata in response to the comment.

1279.244

The text of the EIS has been revised according to the comment. See EIS Volume IV, Appendix 5, Section 5.3.2.1.B, Errata.

1279.245

The text has been revised in the Errata to Appendix 5 in response to the comment.

1279.246

By definition, a tributary may be any stream which contributes water to another stream. The West Branch of the DuPage River, therefore, would

qualify as a tributary to the Illinois River. No correction of the referred sentence in EIS Volume IV, Appendix 5 is necessary.

1279.247

The study of floodplain encroachment in EIS Volume IV, Appendix 7, Section 7.1.3.3 and Volume I, Chapter 5, Section 5.1.2.2 is based on project locations proposed by the State. As stated in EIS Volume IV, Appendix 7, Section 7.1.2.2.C "...the process of assessing impacts involved identifying the potential location of a facility in or near a 100-yr floodplain according to the FEMA rate maps..." Reviewing the maps attached to the comment, the suggested project locations are very close to the 100-yr floodplains and may be potential encroachments when considering the possible errors in floodplain mapping. At the selected site, project location adjustment and detailed assessment of flood hazards will be conducted based on the latest available data.

1279.248

The comment on the increase in flood height is noted. The EIS addresses all potential encroachments of the 100-year floodplain without specific consideration of any increases in flood height which may be allowed in different areas. Detailed study on flood hazards will be conducted for the selected site and addressed in the Supplemental EIS.

EIS Volume I, Chapter 5, Section 5.1.2.2 states that J6 is one of the potential encroachments and that encroachments may be avoided through adjustments of the final facility locations. If relocation is not possible, levees could also be used to mitigate. Detailed mitigation planning will be conducted for the selected site.

1279.249

See Comment Response 1279.170.

1279.250

See Comment Response 1279.234.

1279.251

The spelling of the prairie bush clover has been corrected in the EIS.

1279.252

This comment is consistent with information on the distribution of prairie bush clover and the Indiana bat as described in EIS Volume I, Chapter 5, Section 5.1.5 and Volume IV, Appendix 11, Section 11.3.3.2.

1279.253

The term "prairie brush clover" has been changed to "prairie bush clover."

125113003358877

1279.254

The comment stated that although there appears to be inadequate habitat for the Indiana bat, there is the remote possibility that the species may forage in the area. The DOE has conducted reconnaissance surveys of potential habitat, and there may be such areas in the vicinity of the proposed Illinois site. This has been reported in the revised EIS Volume I, Chapter 5, Section 5.1.5.2.C, and Volume IV, Appendix 11. The potential presence of the prairie bush clover has also been addressed in these sections of the EIS; the information provided is consistent with statements made by the comment. In the event the Illinois site is selected, additional surveys to confirm the presence of these and other protected species would be conducted and will be included in the Supplemental EIS.

1279.255

The information used to generate Table 4-17 of EIS Volume I, Chapter 4, was provided by regional and field offices of the U.S. Fish and Wildlife Service (USFWS) in response to written inquiries by the DOE on the presence of listed species at each of the proposed sites. The species lists provided by the USFWS (see Attachment A to EIS Volume IV, Appendix 11) were based on the proposed location of each SSC site and on the USFWS' knowledge of species presence and local habitat availability. Each regional office would have consulted the Endangered Species Information System (ESIS), which is a county-wide data base, as well as other data available to them, to provide a response to DOE's request.

In preparation of the EIS, the DOE confirmed the USFWS lists by reviewing data provided by the states and the literature, including the ESIS. Additional species beyond those listed in Table 4-17, including those listed by the commenter, were addressed in the text of the DEIS as appropriate if the potential presence of preferred habitat or other information on the species indicated that the species could be present. The DEIS also accounted for a degree of uncertainty because of the lack of detailed field surveys needed to confirm the presence of listed species. In a few cases, additional information became available after preparation of the DEIS, and was used in preparation of the EIS. Site-specific and species-specific habitat surveys were conducted at each of the proposed sites and, along with information provided by commenters on the DEIS, resulted in revision of the data base on threatened and endangered species reported in EIS Volume IV, Appendix 11 of the EIS.

Additional surveys for the presence or absence of protected species would be conducted at the selected site, and resultant information would be reported in the Supplemental EIS.

1279.256

All references to the Indiana bat requiring trees with 16 in d.b.h. have been deleted from the EIS. Habitat surveys for the Indiana bat identified potential summer habitat occurring at the proposed J2 site and in

eight other nonriparian areas. This is reported in Volume IV, Appendix 11, Section 11.3.3.2 of the EIS. Although the EIS indicated that it is unlikely that the Indiana bat actually occurs on the site, potential habitat would be surveyed in the event the proposed Illinois site is selected. Other areas near the site would also be investigated as plans for ancillary facilities such as access roads and power lines not identified in current project plans are established after site selection. The results of this investigation would be reported in a site-specific Supplemental EIS. If the Indiana bat is found to have a high probability of occurring on the site, the DOE would begin consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act.

1279.257

See Comment Response 1279.254.

1279.258

Information provided by the commenter on the status of the lakeside daisy has been incorporated in EIS Volume IV, Appendix 11. Table 4-17 in Volume I, Chapter 4 is a listing of federally protected species. The lakeside is still listed as a candidate species. The species has been added to Volume I, Chapter 4, Table 4-18, state-listed species, and has been designated as threatened in Illinois.

1279.259

The word "forest" has been added in the Errata to the Indiana bat entry of Federally-listed endangered species in Illinois in EIS Volume IV, Appendix 5.

1279.260

The EIS evaluates the available transportation services based on both the existing facilities and the proposed improvements (EIS Volume IV, Appendix 14, Section 14.2.1.3.C.1). The statement that there are few transportation and infrastructure upgrades proposed (EIS Volume 1, Chapter 3, Section 3.4.3) simply summarizes the proposed upgrades and does not suggest deficiency. Illinois already has an extensive transportation system in the general area of the proposed site.

1279.261

The EIS road construction scenario for the Illinois site includes a total length of about 1 mi of new one-lane roads. This mileage is comprised of relatively short sections of paved access roads to sites E1, E2, E3, E5, E6, E7, and E10, as described in EIS Volume IV, Appendix 1, Section 1.2.3.8.E. Contrary to the statement made in this comment, the Illinois Site Proposal, Volume 4, does not appear to state that all "...access roads to be constructed will be designed as 2-lane paved roads." The EIS road construction scenario will remain as is.

1279.262

Information on the availability of a ridesharing program in the Fermilab vicinity has been incorporated into the EIS through a revision to Volume I, Chapter 4, Section 4.9.2.1 and Errata to Volume IV, Appendix 5, Section 5.3.11.2.A.5.d.

1279.263

Waterway access to the Mississippi River system and Gulf Coast is mentioned in EIS Volume IV, Appendix 5, Section 5.3.11.2.

1279.264

See Comment Response 1279.261.

1279.265

The traffic data present average traffic volume (see EIS Volume IV, Appendix 14, Tables 14.2.1-5 and 14.2.1-6) during a peak hour. Traffic at any point on the road could be higher or lower. The low level of service (LOS E and F) on Routes 64 and 34 may be due to localized congestion.

The analysis of traffic presented in the EIS is based on the projection of non-SSC traffic on existing roads, proposed improvements, and the direct impact of SSC traffic. This is consistent with the intent of the EIS to identify the more serious potential impacts. Only the road improvements included in the State proposal for the SSC site and currently committed State road improvements could be credited for helping to reduce the impacts of the SSC on the area's traffic. The improvements proposed by the State are discussed in Volume I, Chapter 5, Tables 5.1.8-9 and 5.1.8-10 and Volume IV, Appendix 5, Section 5.3.11.3. It is possible that the actual traffic conditions will be different than the projected conditions due to additional improvements done when needed.

1279.266

See Comment Response 1201.04. This observation is consistent with that in EIS Volume I, Chapter 5.

1279.267

See Comment Response 1279.265.

1279.268

See Comment Response 1201.04.

1279.269

The EIS mentions two possibilities for rail construction in Illinois: a 0.8 mi-long siding 0.6 mi east of Big Rock or, if necessary, a 4.8 mi-long stub-end spur between Big Rock and Kaneville. Both possibilities would be constructed mostly parallel to existing rail or highway construction. Existing drainage patterns would be changed very little if the distance between existing and new parallel construction is kept to a minimum. Drainage and erosion details will be taken care of during final design. All work will be conducted in an environmentally safe and sound manner in compliance with applicable environmental statutes, regulations, and standards.

1279.270

See Comment Responses 13.02 and 1279.265.

1279.271

See Comment Response 1201.04.

1279.272

See Comment Response 1279.262.

1279.273

Noise impacts produced by spoils hauling activities are a function of the size of the haul vehicle, the average round trip to the disposal site, the amount of spoils hauled, and the proximity of haul routes to disposal sites. Stockpiling spoils at a site will not, for a given haul truck size, reduce the number of trips ultimately needed to dispose of the spoils produced by the tunnel boring machines and by shaft excavation. Potential spoils impacts may be reduced by reducing the average round trip distance to the disposal site. Increasing the number of sites available for spoils disposal does create the potential to reduce impacts if this avoids having several spoils-generating locations from feeding a common haul route. Mitigations that have the potential to reduce noise impacts from spoils hauling are discussed in EIS Volume IV, Appendix 9.

1279.274

The required new access roads to intermediate access areas E1, E2, E3, E5, E6, E7, and E10 are assumed to be paved one-lane roads for purposes of this EIS, as described in Volume IV, Appendix 1, Section 1.2.3.8.E. Volume IV, Appendix 14, Section 14.2.1.3.C.1.a.2 has been corrected in the Errata accordingly.

1279.275

The required new access roads to intermediate access areas E1, E2, E3, E5, E6, E7, and E10 are assumed to be paved one-lane roads for purposes of this EIS, exactly as described in EIS Volume IV, Appendix 1, Section 1.2.3.8.E. Figure 1.2.3-3 in Appendix 1 and Figure 14.2.1-4 in Appendix 14 have been revised. With regard to the comment that "All roads will be a minimum of 2-lane...," see Comment Response 1279.261.

1279.276

The road construction scenario for the Illinois site as used for the EIS is described in Volume IV, Appendix 1, Section 1.2.3.8. This scenario differs slightly from the data provided in Table 4-3 of the original Illinois proposal because it uses a total of 3.5 mi of new access roads vs. the 5.5 mi shown in the Illinois Table 4-3. The 3.5-mi figure is based on the information shown on two maps submitted to the DOE by the State of Illinois in March 1988. These two maps are designated Exhibit 1.6.4-4a and Exhibit 1.6.4-4b. In contrast to the more detailed data shown in Volume IV, Appendix 1, road improvement mileages shown in various tabulations in Volume I have generally been rounded to the nearest mile. Also in those tabulations, the 4-mi Butterfield Road widening project is listed in the "miles of new road", or "miles of 4-lane highway" categories, rather than creating a special category for this item. With regard to the use of one-lane access roads for the E sites, see Comment Response 1279.261. The EIS Volume IV, Appendix 14 paragraph referred to in the comment has been revised to conform with the correct data, as shown in Volume IV, Appendix 1, Section 1.2.3.8.

1279.277

See Comment Response 1279.265.

1279.278

Your comment, "Three of the upgraded facility access roads would cross existing rail lines," agrees with the statement in Volume IV, Appendix 14, Section 14.2.1.3.C.2. Your comment that the proposed roads from the E and F points to the existing road system do not cross rail lines is noted.

1279.279

Rail facilities and any improvements included in the State of Illinois proposal are discussed in Volume IV, Appendix 5, Section 5.3.11.2 and in Volume IV, Appendix 14, Section 14.2.1.3 C.

1279.280

See Comment Response 1201.04.

1279.281

Bus service provided by PACE is discussed in Volume IV, Appendix 5, Section 5.3.11.2.A.5. The use of bus service to mitigate traffic impacts is addressed in EIS Volume IV, Appendix 14, Section 14.2.1.3.C.1.b and Volume I, Chapter 3, Section 3.6.

1279.282

Comment noted.

1279.283

EIS Volume IV, Appendix 5, Section 5.3.11.2.B.1.b has been corrected in the Errata.

1279.284

The DOE has verified that the suggested change is correct. Therefore, EIS Volume IV, Appendix 5, Section 5.3.11.2.B.1.e has been corrected in the Errata to clarify the status of Braidwood Unit 2.

1279.285

EIS Volume I, Chapter 4, Section 4.9.2.2 has been revised, as requested.

Braidwood Unit 2 was put on line as verified in the "Regional Reliability Council Coordinated Bulk Power Supply Program", published on April 1, 1988, by the Mid-America Interconnected Network. Since the time reference of the paragraph is 1987, Braidwood Unit 2 was considered as additional capacity.

1279.286

EIS Volume I, Chapter 4, Table 4-30 has been revised accordingly. See also Comment Response 1279.285.

1279.287

The statement by Commonwealth Edison Company that no new right-of-way is required for the new electric transmission line at the far cluster is accepted. EIS Volume I, Chapter 3, Table 3-4 and Volume IV, Appendix 4, Table 4-3 and Section 4.4.3.5 have been revised accordingly.

1279.288

Comment paragraph 1: the paragraph referred to in the comment from EIS Volume IV, Appendix 14, Section 14.2.2.C.1.a.3, was based on the North American Electric Reliability Council (NERC) report "1987 Electric Supply and Demand" published in November, 1987. While data for individual companies was available at the time of writing, NERC had not yet

published national values. To provide a comparison for all NERC regions, 1987 data were used.

Comment paragraph 2: the values identified by the comment cannot be verified at this time. They do not agree with NERC's 1988 Electricity Supply and Demand values, published in October 1988, or with values published in 1987.

Comment paragraph 3: updating the referenced paragraph to change the capacity margin from 18 percent to 17 percent is dependent on the revised values, which have not been verified. No revision was made to the EIS based on this comment paragraph.

Volume IV, Appendix 14, Section 14.2.2.3.C.1.a.3 has been corrected in the Errata to clarify the status of Braidwood Unit 2. Also see Comment Response 1279.284.

1279.289

EIS Volume IV, Appendix 14, Section 14.2.2.3.C.1.a has been corrected in the Errata to indicate that four new nuclear units, Byron Unit 2, Braidwood Units 1 and 2, and Clinton, with a total capacity of 4,310 MW, were placed in commercial operation and joined the MAIN network by 1988.

1279.290

EIS Volume IV, Appendix 14, Section 14.2.2.3 has been corrected in the Errata to clarify the status of Braidwood Unit 2. Also Response Comment 1279.284.

1279.291

The statements made in the comment are consistent with the EIS. See EIS Volume IV, Appendix 14, Section 14.2.2.3 C.1.a.

The paragraph in EIS Volume IV, Appendix 14, Section 14.2.2.3 C.1.c has been deleted in the Errata to Appendix 14. The paragraph incorrectly infers that the SSC load would replace the Fermilab load. Fermilab will be used as the injector for the SSC approximately one hour per day. During the remaining hours, Fermilab would be available for other research. This is possible at the Illinois site because the existing experimental halls in use at Fermilab would remain and at all other sites the injector facilities would be constructed without experimental halls. Thus, the Fermilab and SSC loads would be additive. The total load would be the current Fermilab load plus the "non-injector" SSC load.

1279.292

Comment noted.

1279.293

Comment noted.

1279.294

Comment noted. These data are consistent with that discussed in EIS Volume I, Chapter 5, Section 5.1.8.

1279.295

The information in EIS Volume IV, Appendix 5, Table 5.3.8-1 was provided by Mr. T. G. McSwiggin, Manager, Permit Section, Division of Water Pollution Control, Illinois EPA, Springfield, Illinois on June 6, 1988. The SSC project is not likely to have any effect on the West South West Water Reclamation Plant.

1279.296

These cooling tower blowdown water treatment methods and details are planned to be included in the Supplemental EIS after the site is selected. The details are planned to be worked out during the detail design phase for the selected site.

1279.297

The comment is noted that the solid waste capacity information developed in the EIS is accurate and defendable; recycling of some of the solid waste appears to be feasible.

1279.298

The wetlands assessment presented in the EIS has been revised to include a reevaluation of wetland location, type, and quality (see EIS Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.3.3). Wetland locations and type were determined from the U.S. Fish and Wildlife Service National Wetland Inventory maps available for the area. Wetland quality evaluations were based on field surveys conducted at the site. Wetlands were assessed for all areas where surface construction could occur either immediately or for potential future expansion (areas A, B, C, E, F, J, and K). The locations of these areas were determined from the original state proposals as modified by supplemental information submitted by the states on March 15 and 31, 1988. If Illinois is selected as the SSC site, modifications to the location of facilities could be made during final site design and would be evaluated in the Supplemental EIS. Following site selection, mitigation plans would be developed in and permits will be obtained from the U.S. Army Corps of Engineers.

1279.299

Volume I, Chapter 1, Table 1-1 has been revised to include the results of a reevaluation of wetlands impacts. See Comment Response 1292.05.

125113003358885

1279.300

The word "Potential" has been added to the title of Table 3-7 in EIS Volume I, Chapter 3.

1279.301

Among the site alternative, Michigan is the only State that has been delegated permitting authority under Section 404 of the Clean Water Act. However, the DOE would also consult with other state agencies as appropriate.

1279.302

The wetlands assessment presented in the EIS has been revised to include a reevaluation of wetlands location, type, and quality (see EIS Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix II, Section II.3.3.3). A conservative estimate of the amount of wetlands that may be impacted by construction of the proposed collider facilities at the SSC in Illinois is now placed at approximately 199 acres. If future expansion areas are developed, the potential exists for about another 294 acres of wetlands impacts. It is the DOE policy to avoid wetlands impacts where practicable; also the DOE is regulated by requirements of Section 404 of the Clean Water Act and Executive Order 11990 Protection of Wetlands. Detailed plans to mitigate to the extent practicable any anticipated wetland impacts at the selected site would be developed in consultation with the U.S. Army Corps of Engineers (or delegated State authority) and analyzed in detail in the Supplemental EIS. Mitigation is discussed in general in the EIS sections mentioned above. Volume I, Chapter 5, Section 5.1.5.3 explains the difference in wetland acreages reported between the DEIS and the EIS. The difference between the wetland acreage in the EIS and those in Technical Comment WET 001 is largely due to the inclusion of wetlands within Fermilab in the EIS totals. Not having precise locations for various construction areas within Fermilab for Areas A, B, and C, conservative estimates had to be used that these areas would be within wetland areas (see EIS Volume IV, Appendix II, Section II.2.2).

1279.303

See Comment Responses 1279.36, 1279.37, 1279.38, and 1279.314.

1279.304

The text of the EIS has been revised. EIS Volume I, Chapter 5, Section 5.1.2 states that the State of Illinois proposes the placement of slurry-trench cutoff walls around the perimeter of each shaft prior to excavation to minimize shallow groundwater inflow and effects on streams and wetlands.

1279.305

Impacts to those wetlands that lie within the proposed locations of areas A, B, and C and E, F, J, and K areas have been evaluated in the EIS. Some of these wetlands could be directly affected by construction. The EIS has been revised to incorporate information on the location of facilities, wetland encroachment, and wetland mitigation (see Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.3.3).

1279.306

The wetlands assessment has been revised to consider those wetlands that are adjacent (within 250 ft) to all areas where surface construction would occur (see Volume I, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.3.3).

1279.307

Existing buildings are not shown on any of the wetland maps to avoid obscuring the wetland boundaries on the small scale necessary in the 8 x 11 format. The text has been revised to eliminate the suggestion that these have been shown. Most existing Fermilab buildings are located primarily within the northwest portion of the property, immediately adjacent to the cooling canal for the ring (see Volume IV, Appendix 11, Figure 11-2).

1279.308

Figure 11-8 (in Appendix 11, Section 11.3.3.3) has been revised to depict those wetlands, as shown on the U.S. Fish and Wildlife Service National Wetland Inventory map, that exist within the proposed J6 area. The referenced 2-acre wetland is outside of the boundary of the J6 area, based on the location of J6 as indicated in the original proposal or supplemental data of March 15 and 31, 1988. If the State has modified the planned location of J6 (e.g., considered a realignment) and Illinois is the selected site, this modification would be analyzed in the site specific supplement to the EIS.

1279.309

See Comment Responses 1279.307 and 1279.19.

1279.310

This section has been revised to include a reevaluation of wetlands. See Comment Response 1279.298.

1279.311

EIS Volume I, Chapters 1 and 5 have been revised to include a reevaluation of wetlands. See Comment Response 1279.298.

1279.312

The referenced page number and table do not concern wetlands. It is assumed the comment was addressed towards Table 5.6-4. This table has been revised to reflect the revised wetland impact assessment. Also, see Comment Responses 1279.298 and 1279.306.

1279.313

The terminology used in EIS Volume IV, Appendix 5, Section 5.3.9.2 is descriptive of the vegetative characteristics of the wetlands found in this area. The USFWS National Wetland Inventory Maps have been used in a reassessment of wetlands impacts for the EIS (Volume I, Chapter 5 and Appendix 11). USFWS nomenclature is used consistently in keeping with the national scope of this EIS.

1279.314

The text has been revised in accordance with the comments. See Errata to Volume IV, Appendix 5, Section 5.3.9.2.

1279.315

"Agricultural/wetlands transition" has been added to the list of transition zones in Illinois. EIS Volume IV, Appendix 5, Section 5.3.9.6.C has been corrected in the Errata.

1279.316

The assessment of wetland impacts has been revised to include information on the quality of wetlands in only those areas that would have surface disturbance (areas A, B, C, E, F, J, and K). The re-assessment of wetland quality was based on field surveys conducted at each of the proposed SSC sites that contained wetland habitat. The location and extent of wetlands at each of the sites was based previously on total fee simple areas compared to the U.S. Fish and Wildlife Service National Wetland Inventory Maps. See revised Volume I, Chapter 5, Section 5.1.5.3 and

1279.317

See Comment Response 1276.01.

The acreages that would be temporarily and permanently disturbed because of the construction and operations of the SSC have been reestimated for the seven site alternatives. An expanded version of Table 3-2 (EIS Volume I, Chapter 3) shows the results of this latest estimate. The various EIS analyses that involve the estimated acreages of disturbed lands were updated accordingly, and the results are now reflected in the EIS.

1279.318

The wetland assessment has been revised to incorporate the current information on wetland location, type, and quality (see Volume IV, Appendix 11, Section 11.3.3.3). Wetland location and type was derived from U.S. Fish and Wildlife Service National Wetland Inventory maps. Wetland quality was determined during field surveys at each of the sites where surface construction would occur (A, B, C, E, F, J, K). It is noted in Volume IV, Appendix 7, Section 7.2.3.3 that use of dewatering for SSC construction will be minimized to reduce water level and potential siltation impacts to wetlands. More detailed assessments of impacts to wetlands from SSC construction at the selected site are planned for the Supplemental EIS.

1279.319

Groundwater seepage rates during tunnel construction are expected to be low (See Volume IV, Appendix 10, Section 10.2.3.3). As a consequence, wetlands are not expected to experience drawdown during tunnel construction. The EIS has been revised to state this (see Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.3.3). Also, see Comment Response 1292.05.

1279.320

See Comment Responses 1279.298, 1279.308, and 1279.309.

1279.321

All proposing States complied with the land acquisition requirements defined in the ISP (see EIS Volume I, Chapter 6, Sections 6.2.20 and 6.2.21). The DOE acknowledges the State of Illinois' Good Neighbor Legislation as a mitigation of potential secondary impacts of the SSC project. Secondary impacts of the SSC, especially the development of ancillary facilities, are presented in Volume I, Chapter 5, Section 5.2.15. Mitigation measures are summarized in Volume I, Chapter 3, Section 3.6.

1279.322

The referenced attached report was reviewed during the site selection process and the preparation of the final EIS. These suggestions would be reviewed during the preparation of the Supplemental EIS if Illinois is the selected site.

1279.323

The DOE used a common methodology to prepare comparable cost estimates for the seven site alternatives. These were used in the socioeconomic analyses (EIS Volume IV, Appendix 14). Summary cost estimates (means and ranges) are contained in Volume IV, Appendix 2. See also Comment Response 1276.01 and Volume III, Chapter 3.

1279.324

The single-campus design represents a modification of the proposal and is not in conformance with the ISP conceptual design.

If Illinois were chosen as the selected site, the single-campus design might be considered as an alternative during the site-specific design, and evaluated in the Supplemental EIS.

1279.325

All submitted information was reviewed in the preparation of the EIS. See Comment Response 19.01.

1279.326

Comments noted.

1279.327

Comments noted. All comments were considered by the DOE in the preparation of the EIS.

1279.328

Comment noted.

1279.329

It is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance applicable environmental statutes, regulations, and standards. See EIS Volume I, Chapter 6, Section 6.1.

EIS Volume III details the site selection methodologies.

1279.330

There are minor variances among site alternatives. However, state-specific cost estimates are used for the socioeconomic analyses (see EIS Volume IV, Appendix 14, Section 14.2).

1279.331

The DOE did not do a detailed cost-benefit analysis. The report on the site selection methodology and results (see EIS Volume III) contains a comparison of life cycle costs at the alternative sites.

1279.332

See Comment Response 904.I.

The items listed in this comment and the A.T. Kearney report were considered in the STF Report Cost Analysis.

125113003358890

1279.333

The total cost estimated for decommissioning the SSC is $38.5 million (see EIS Volume IV, Appendix 3). This entire amount would not be saved by siting the SSC at Fermilab. Specific information regarding decommissioning, including additional NEPA review, will be developed prior to a decision on decommissioning.

1279.334

Potential cost savings resulting from the use of the Tevatron facility are addressed in Comment Response 1276.01.

1278.335

The quality and completeness of the geotechnical database for each of the seven sites is addressed in EIS Volume I, Chapter 4, Section 4.1, and is considered adequate for site selection. Availability of experienced work force and appropriate infrastructure is detailed for each of the seven sites in the site-specific sections of EIS Volume IV, Appendix 14. For comments on contingency provisions, see Comment Response 981.03.

Regarding the availability of a skilled labor force, see Comment Response 816.01.

Regarding cost estimate adjustments for the Illinois site, see Comment Responses 981.04 and 1276.01.

1279.336

The use of Fermilab is included in the analysis of impacts in Illinois. Also see EIS Volume III for site selection methodology.

1279.337

This information is consistent with that in EIS Volume IV, Appendix 4.

1279.338

The savings in construction materials attributable to using Fermilab have been accounted for in the EIS Volume I, Chapter 5, Table 5.6-1. Costs, likewise, have been accounted for in Volume IV, Chapter 2, Section 2.4.2.2. The land requirements have been addressed in Volume IV, Appendix 4.

1279.339

A comparison of State-proposed infrastructure to support the SSC is presented in Volume I, Chapter 3, Table 3-3. The comment is not entirely consistent with the information presented in the Table. Tennessee has the least requirement for new and upgraded roads (25 mi vs. 28 mi for Illinois). North Carolina, Tennessee, and Texas did not propose new

rail sidings while Illinois did. Illinois does have the least requirement for infrastructure improvements for electric, gas, and water supply. The conclusion can be reached that due to the existing Fermilab and the generally urban nature of the eastern half of the Illinois site, extensive infrastructure exists in the site area.

1279.340

The comparison of impacts at the seven sites is presented in Volume I, Chapter 3, Section 3.4.

1279.341

Considering the overall cost of the SSC project, the cost of decommissioning is relatively minor (less than one percent of project cost). In addition, selection of the Fermilab as the site for the SSC would not totally avoid "duplication of this burden" as suggested. There would still be the cost of decommissioning the collider ring, the service areas, the interaction halls, and the removal of any radioactive and hazardous waste. Decommissioning costs of the injector complex (approximately one million) will be saved. Please see Table B.1 of reference 1 at the end of Volume IV, Appendix 3 for substantiating cost data.

1279.342

The EIS assumes that Fermilab would not close if the SSC were sited in a state other than Illinois. This assumption is consistent with current DOE policy.

See Comment Responses 864.01.

1279.343

See Comment Response 1276.01.

1279.344

A comparison of impacts of the seven site alternatives is presented in EIS Volume I, Chapter 3, Sections 3.4 and 3.6.

1279.345

This is consistent with how this EIS was prepared. Also see Comment Response 1279.356.

1279.346

The DOE believes the EIS accurately reflects the potential impacts and mitigations for the Illinois site proposal including those mitigations in the March 15, 1988, submittal. The modifications proposed in the comment are assumed to minimize impacts. Therefore, analysis is considered to present an upper bound of potential impacts, and assures

equitable treatment of all proposers. Until the collider ring location is determined during final design by the DOE, exact acreages, parcels, and ownerships cannot be determined. These will be assessed in the

Supplemental EIS. However, the EIS analysis does reflect an accurate picture of conditions that would exist should the SSC be sited in the referenced area (see Volume IV, Appendix 4, Section 4.1).

1279.347

The EIS included an analysis of mitigations which was consistent with the conceptual design of the SSC presented in the ISP. The proposers were responsible for the information submitted to meet the requirements of the ISP. To ensure equity among the proposers, the DOE used the proposals and the March 15 and 31, 1988, supplement information packages in the EIS comparative siting analysis. The EIS represents the upper bound of potential impacts and ensures equitable treatment of the alternative site proposals. The specific mitigations proposed by the State in land acquisition, tunnel and shaft excavation, and infrastructure improvements, are found in Volume IV, Appendix 1 and 14.

1279.348

The SSC conceptual design as presented in the Invitation for Site Proposals (ISP) provides for two so-called cluster areas. Initially, experimental halls would be located in the near cluster area which includes the main laboratory, office, and support buildings. At a future time, additional experimental halls would be located in the far cluster area. This comment constitutes a modification of the Illinois SSC proposal and differs significantly from the Illinois proposal. In order to treat all sites fairly, the EIS is based on proposals and modifications to proposals accepted by the SSC Site Task Force through March 31, 1988. The single cluster proposal might be applicable to all sites, and might be considered as a design alternative in the Supplemental EIS for the selected site.

1279.349

See Comment Response 1279.202.

1279.350

Comments noted.

1279.351

See Comment Response 348.03.

1279.352

Regarding the number of wells affected, see Comment Response 979.02. All states have committed to providing alternative water supplies to

individuals whose well must be closed due to proximity to SSC facilities or which are affected by SSC construction. This is indicated in EIS Volume IV, Appendix 7, Section 7.2.3.

1279.353

The State of Illinois proposal states that groundwater would provide the water source for both on-site and off-site SSC water needs. Most of the water would be drawn from deep aquifers with some additional supplied drawn from shallow aquifers. The proposal mentions plans to import Lake Michigan water to communities east of the site and the possibility of other local surface water sources, but it does not specifically state that these are alternatives for the SSC. These alternatives are described in Volume IV, Appendix 5, Section 5.3.2, and they are considered in terms of potential impact mitigation in EIS Volume IV, Appendix 7, Section 7.2.3.3. Minor revisions were made to the latter section to indicate the potential mitigative aspects of increased reliance on surface water supplies. The section also points out that increased reliance on shallow groundwaters is possible but would require additional evaluations to minimize impacts on shallow wells. See also Comment Response 1279.115. Legal aspects relating to the supply of water, such as the acquisition of existing water rights, are the responsibility of the proposing States; however, differences between sites in the difficulty of obtaining the needed water supplies will be considered in the site selection.

1279.354

The wetland assessment has been revised to include reevaluations of wetland location, type, and quality (see EIS Volume I, Chapter 5, Section 5.1.5.3 an the selected site will take into consideration encroachment on wetlands, avoiding these whenever possible. Plans to mitigate wetland impacts will be developed in consultation with the U.S. Army Corps of Engineers.

1279.355

There are two separate issues raised by the commenter. The first issue deals with the potential presence of the endangered prairie bush clover and the Indiana bat and whether either could be adversely affected by SSC development. The commenter is correct in assuming that there appears to be limited habitat for these species on the site. Limited habitat reconnaissance surveys and information obtained from the State of Illinois provides some confirming evidence to this assertion. If the Illinois site is selected for further investigation, confirmatory studies would be conducted. If it is determined that the prairie bush clover, Indiana bat, or other protected species would be adversely affected, the DOE would modify the project to avoid such impacts where possible. (See EIS Volume IV, Appendix 11, Section 11.3.3.)

The second issue deals with the apparent misconception in the term "designated critical habitat." Critical habitats are areas that have been identified as being critical to the continued existence of a listed endangered species through a legal rulemaking process. These areas are described as specific locations on a map and have legal protection; generally, species having designated critical habitats are endemic only to that area. For purposes of an EIS, habitats that are known or suspected to have a population of protected species are investigated in detail to determine the presence or absence of such species. If the presence of listed species is confirmed, and the species could be adversely affected by project development, such areas are typically avoided by project modification, if required, in consultation with the USFWS.

1279.356

Impacts were analyzed conservatively to present an upper limit of the potential impacts for the site alternatives. This approach was used for all seven site alternatives.

In the Supplemental EIS, mitigation measures would be more specifically described for the selected site based on additional design efforts for the selected site.

1279.357

As noted by the commenter, local high rates of initial water inflow into the tunnel will drop off rapidly. Additionally, to assume 5,200 gal/min/100 ft of tunnel in the interval near shafts E3 and E4 can lead to unrealistic estimates of water-handling requirements for tunneling in that area for two reasons. First, such high inflows should not be presumed to prevail over the full length of a long segment of tunnel; in carbonate rocks like those of the Galena-Platteville Group, high inflows occur only at discrete zones of fracturing. The rocks themselves have negligible water-transmitting capability, so water moves primarily along the fractures within the rock.

Some fractured zones are quite transmissive. One particularly transmissive zone was encountered in boring S19 (drilled by the Illinois State Geological Survey near shaft F3); this zone was able to transmit water about 1,000 times faster than the less-fractured rocks on either side of it. However, this fractured zone is 10 ft wide or less. Additionally, highly transmissive zones like the one in S19 are quite infrequent; only one was encountered in all of the borings tested by the Illinois State Geological Survey for the SSC project. If, hypothetically, the water-transmitting capability of the 10-ft wide zone in S19 is multiplied by, say, 10 to estimate the amount of water that will flow into 100 ft of tunnel (as was done to estimate the 5,200 gal/min 100 ft of tunnel noted in EIS Appendix 10) the result is exceedingly conservative. It is conservative because the other 90 ft of rocks -- the portion that is not highly fractured -- do not transmit water at nearly the same rate as the fractured zone does. A more realistic estimate would be found by using the fractured zone rate for 10 ft (yielding 520 gal/min) and the less-

fractured rock rate for 90 ft (yielding roughly 50 gal/min) for a total of about 570 gal/min 100 ft of tunnel. This is one-ninth of the conservative estimate, above, of 5,200 gal/min 100 ft of tunnel. Since it is exceedingly conservative to apply a fractured-zone inflow rate to a 100-ft-long section of tunnel, it would be unrealistically conservative, to do as some commenters have done, to apply the fractured-zone rate to a full 5 miles of tunnel.

A second source of error comes from assuming that a high rate of inflow would continue for a long time without being remedied by the tunnelers. The example inflow given above of 570 gal/min/100 ft would be termed an "initial inflow rate"; i.e., it is the rate at which water enters the tunnel when the tunnel boring machine (TBM) first passes through the rock. However, a grouting crew will follow closely behind the TBM; this crew's purpose is to plug or "grout" fractures from which water is flowing. They do this by drilling a hole into the tunnel wall so that it intercepts the fracture. They next force cement (under high pressure) into the drillhole and outward along the fracture to literally cement the fracture closed and stop it from transmitting water. (The cement plugs only a small zone of rock immediately around the tunnel, so it does not change groundwater flow patterns in the aquifer and it does not affect yields of water wells.) On a first-pass grouting campaign, water inflows are easily reduced to one-tenth of the initial inflow rate. If too much water is still entering the tunnel to suit the purpose of a particular project (the SSC needs a relatively dry tunnel), additional grouting campaigns are done until water inflow is reduced to very low, acceptable rates. In short, at any point in time during the tunnel excavation, the initial inflow rate will be experienced only over a tunnel length of 100 ft or less. This is the length of tunnel immediately behind the advancing TBM that has not yet been grouted. The remainder of the tunnel will have already had its weeping fractures sealed by grouting so that the inflow is reduced to a very low rate.

Based on the above correct understanding of how tunnel inflows should be estimated and how they are handled in actual practice, it is possible to provide realistic water handling requirements for construction in the E3-F3-E4 area as follows:

- Long-term water inflow (inflow at the end of tunnel construction and during operations) will not exceed 5 gal/min 100 feet in any individual segment of tunnel; most likely, a series of grouting campaigns will reduce the overall average to much less, perhaps 0.5 gal/min 100 ft. This residual inflow could be used for cooling water or other purposes, or could be permitted and reinjected or discharged. Every effort would be made to avoid simple discharge of the residual flow.

- During construction, before the tunnel is completely grouted, average water inflow into a given segment of tunnel (i.e., the 2.5 mi of tunnel between any two shafts) will not exceed 100 gal/min; this conservatively assumes that the grouting crews are lagging 200 feet behind the TBM.

- If, during construction, an unusually water-transmissive fractured zone is encountered, there may be an inflow of up to 600 gal/min from that zone for several days before the inflow is brought under control by grouting or other engineering measure.

One two-acre settlement (silt retention) pond at each shaft location will be adequate to handle the first two items above, while also providing "surge capacity" to handle a potential extreme inflow like that noted in the third bullet.

Volume IV, Appendix 10, Section 10.2.3.3 and Appendix 7, Section 7.2.3 have been revised to reflect this understanding.

1279.358

In preparation of the EIS, the DOE considered all submitted information. See Comment Response 13.02. The land requirements of the SSC have been assessed for each site for impacts. See Volume IV, Appendices 4 and 14 for discussion of impacts; mitigating impacts of construction on regional resources are discussed in Volume IV, Appendix 1. Decommissioning will be detailed in a plan, when the action is proposed. Volume I, Chapter 3, Table 3-3 presents a comparative analysis of major impacts at the site alternatives.

1279.359

See Comment Response 1279.351.

1279.360

These observations are consistent with procedures followed. All states received requests for additional information in one or more areas of analysis.

1279.361

See Comment Response 13.02. Comparable analyses were conducted and presented for each of the seven site alternatives (see EIS Volume I, Chapter 3).

1279.362

Your comment on the availability of geotechnical data at the Illinois site has been noted. The purpose of this EIS is to select the site for the SSC. The availability of geotechnical data for all seven sites is sufficient for this purpose. See Comment Response 1279.107 regarding additional soil geotechnical data.

1279.363

Worst reasonably foreseeable case analyses are also used when the design of the proposed action is only conceptual or exact siting of facilities in doubt (40 CFR 1502.22). These conditions were in effect during the preparation of this EIS. The supplemental EIS to be prepared on the selected site would utilize more representative analyses based on site specific design data available at that time.

1279.364

The DOE believes that the data analysis and methodology used in the EIS were applied in a fair and equitable manner to all site alternatives. Similar issues have been raised by other proposers who also stated that their proposal was much more complete and responsive than any other proposal, concerning the interpretation of proposal data. The DOE believes the EIS is sufficient in its analysis of the potential impacts for a siting decision. See Comment Response 13.02.

1279.365

Volume I, Chapter 3, Table 3-7 footnotes have been revised to reflect the results of surveys completed up to date. The states were not required to submit complete surveys of the full extent of SSC areas; this would be completed after the site was selected.

The DOE used as up-to-date information as could be provided. Where errors have been detected they have been corrected in the EIS (see Errata for Appendices 1-16, and revised Volume I). Where more current data have been identified since the publication of the DEIS which enhance or alter the analysis, they have been included in the EIS.

1279.366

See Comment Response 1504.01.

1279.367

Mitigations are discussed to the extent possible at this stage of design in EIS Volume I, Chapter 5. Further information will be provided in the Supplemental EIS. See Comment Response 508.01.

1279.368

Specific mitigations for potential adverse impacts must wait for further developments of detailed design of the SSC. If the proposed Illinois site is selected for the SSC, the DOE and its contractors will work closely with Illinois officials regarding the State-proposed mitigations to minimize adverse impacts. These and other mitigations would be addressable as design begins to be more detailed, and would be presented in the Supplemental EIS. A summary of DOE committed mitigations and mitigation plans is presented in EIS Volume I, Chapter 3, Section 3.6.

1279.369

The DOE reviewed the State of Illinois' Citizens Assistance Program. If Illinois were the selected site DOE would coordinate with State officials as they implement the land acquisition program. The Citizens Assistance Program, and the land acquisition program in general, is the responsibility of the proposing State.

1279.370

The Illinois Bill called "Good Neighbor" Legislation (House Bill 3512) has been reviewed by the DOE during the site evaluation process and the preparation of the final EIS. Land acquisition, and any compensation measures offered to local governments or landowners (whether proposed fee simple or stratified fee estates), are the responsibility of the proposer. Secondary impacts of the SSC on socioeconomics and local land owners are discussed in the EIS Volume I, Section 5.2.

1279.371

The mitigation measures suggested in the comment are valid. They essentially echo the planned monitoring and mitigation procedures described in EIS Volume IV, Appendix 9, Section 9.2.2, and in the Illinois "Good Neighbor" legislation which is summarized in the Errata to EIS Volume IV, Appendix 9, Section 9.2.3.3.B 1. (See Comment Response 1279.48.)

1279.372

New roads to be constructed if the SSC is located in Illinois and existing road upgrades are discussed in the EIS Volume IV, Appendix 1. See Comment Responses 1288.02 and 1454.02 for more discussion of access to I-88. Refer to Comment Response 1454.02 for discussion of impacts to existing roads due to commute and construction vehicle traffic. Refer also to Comment Response 1095.02 for discussion of traffic impacts due to spoils hauling.

1279.373

The DOE will require its contractors (both the construction and the Management and Operations contractor) to comply with all applicable Federal, State, and local environmental safety and health guidelines, criteria, standards, and regulations. This is generally implemented through the contract mechanism.

As stated in EIS Volume I, Chapter 6, the DOE will include a Health and Safety Clause in any contracts it negotiates with SSC contractors. These clauses will specify compliance with DOE Orders, including the 5400.1 Environmental Policy Statement. Included in these Orders will be requirements for the presentation to and approval by the DOE of Environmental Safety and Health Protection Plans. These plans will include provisions for mitigative measures such as those indicated to be implemented during both construction and operations of the SSC. Currently,

the DOE is in the process of selecting a Management and Operations contractor, and the plans have not been prepared or presented for review. However, prior to initiation of construction or operations, the DOE will conduct an operational readiness review during which mitigative measures will be considered for inclusion in the implementation plans.

1279.374

See Comment Response 1089.02.

1279.375

The existing transportation facilities are discussed in EIS Volume IV, Appendix 5, Section 5.3.11.2; the proposed improvements and the impact of SSC on traffic is discussed in Volume IV, Appendix 14, Section 14.2.1.3 C. This analysis concludes that some of the roads in the site area are currently congested and that SSC traffic would exacerbate this congestion. It is acknowledged that activities by the State to improve roads could mitigate this congestion.

1279.376

The comment suggests several health and safety measures that the DOE would consider implementing as part of the construction and operations phases of the SSC project, should it be located at the proposed Illinois site. Health and safety during construction and operations of the SSC was addressed in Volume IV, Appendix 12, Section 12.3 of the EIS. Site-specific health and safety considerations will be addressed in the Supplemental EIS.

1279.377

The observations concerning land use are consistent with the analyses presented in Volume IV, Appendix 13, Section 13.1. See Comment Response 857.04 for a statement on revised prime and important farmland resources potentially impacted by the construction of the Project. See Comment Response 958.04 for a statement on the amount of wetlands potentially impacted by the construction of the SSC Project. See Comment Response 275.04 for a statement on DOE policy regarding outleasing of property as a mitigation measure to countervail the loss of farmlands. See Comment Response 1000.03 for a discussion of the amount of land to be disturbed temporarily and permanently which will require planning for mitigative measures.

Should the Illinois site be selected, mitigation measures such as the ones suggested would be considered along with others and evaluated as part of the Supplemental EIS (see EIS Volume I, Chapter 3, Section 3.6). The opportunity costs were evaluated as the differences between the socioeconomic impacts (Volume I, Chapter 5, Section 5.1.8) and the no-action alternative (Volume I, Chapter 3, Section 3.3).

1279.378

Regarding the potential benefits to aquatic habitats or recreation from discharge of seepage water, insufficient information exists on the final number and character of discharge points for the DOE to make this claim in the EIS.

See also Comment Responses 979.02, 1279.115 and 1279.141.

1279.379

It is noted that the State of Illinois predicts that there would be enough existing excess capacity to handle sewage and solid waste that would be generated by the SSC facility.

It is also noted that existing practices at Fermilab are sufficient to handle the current generation of hazardous and radioactive wastes and would be able with only slight modification to handle the small increases in these wastes that would result from the addition of the SSC on Fermilab.

These observations are consistent with those of the EIS Volume IV, Appendices 10 and 12.

1280.01

Comment noted.

1281.01

See Comment Response 904.01.

1282.01

Comment noted.

1283.01

Comment noted.

1284.01

See Comment Response 1276.01.

1285.01

See Comment Response 816.01.

1286.01

Comment noted.

1287.01

See Comment Response 816.01.

1288.01

Comment noted.

1288.02

Several options and mitigations will be considered during construction planning to ensure the safety of SSC area residents. Tunnel machines could operate in the different quadrants, so that the spoil truck traffic would be distributed among the four quarries and several roads. The trucks need not go to the nearest quarry if unsafe conditions exist Temporary storage would be provided near each shaft so that the truck traffic could be minimized during certain hours. Additional disposal sites may be considered. The objective of the EIS is to identify the impacts of SSC on all the residents, including children, of the affected area. A Supplemental EIS for the selected site will address options and mitigations in greater detail.

1288.03

See Comment Response 1369.09.

1289.01

Comments noted.

1290.01

See Comment Responses 972.01, 974.01, 1013.02, and 1279.115.

1291.01

Fire protection services have been included in the conceptual design of the SSC. A description summarizing the extent of fire protection in the conceptual design is found in Volume IV, Appendix 1, Section 1.1.2. Additionally, the discussion of public services in the portion of the EIS dealing with environmental consequences and mitigative measures (Volume I, Chapter 5, Section 5.1.8) explains that the DOE Management & Operating contractor, who would oversee and operate the project's fire protection services, would also work with local public agencies to coordinate services and provide emergency planning for the SSC facilities and host community, as is currently the case with other national laboratories.

1291.02

Emergency services during the construction phase of the project, including rescue, would likely be provided by local public agencies currently

responsible for such services. If the North Carolina site proposed for the SSC were selected, the primary responsibility for emergency services would fall on the Butner Public Safety Department. No special provisions for emergency services are identified for the SSC until construction is complete.

1291.03

Estimates of additional capital expenditures required by local jurisdictions to accommodate SSC-related population increases were made cumulatively for all jurisdictions within each of the primary impact counties in North Carolina, including Durham County. Detail of the EIS assessment of the impacts of SSC construction and operations on both State and local government finances is presented in the EIS Volume IV, Appendix 14, Section 14.1.3.5.D.

1292.01

This letter was received during the public comment period after the publication of the Draft EIS. The scoping process was conducted prior to the publication of the DEIS.

1292.02

Comments noted.

1292.03

See Comment Response 1275.02.

1292.04

See Comment Response 1292.05.

1292.05

The wetlands assessment presented in the EIS has been revised to include a reevaluation of wetlands location, type, and quality (see EIS Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Sections 11.3.3.3 and 11.3.7.3). A conservative estimate of the amount of wetlands that may be impacted by construction of the proposed collider facilities at the SSC in Illinois is approximately 199 acres. For the Texas site this value is 2.8 acres. If future expansion areas are developed, the potential exists for about another 294 acres of wetland impacts in Illinois and 37 acres in Texas. It is the DOE policy to avoid wetlands impacts where practicable and in accordance with requirements of Section 404 of the Clean Water Act and Executive Order 11990, Protection of Wetlands. As a result, the actual impact to wetlands may be much lower than the estimate presented above. Detailed plans to mitigate, to the extent practicable, any anticipated wetlands impacts at the selected site would be developed in consultation with the U.S. Army Corps of Engineers (or delegated State authority) and analyzed in detail

in the Supplemental EIS. Mitigation is discussed in general in the EIS sections mentioned above and summarized in Volume I, Chapter 3, Section 3.6. Volume I, Chapter 5, Section 5.1.5.3 explains the difference in wetlands acreages reported between the DEIS and the EIS. Not having precise locations for various construction areas within Fermilab for areas A, B, and C, conservative estimates were used (see EIS Volume IV, Appendix 11, Section 11.2.2).

1292.06

See Comment Responses 1007.03 and 1007.04.

1292.07

As noted in EIS Volume IV, Appendix 5, Section 5.3.6.2, Fermilab and the Kerr-McGee Chemical Corporation are two facilities that contribute minimally to the natural background radiation levels at the proposed Illinois site. For Illinois (EIS Volume I, Chapter 5, Section 5.1.6.2), the dose equivalent rate from background radiation from all sources, including the two noted above, is 401 mrem/yr. This compares to the dose equivalent from the construction and operations of the SSC in Illinois, which is less than 0.001 percent of background radiation. The projected radiation levels from normal operations will not pose a health hazard and will not significantly add to the existing background levels.

Existing background radiation levels are not likely to be considered as an evaluation criterion for selecting the SSC location, because this factor would not adversely affect siting, construction or operations of the SSC (see EIS Volume III, Chapter 1).

1292.08

As listed in EIS Volume IV, Chapter 4, Table 4-14, there are more nuclear power plants near Illinois than near other sites (although Texas has the greater number of NRC licensees). However, the emissions from these facilities are very small compared to background levels.

See Comment Response 1007.13.

1292.09

See Comment Response 1007.11.

1292.10

See Comment Response 854.17.

1292.11

See Comment Response 1217.01.

1292.12

The SSC site evaluation process described in the EIS was developed by the DOE to assist in the selection of a site that will facilitate research productivity and overall facility effectiveness while avoiding adverse environmental impacts. Should the Illinois site be selected, detailed analyses of the project area will be completed so that impacts to particularly sensitive environments will be avoided or mitigated.

1293.01

Comment noted.

1293.02

A comparison of traffic conditions is discussed in Volume I, Chapter 5, Section 5.1.8.6 and Volume IV, Appendix 14, Section 14.2.1.3.C.1.b. This comparison indicates that the lowest Level of Service (LOS) on local roads is projected to be LOS F (Forced or breakdown flow with traffic exceeding the capacity of the road) during both construction and operations.

1293.03

The table accompanying the text in EIS Volume IV, Appendix 5, Section 5.3.11.1 presents level of service (LOS) ratios for the Nation, State of Illinois, and the Illinois Region of Influence (ROI) and its nine component counties. Inspection of the text and accompanying tables in Volume IV, Appendix 5, Sections 5.1.11.1, 5.2.11.1, Volume IV, Appendix 5, Section 5.4.11.1., and Volume IV, Appendix 5, Sections 5.5.11.1.C, 5.6.11.1.C, and 5.7.11.1.C reveals that of all key public services considered, the Illinois Region of Influence maintains the lowest LOS ratio only for public health care. Additional examination shows that the Illinois Region of Influence maintains the highest LOS ratio for police protection of all seven sites under consideration for SSC development.

SSC-related impacts to public services in the Illinois Region of Influence (ROI) are addressed in EIS Volume IV, Appendix 14, Section 14.1.3.3.C.

See also Comment Responses 867.03 and 1314.18.

1293.04

See Comment Response 1007.01.

1293.05

EIS Volume IV, Appendix 10 presents the worst-reasonably foreseeable case by assuming the maximum number of 290 trucks going to Quarry #1. Average truck traffic would be lower. Also, the EIS mentions four quarries

selected by the State of Illinois. Additional disposal sites as well as several options to reduce the traffic problems may be considered if necessary during construction planning. Spoils disposal and the transportation of spoils will be addressed in greater detail for the selected site in the Supplemental EIS.

1293.06

See Comment Response 41.02.

1293.07

The potential impacts on construction activities due to inclement weather have been accounted for in site-specific cost estimates. See EIS Volume IV, Appendix 2.

1293.08

See Comment Response 1486.03.

1293.09

Comments noted.

1294.01

Comment noted.

1294.02

National ambient air quality standards (NAAQS) and all applicable state ambient air quality standards (AAQS) will be complied with during both construction and operations of the SSC. As stated in EIS Volume I, Chapter 6, it is the DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with applicable environmental statutes, regulations, and standards.

Volume I, Chapter 4 (Section 4.4.2), and Volume IV, Appendix 8 (Section 8.4.3.2) of the DEIS incorrectly identified the compliance status for carbon monoxide as nonattainment for the Illinois SSC counties. The EIS has been revised accordingly.

The SSC-related emissions of CO, NOx, and VOCs during operations are almost entirely (greater than 95 percent) due to off-site commute traffic. The emissions resulting from this traffic constitute a fraction of a percent of the existing traffic contributions of these pollutant emissions.

Fugitive dust emissions during construction is a concern. Volume I and Volume IV, Appendix 8 have been revised to include for all States mitigations on TSP and PM_{10} emissions during construction. Specifically, the use of chemical soil stabilization instead of twice-daily watering

for control of general site activity emissions significantly reduces the generation of fugitive dust emissions and hence the resulting ambient air impacts for these pollutants.

Additional air quality analysis will be performed after site selection and included in the Supplemental EIS for that site. The availability of more definite design and construction planning information at that time will allow that analysis to be more detailed and contain more specific mitigation commitments.

Compliance with the AAQS will be addressed by the host state when its air pollution regulatory agency reviews any required permit applications.

1294.03

The U.S. EPA recently disapproved the Illinois State Implementation Plan (SIP) ozone control strategy for the Chicago nonattainment area and also extended a construction ban on major new stationary sources of volatile organic compounds (and major modifications of such sources) in four Chicago area counties, including Kane and DuPage (53 FR 40415, October 17, 1988).

The construction ban has been in effect since 1981 (see Citizens for a Better Environment v. EPA, 649 F.2d 522). Since the ban applies only to major stationary sources and major modifications, it would not apply to the SSC (see Volume I, Appendix 8, Section 8.1). However, if the Illinois site is selected, the state will be required to consider the SSC emissions in proposing a modified ozone attainment strategy as a revision to its SIP. No decision has been rendered in the case (State of Wisconsin v. U.S. EPA, Civil No. 87-C-0395, E.D. Wis.), although EPA has moved for a dismissal.

1294.04

DOE is committed to avoid or minimize wetlands impacts, to the extent practicable, in accordance with Executive Order 11990 and DOE regulations 10 CFR 1022 regarding protection of wetlands. The EIS (Volume I, Chapter 3, Section 3.6 and Chapter 5) includes further discussion of the feasibility of wetlands mitigation.

1294.05

The EIS is being prepared as a requirement of the National Environmental Policy Act. The proposed SSC will comply with all applicable Federal requirements including those of the Corps of Engineers and the U.S. Fish and Wildlife Service. After selection of a site, further assessment of impacts would occur as part of final design and be presented in the Supplemental EIS.

1294.06

Comments regarding bedrock conditions and methods of completion of a portion of wells at the Illinois site are noted. The comment is correct in that in a fractured bedrock environment, the potential of an effect being observed at some distance from a disturbance is greater than in a porous media if the well and the disturbance intercept the same fracture or fracture system. Often, however, even nearby fractures are not directly connected, and the effects of a disturbance may not be observed over a short distance. The manner of well construction would not be a major factor in determining whether an effect would occur.

See Comment Response 979.02 regarding estimates of the number of wells potentially closed at the Illinois site due to siting and construction of the SSC.

1294.07

Comment noted.

1296.01

Comments noted.

1296.02

See Comment Response 1314.02.

1296.03

See Comment Response 876.10.

1296.04

Comments noted.

1296.05

See Comment Responses 922.11 and 1369.09.

1296.06

Comments noted.

1297.01

Comment noted.

1297.02

See Comment Response 1275.12.

1297.03

See Comment Response 1007.03.

1297.04

See Comment Response 854.17.

1297.05

See Comment Response 1007.11.

1297.06

Comment noted.

1298.01

Comment noted.

1298.02

See Comment Response 1344.01.

1298.03

See Comment Response 1344.02.

1298.04

See Comment Response 1344.03.

1298.05

See Comment Response 1344.04.

1298.06

See Comment Response 1344.05.

1298.07

See Comment Response 1344.06.

1298.08

See Comment Response 1344.07.

1299.01

The comment notes that recent growth in the Illinois Region of Influence (ROI) has led to an increased tax burden. As stated in the baseline section of the EIS, the Illinois ROI grew slowly between 1969 and 1984 relative to growth throughout the rest of the United States (see EIS Volume IV, Appendix 5, Section 5.3.11.1.A). More recently, there has been evidence of an increased level of economic growth in the region. This evidence includes decreasing unemployment rates at the same time as the number of workers in the labor force was increasing.

The EIS methodology correlates increased capital infrastructure expenses with increased growth rates based on information from the President's Economic Adjustment Committee (1981) (see EIS Volume IV, Appendix 14, Section 14.1.2.3.B.4). The primary impact counties surrounding the Illinois site are expected to receive a moderate level of in-migrants in comparison to the other six sites (see EIS Volume I, Chapter 5, Table 5.1.8-4). Local jurisdictions in DuPage and Kane counties would incur expenses to accommodate this growth during the first three years of construction (Kendall County is expected to incur only a small level of in-migration and would not incur any major losses). In the following years, each of the three primary impact counties is projected to receive a net fiscal benefit from SSC construction and operations. More detail regarding the fiscal impact analysis is provided in EIS Volume IV, Appendix 14, Section 14.1.3.3.D.

See Comment Response 867.03 regarding the use of "level of service" as a key indicator for local public service baseline conditions and potential impact assessment.

1300.01

It is true that of the seven sites, the Illinois site does have a relatively high annual snowfall, though it is in fact identical to that of the Colorado and Michigan sites. If one of these sites is selected for the SSC, standard construction scheduling techniques would be utilized to ensure that disruption due to snowfall is kept to a minimum.

1300.02

See Comment Response 1300.01.

1300.03

Comment noted.

1301.01

Comment noted.

1301.02

See Comment Response 839.03.

1301.03

The comment is consistent with EIS Volume IV, Appendix 4.

1301.04

See Comment Response 1369.09.

1301.05

See Comment Response 880.04.

1301.06

The potential air and noise pollution, airborne radionuclide exposure, and other environmental impacts from SSC will not adversely affect human health and welfare during the construction and operations of the collider project. Through the implementation of air, noise, water and radiation protection mitigation measures any potential impact will be kept as low as practically achievable. It is DOE's policy to assure it and its operating contractors comply with applicable statutory requirements affecting federal facilities. State and local regulations will be addressed as part of the mandatory DOE compliance program that will be monitored through regularly scheduled health and safety appraisals conducted by DOE contractors and audited by DOE personnel. Prior to start-up, the DOE requires its operation and maintenance contractors to submit to an operational readiness review (ORR) during/or at which proposed environmental monitoring plans are submitted for review. All applicable environmental and safety operating permits required to assure the health and safety of the public and the site work force will be reviewed for regulatory thoroughness and adequacy. State and local permits will be discussed, as appropriate, and included if required in the site-wide environmental compliance plan. EIS Volume I, Chapter 6 discusses the Federal statutes (i.e., permits, licenses, and other entitlements) which may be applicable to the construction and operations of the SSC. See also Comment Response 1369.09.

1301.07

See Comment Response 1369.09.

1301.08

Proposers were offered the opportunity to provide a site for the SSC. While DOE provided guidance concerning the siting requirements and site specifications necessary for the SSC, DOE did not specify specific states or locations within a state which should be proposed. That aspect was left to the discretion of individual proposers. The population impacts to Kane and DuPage counties can be found in the EIS, *Appendix 14, Section 14.1.3.3.*

1302.01

Land resources in Illinois are discussed in the EIS, Volume IV, Appendix 5, Section 5.3.10. The methodology for site selection is discussed in Volume III of the EIS.

1302.02

See Comment Response 865.01.

1302.03

See Comment Response 1259.02.

1302.04

See Comment Response 1126.05.

1303.01

The number of wells which may have to be closed due to SSC siting and construction at the Illinois site was not accurately presented in Volume I of the DEIS. At the Illinois site, in excess of 320 wells are located within the SSC footprint (1,000 ft corridor along tunnel and campus and *experimental areas). The State estimates that on the order of 6 to 30* wells may be directly affected and required to be closed. The State has indicated that an alternative water supply would be provided to affected well owners.

1303.02

The 1,000-ft easement is not because the SSC is dangerous. The 1,000-ft requirement is intended to give flexibility in setting the boundaries of the final site configuration and adaptability of the SSC design to local conditions. These are needed to accommodate future refinements of the basic design to fit the chosen site.

1303.03

See Comment Response 880.04.

1304.01

The attached report was reviewed during both the selection process leading to the BQL and the preparation of the EIS. Specific mitigations for possible adverse impacts will be addressed in the Supplemental EIS for the selected site should Illinois be chosen.

1305.01

See Comment Responses 533.03 (groundwater supply), 1133.02 (impacts on individual wells), and 1200.04 (radium contamination in groundwater).

1306.01

Quality of life impacts are discussed in EIS Volume IV, Appendix 14, Section 14.1.3.3.E. See also Comment Response 1002.01.

1307.01

See Comment Response 1369.09.

1307.02

See discussion of mitigations in the EIS Volume I, Chapter 3, Section 3.6.

1307.03

See Comment Response 1007.01.

1307.04

Comment noted.

1308.01

The high radium content of certain water supplies in Illinois is addressed in EIS Volume I, Chapter 4, Section 4.6.1.1.D. Also see Comment Response 1122.02.

1308.02

While no guarantee can be given that a particular well will not be contaminated as a result of the project, groundwater quality impacts on both shallow and deep aquifers are not expected. Impacts from sedimentation will be minimized through construction controls. Detailed assessments, including impacts on wells will be performed for the selected site and documented in a Supplement to the EIS. Groundwater impacts, including water quality, are assessed in EIS Volume IV, Appendix 7, Section 7.2.3.3. See also Comment Responses 18.03 (groundwater quality impacts), 870.04 (radiological impacts), 7.03 (potentially affected wells), and 1133.02 (compensation to affected well owners).

1308.03

See Comment Response 1308.02.

1309.01

Based on a post-DEIS wetland survey, the wetland referred to would be approximately 600 ft from the proposed E8 site. At this distance, and with sedimentation and erosion controls being implemented, significant impacts would be minimized. If Illinois is selected as the site, more detailed mitigation plans would be developed in consultation with appropriate agencies (e.g., U.S. Army Corps of Engineers) (see Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.3.3).

1310.01

In EIS Volume I, Chapter 1, the EIS refers to benefits expected to result from the SSC, including spin-off technology which could have applications to such fields as medical diagnostics, computers, and superconducting magnet technology.

1311.01

Comment noted.

1312.01

Traffic analysis for the Illinois site is presented in the EIS in Volume IV, Appendix 14, Section 14.2.1.3. In addition, Volume I, Chapter 4, Section 4.9.2.1 acknowledges that roads in the Illinois site area generally experience a lower level of service than roads at other sites. Also noted in this section is that the Illinois site experienced congestion in localized areas.

1312.02

State fiscal appropriations are the responsibility of the State. ISP requirements for state support of the SSC are summarized in Volume III, Chapter 3.

1313.01

Comment noted.

1313.02

Both commuting times and population were used in the spatial allocation methodology (see Volume IV, Appendix 14, Section 14.1.2.3); however, stress endured while commuting was not incorporated into the analysis.

Travel times used in the model's application were taken from information provided by the State of Colorado in response to the Site Task Force requests in June 1988 and included a travel time of 60 minutes to Brighton (assuming the existence of a proposed highway linking Brighton to the SSC site) and 80 minutes to downtown Denver. The average travel time of allocated workers, resulting from the model as used in the EIS, is nearly 1.5 times the average travel times of Denver-Boulder SMSA workers (as reported in the 1980 Census of Population and Housing).

1313.03

See Comment Response 1313.04. Volume I, Chapter 3, Section 3.1.1.2.F has been revised to clarify the serving telephone companies. Volume IV, Appendix 1, Section 1.2.2.14 has been revised in the Errata to address the AT&T fiber optics line currently under construction.

In addition, if the proposed Colorado site is selected for the SSC, the DOE and its contractors would work with local utilities to optimize service to the site.

1313.04

Volume IV, Appendix 5, Section 5.2.11.2.B.3 has been corrected in the Errata to clarify the telecommunications utilities.

1313.05

Comment noted.

1314.01

Comment noted.

1314.02

The assessment of wells potentially lost or closed due to SSC siting and construction at the site alternatives in EIS Volume IV, Appendix 7, Section 7.2.3 does not support a conclusion that more wells will be lost in Illinois than at all other sites combined. The number of wells that may be lost due to siting the SSC in Illinois was not reported accurately in the DEIS. State records indicated 320 wells within the SSC footprint; however, based on field surveys, the State estimates that only 6 to 31 wells may be directly affected and required to be closed because of the project. See Comment Response 979.02 for clarification of criteria used to assess the number of wells closed or affected and consequent revisions to EIS.

1314.03

See Comment Response 1369.01.

1314.04

The comment is consistent with data presented in EIS Volume IV, Appendix 14, Table 4-2.

1314.05

See Comment Response 839.03.

1314.06

See Comment Response 1292.05.

1314.07

See Comment Response 1279.141.

1314.08

See Comment Response 1279.357.

1314.09

See Comment Responses 533.03, 1013.02, and 1279.115.

1314.10

See Comment Responses 972.01.

1314.11

Detailed mitigative measures will be designed for the selected site and addressed in the Supplemental EIS. Floodplain encroachment assessments in EIS Volume I, Chapter 5, Section 5.1.2.2 and Volume IV, Appendix 7, Section 7.1.3.2 have been revised with additional text and figures. See Comment Response 1007.02.

1314.12

See Comment Response 1007.02.

1314.13

See Comment Response 1369.09.

1314.14

See Comment Response 1200.04.

Variable water quality conditions occur among the sites, as presented within individual site chapters in EIS Volume IV, Appendix 5, Sections 5.1.2, 5.2.2, 5.3.2, 5.4.2, 5.5.2, 5.6.2, and 5.7.2. These data are also summarized in Volume I, Chapter 4, Table 4-2. Available water quality data at all sites show violation of standards for one or more parameters. Site ranking in terms of water quality was not done. See Comment Response 1275.12.

1.14.16

See Comment Response 1007.03.

1314.17

A comparison of traffic conditions is presented in EIS Volume I, Chapter 5, Section 5.1.8.6 and Volume IV, Appendix 14, Section 14.2.1.3.C.1.b. This comparison indicates that Illinois is the only site analyzed in the EIS in which the lowest Level of Service (LOS) on local roads is projected to be LOS "F" (forced or breakdown flow with traffic exceeding the capacity of the road) during both construction and operation.

1314.18

Level of service ratios are not intended to be used as numerical rankings or ratings of quality. The table accompanying the text in EIS Volume I, Section 4.9.1.3, which presents levels of public services at all seven proposed sites, clearly indicates that the Illinois Region of Influence (ROI) has the lowest service ratio in only public health care. For all other public services, the Illinois ROI maintains service ratios on a par with or above ratios of other proposed regions.

See also Comment Response 867.03.

1314.19

See Comment Response 1007.12.

1314.20

See Comment Response 1007.11.

1314.21

See Comment Response 1007.04.

1314.22

See Comment Response 1278.11.

1314.23

This is a correct interpretation of the land use analyses presented in EIS Volume IV, Appendix 13, Section 13.1.

1314.24

See Comment Response 1007.13.

1314.25

While the ring crosses the Fox River and other streams, it does so at depths ranging from 280 to 360 ft. Construction of the ring tunnel under the streams will have negligible surface disturbance, hence negligible sedimentation impacts on the streams.

Construction of SSC surface facilities may impact streams. The Illinois site has the largest river, i.e., the Fox River, among the seven site alternatives overlying the tunnel alignment. However, the impact of siltation on larger streams such as the Fox River is not necessarily larger. Furthermore, with implementation of proper mitigative measures, it is anticipated that the impacts will generally be limited to the construction period and insignificant. Impact mitigations are discussed in EIS Volume IV, Appendix 7, Section 7.1.2.2 and 7.1.3.3.

1314.26

The comment is correct for most of the E and F locations of the Illinois site. Some of the locations in the western portion may be more like other sites. See the Comment Response 1196.04 for a discussion of the effect of higher background sound levels.

1314.27

See Comment Response 41.02.

1314.28

See Comment Response 1275.02.

1314.29

For the proposed Illinois site, the EIS considers only the four quarries proposed by the State for disposal of spoils. These four quarries could accommodate the total estimated amount of earth materials expected from this construction of the collider ring. The state can propose additional disposal sites that comply with applicable environmental regulations. Capacities of the four quarries and access roads will be evaluated during construction planning to minimize congestions and delays. Spoils disposal and transportation will be addressed in more detail in the Supplemental EIS for the selected site. See Volume IV, Appenidx 10, Section 10.2.3.3.

1314.30

See Comment Response 1381.11.

1314.31

The effect of the weather in Illinois has been taken into account in the cost estimate of the Illinois site in Volume IV, Appendix 2 of the EIS.

1314.32

Comment noted. See Comment Response 871.01.

1314.33

See Comment Response 880.04.

1314.34

Although a large number of wells are located in the vicinity of the tunnel at the proposed Illinois site, only a few will have to be abandoned, and impacts to other wells such as water quality or water level changes are projected to be negligible. Revised estimates of affected wells are presented in EIS Volume IV, Appendix 7, Section 7.2.3.3. Also see Comment Response 1275.19.

1315.02

Comment noted.

1316.01

See Comment Response 1126.05, Paragraphs 2 and 3. The DOE has conducted detailed evaluations of the seven BQL sites and has identified a preferred siting alternative (see EIS Volume III, Chapter 3). The Secretary of the DOE will consider all data in the EIS, the Task Force Evaluation Report, and other information which may be available in selecting the final site for the SSC.

1317.01

Comment noted.

1317.02

See Comment Response 1043.62.

1317.03

All figures in question have been revised and moved to Appendix 11 in the EIS. The new figures identify wetlands and relevant SSC facility locations as currently proposed.

13011350335889

1317.04

It is DOE policy to avoid wetlands to the maximum extent practicable, in accordance with Executive Order 11990 Protection of Wetlands. DOE appreciates the offer of assistance from U.S. Army Corps of Engineers (Wilmington District). The DOE would use their assistance if North Carolina is chosen as the selected site.

1317.05

The sentence in question has been removed from the wetlands text. Volume IV, Appendix 5, Section 5.5.2.1.B of the EIS has been expanded to define the WS-I through WS-III surface water system classifications.

1317.06

This addition has been made to the DOE SSC mailing list.

1317.07

Figures 5.5.1-1 and 5.5.2-2 of Volume IV, Appendix 5 have been revised as suggested (see Errata).

1317.08

The disturbed area in the campus and injector complex has been more accurately estimated to be 480 acres, which is about 5 percent of the drainage area of Knap of Reeds Creek (see EIS Volume IV, Appendix 7, Section 7.1.3.5). The EIS recognizes that 480 acres is a significant acreage and may have some impacts on runoff and soil erosion and mitigative measures are discussed in EIS Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.2.1 and Volume IV, Appendix 7, Section 7.1.2.2.D.2. A site-specific, detailed erosion and sedimentation control plan will be be developed for the selected site and will be documented in a Supplemental EIS, which will be provided to the public for review and comment prior to commencement of any SSC construction. A detailed erosion control plan is not necessary for the site selection purpose of this EIS.

1317.09

See Comment Response 1278.38.

1317.10

See Comment Response 1317.08.

1317.11

The proposed locations of the disposal areas are shown in EIS Volume IV, Appendix 10, Figure 10.2.3-7. These locations will be reviewed and revised, if necessary, if the Tennessee site is selected. This process will be documented in the Supplemental EIS for the selected site.

130113503358810

1317.12

See Comment Response 763.02.

1317.13

North Carolina does not propose that Falls Lake be used as a water supply source for direct SSC water requirements. Water requirements for additional off-site domestic use can be met by existing reservoirs in the project vicinity, not including Falls Lake. These reservoirs have adequate excess capacities, as discussed in revised EIS Volume I, Chapter 5, Section 5.1.2.4 and Volume IV, Appendix 7, Section 7.1.3.5.G.

See also revised EIS Volume I, Tables 1-1, 3-3, and 3-7, and Sections 3.7.3 and 5.2.3; and EIS Volume IV, Appendix 5, Section 5.5.2.1.C Errata.

1317.14

EIS Volume IV, Appendix 10, Table 10.3.3-5 presents the alternatives proposed by the State of North Carolina to treat sewage from the main campus, far cluster, and remote areas.

The cooling tower blowdown disposal details are included in EIS Volume IV, Appendix 10, Section 10.3.3.3.E.

The compositions of the effluent would be determined during the detail design phase and further assessed in the site-specific Supplemental EIS to ensure compliance with current effluent discharge standards. It is DOE policy to conduct its operations in an environmentally safe and sound manner in accordance with applicable environmental statutes, regulations, and standards. See Comment Response 627.01.

1317.15

Results of the State's recent survey of creeks and rivers in the proposed North Carolina SSC site area have been included in EIS Volume IV, Appendix 11, Section 11.3.5.2 which has been corrected to state that there were three, not two, species of rare fresh-water mussels observed in the Tar River. These three species include Alarmadonta heterodon (dwarf wedge mussel), Fusconia masoni, and Ampsilis radiata. The commenter's reference to the DEIS stating that there were four such mussels, could not be found.

1317.16

EIS Volume IV, Appendix 11 has been rewritten leaving this topic out. Volume IV, Appendix 10, Section 10.2.3.5 is correct at 17 sites.

1317.17

Comment noted.

130113503358811

1318.01

The State of Texas supplied the DOE with a copy of its SSC Facility Research Authority Act, which shows that Article 4413 (47d) was repealed and superseded by Article 4413 (47e). Article 4413 (47e) is cited in Volume IV, Appendix 4, Section 4.3.2.7 as the article authorizing the formation of the Texas National Research Laboratory Commission.

1318.02

Comment noted.

1318.03

Marl is a broad term including either sand, silt, or clay with a calcareous cement; the Taylor marl contains all of these lithologies among its various members and hence is well described by the term "marl." One member of the Taylor marl that predominates at the site, the Ozan Formation, is principally clay with calcareous cement, and accordingly is more concisely described by the narrow term "calcareous claystone."

1318.04

See Comment Response 402.01.

1318.05

Strength characteristics of the site rocks are listed in Table 5.7.1-4 of Volume IV, Appendix 5. Excavation experience with the Taylor marl in the region suggests that liners are desirable in tunnels and that slopes for open excavations should be laid back for stability.

1318.06

Volume I, Chapter 4, Table 4-1 has been clarified to note that there has been previous minor oil production.

1318.07

The Texas proposal located the medium energy booster (MEB) and the high energy booster (HEB) in underground tunneling as the comment suggests. However, cost estimates developed for the Conceptual Design Report (CDR) were based on the location of all the injector facilities near the surface in cut-and-cover construction. Redesigning the technical and conventional facilities for the Texas site and providing appropriate cost estimates based on the redesign were not considered by DOE in the EIS. Therefore, the concept of a cut-and-cover injector facility was adapted for the Texas site EIS analysis and the appropriate cost estimate was used. Exact location of each element of the injector facility will be decided during final design and alternatives evaluated in the Supplemental EIS if Texas is the selected site.

1318.08

Comment noted.

1318.09

The potential for the transfer of additional water use in the Texas site vicinity to surface water is noted in EIS Volume IV, Appendix 7, Section 7.2.3.7. However, it is assumed that some SSC water use will continue to rely on groundwater. As there are no specific data that documents that the existing overdraft condition will be reversed by the continuing conversion to surface water in the area, it is assumed that the SSC groundwater use would contribute to the existing overdraft. Surface water is identified as the primary proposed water supply source for the SSC project at the Texas site.

1318.10

Regarding surface water versus groundwater use at the Texas site, see Comment Response 1318.09. The possibility of replacing the proposed use of groundwaters at remote service areas is acknowledged. It offers an additional opportunity to mitigate potential groundwater drawdown effects caused by the project. It would be evaluated, considering also differential construction and operations costs, in the final SSC design if the Texas site is selected.

The value for groundwater use of approximately 9,000 acre-ft/yr is based on data provided by the Texas Water Development Board for Ellis County for 1985 (Texas Water Development Board, 1988: Computer printout of historical water use and projected water use through 2030 for Ellis County, Texas). These data are documented and are considered appropriate for the purposes of this EIS. While it is probable that groundwater use is declining slowly because of the emphasis on conversion to surface water supplies, the difference suggested by the two data sets is minimal and would not modify the results of assessments in the EIS.

1318.11

Comments regarding surface water supply planning in the Texas site vicinity for local communities are noted. Secondary impacts of the SSC on water resources are discussed in the EIS in Volume I, Chapter 5, Section 5.2. See Comment Response 420.02 regarding the potential conflict between the proposed SSC tunnel alignment and the construction of the proposed Red Oak Creek Reservoir.

1318.12

The text of Volume I, Chapter 6, Section 6.2.1 has been modified to indicate that Texas does have a general antidegradation policy within the Surface Water Quality Standards of the Texas Water Commission but that no limits are set.

1318.13

The intent of the cited EIS statements was that drawdowns may be noticeable at relatively large distances because the Twin Mountains/Woodbine aquifer is confined, which is true. Transmissivity was mentioned in the same sentence making the inference unclear. The cited sections have been revised in EIS Volume I, Chapter 5, Section 5.1.2.4, and in Volume IV, Appendix 7, Section 7.2.3.7.A.1 for clarity.

1318.14

The purpose of Table 4-3 (EIS Volume I, Chapter 4, Section 4.2.2) is to provide only a basic description of the primary hydrogeologic units at each site and their stratigraphic relationship if hydrologically important. This level of information is provided in the description for the Texas site and does not conflict with the comment. There was a conscious effort to minimize text in this table by limiting the use of adjectives. Detailed descriptions of Texas site hydrogeologic units and their properties and relationships are provided in EIS Volume IV, Appendix 5, Section 5.7.2.2. The important point that is noted is that the alluvial aquifers are small in extent and water yield. This section has been corrected in the Errata to acknowledge the hydrologic isolation of the deeper aquifers underneath the site from the shallow alluvial system.

1318.15

See Comment Response 217.03, second paragraph, and referenced responses 223.05 and 217.01.

1318.16

Details of the physical characteristics of hydrologic units at the Texas site are given in Volume IV, Appendix 5, Section 5.7.2.2.A. Volume IV, Appendix 7, Section 7.2.3.7 notes that the tunnel lies completely within the Austin Chalk and Taylor Marl, and is hydraulically isolated from overlying and underlying aquifers. Volume IV, Appendix 7, Section 7.2.3.7 has been revised to reflect the fact that the tunnel is above the hydraulic head in the Woodbine aquifer.

1318.17

The statements referred to are meant to suggest a minimal groundwater quality impact from septic tanks and leach fields. It is assumed that some of the SSC facilities would be near or within one of the shallow alluvial aquifers on the site and that a minor groundwater quality impact may result. No water quality impact is expected to result to the deeper confined or Twin Mountains/Woodbine aquifer. Facility locations will be determined after final design; should Texas become the selected SSC site, a Supplemental EIS will address the septic tank and leach field issues.

1318.18

The Texas Air Control Board published monitoring data was utilized as the primary source for background ambient air quality data. Neither the 1986 nor the 1987 network data summaries contained monitoring results for lead (Pb). Recent, verified Pb monitoring data was not provided by the Texas site proposer group. The Errata for Volume IV, Appendix 5 contain a note correcting the Table 5.7.4-5 emissions from "tons per year" to "pounds per hour." Refer also to Comment Response 238.02 for a discussion concerning the selection of the ambient air quality data utilized as backgrounds.

1318.19

Emission of total suspended particulate (TSP) and fine particulate matter having an equivalent aerodynamic diameter of 10 microns or less (PM_{10}) or dust during construction is certainly of concern. It is true that construction at all sites, in the broadest sense, will be similar. The EIS evaluates the impact of construction on air quality in Volume IV, Appendix 8. Forty-five of the fifty-nine tables plus the associated discussion in Volume IV, Appendix 8 address general or site-specific construction air quality impacts.

The EIS has been updated to reflect additional details of a more comprehensive mitigation program to control fugitive dust.

1318.20

The climate data used in the EIS were obtained primarily from national publications. This allowed all states to be treated the same with consistent data type, presentation format, and compilation methodologies. The partial listing of data submitted by the commenter is very similar to those used to prepare the EIS (see Volume IV, Appendix 5, Section 5.7.3). No change in conclusions would occur if these data were included and it would introduce non-uniform elements into the analysis.

1318.21

Should Texas be selected as the site for the SSC, the Supplemental EIS will address noise mitigation during construction in more detail.

1318.22

Most of the excavation will be done by mechanical means. However, excavation of shafts, some experimental halls, and some portions of the tunnels may be done by blasting. This technique was used for the preparation of the Conceptual Design Report, the LCC estimates, and the EIS. Blasting at these areas will not cause ground vibrations or noise of sufficient magnitudes to be harmful to structures, public health, or ecological resources. (see EIS Volume IV, Appendix 9, Section 9.2.3.7.B.).

1318.23

The statements are not contradictory. Although the numerical analysis indicates that the impact of doubling traffic levels on currently existing roads is not likely to increase the sound produced by the road by more than 3 dBA, any increase in traffic is likely to be noticed by those living close to roads (see EIS Volume IV, Appendix 9, Section 9.1.3.1). These people who notice the increased traffic noise may deem it annoying.

1318.24

The information contained in the Terradex Corporation report "Indoor Radon Measurements in the United States" (March 17, 1988) has been noted. Radon levels from indoor measurements were not used in projecting radon levels in the tunnels. See Comment Response 1030.12.

1318.25

Potential health and safety impacts at the proposed Texas site are addresed in Volume I, Chapter 4, Section 4.6.2.2 and in Chapter 5, Section 5.1.6.

1318.26

Volume IV, Appendix 10, Section 10.2.3.7.A is based on the information provided by the State of Texas. The actual details may change during the detail design.

1318.27

The comment is noted that the Texas Natural Research Laboratory Commission concurs with the DOE's assessment that there is enough excess capacity for sewage treatment and solid waste disposal, as mentioned in EIS Volume IV, Appendix 10. Additional options for the cooling tower blowdown water disposition can be included in the Supplemental EIS if the Texas site is selected for the SSC.

1318.28

The wetlands assessment has been revised to include the most current information on wetland location, size, type, and quality (see EIS Volume I, Section 5.1.5.3 and Volume IV, Appendix 11, Sections 11.2.2.4 and 11.3.7.3). At all site alternatives, wetlands classifications were based on those adopted by the U.S. Fish and Wildlife Service. This provided a standard, accepted approach to wetlands classification.

1318.29

See Comment Response 1547.048

1318.30

The DOE concurs with the post-DEIS assessment of the Texas Parks and Wildlife Department (TPWD) regarding the potential presence of nesting habitat for the endangered black-capped vireo on site. Results of a recent TPWD habitat survey appears to confirm this analysis; these results were reported in Volume IV, Appendix 11, Section 11.3.7.2 of the EIS. However, nesting habitat does occur within the Region of Influence for the proposed Texas site. Should the site be selected, preconstruction surveys will be made to determine the location and extent of appropriate habitat for any listed species potentially affected by project development. Results of this additional evaluation would be provided in a Supplemental EIS.

1318.31

While the lists of species referred to in the comment were reviewed and evaluated during the preparation of the EIS, the inclusion of a lengthy species list in the EIS is not necessary. However, the State's species list is included as a reference in the EIS in Volume I, Chapter 4, Section 4.7.4.2.

1318.32

Comment noted.

1318.33

The text has been revised to reflect the information provided by the comment. See EIS Volume I, Chapter 3, Tables 3-5 and 3-6.

1318.34

The values cited in the EIS are consistent with USDA statistics as stated in Volume I, Chapter 5, Table 5.2-1 of the EIS.

1318.35

Comment noted.

1318.36

See Comment Response 479.02.

1318.37

The source of the information in Volume IV, Appendix 14 regarding disbursement of motor fuels tax proceeds by the State government to county governments in Texas is the 1982 Census of Governments, published by the U.S. Department of Commerce, Bureau of the Census, Volume 6 - Topical Studies, Number 3 - State Payments to Local Governments, Table 7, page 115. This source provided data which are consistent for all seven alternative SSC sites, allowing consistent analysis appropriate to fair

comparison of impacts. Incorporation of the information newly provided in this comment would not signficantly alter the conclusions in the analysis.

1318.38

The source of the information regarding disbursement of alcoholic beverage sales tax proceeds by the State government to city and county governments in Texas is the 1982 Census of Governments, published by the U.S. Department of Commerce, Bureau of the Census, Volume 6 - Topical Studies, Number 3 - State Payments to Local Governments, Table 7, page 115. This source provided data which are consistent for all seven alternative sites, allowing consistent analysis appropriate to fair comparison of impacts. Incorporation of the information newly provided in this comment would not significantly alter the conclusions in the analysis.

1318.39

In EIS Volume IV, Appendix 5, Table 5.7.11-5, "(in thousands)" should be removed from the title of the first column of numbers.

1318.40

In EIS Volume IV, Appendix 5, Table 5.7.11-6, "(in thousands)" should be removed from the title of the first column of numbers. Also, the figure for population (footnote to table) should read "18,230."

1318.41

The source of the information in EIS Volume IV, Appendix 14 regarding disbursement of the 2.5 percent tax on telecommunications by the Texas State government is the State Tax Handbook, as of October 1, 1987, published by Commerce Clearinghouse, Inc., page 632. The repeal of the telecommunications tax, effective October 1, 1988, and the related change to taxing telecommunications expenses through the sales and use tax would result in the SSC-related net tax revenue estimate in the EIS being reduced for the State government by about $0.1 million annually beginning in the year 2000. Reductions in the EIS estimates of smaller magnitude would result in each of the years 1989 through 1999 (in relation to the increasing level of preparations and operations work occurring during those years). These reductions would result because the Federal Government and its contractors are exempt from sales and use taxes under the Texas tax code. Compared to overall revenue impacts, however, these reductions are not significant because they do not modify the conclusions reached in the EIS, and thus do not warrant revision of the EIS analysis.

1318.42

The changes in the scope of the road improvement plan for the Texas site, as suggested in this comment, are apparently based on recent

changes made by the proposer. The road improvements assumed in the EIS, and correctly referenced in the comment, are based on the original proposal information. The EIS data will not be changed, as the consequences of this change would be insignificant for the purposes of this EIS evaluation. These changes could be considered in the site-specific supplemental EIS if the Texas site is selected.

EIS Volume IV, Appendix 14, Section 14.2.1.3, refers to the 23 mi of road upgrading; however, the word "upgraded" was inadvertently left out. Even though the commenter correctly interpreted this paragraph, a correction has been made.

1318.43

The comment presents a general introductory paragraph and then refers to Attachment G which is a revision of the EIS Volume IV, Appendix 14, Section 14.2.2.3.G.1. The following paragraph responds to the issue raised in the introductory paragraph.

Through verification with the Electric Reliability Council of Texas (ERCOT) it was determined that 1250 MW, which constitutes Unit 1 of the South Texas Nuclear Project, went into commercial operation on 25 August 1988. EIS Volume IV, Appendix 5, Section 5.7.11.2, has been corrected in the Errata to clarify the status of South Texas Nuclear Project Unit 1.

The following paragraphs respond to issues raised in Attachment G to the Comment.

Comment paragraphs under Preconstruction, Construction and the first paragraph under Operations are consistent with those in EIS Volume IV, Appendix 14, Section 14.2.2.3.

The comment paragraph beginning with Texas Utilities TU Electric provides..." contains minor errata that have been incorporated into errata to Volume IV, Appendix 14, Section 14.2.2.3.

The next two comment paragraphs are consistent with EIS Volume IV, Appendix 14, Section 14.2.2.3.

The comment paragraph relating to generating capacity values and the current reserve capacity values have been corrected in Errata to EIS Volume IV, Appendix 14, Section 14.2.2.3. The projected reserve capacity value stated in the EIS for the year 1996 is correct. The comment refers to an ERCOT capacity margin requirement of 13 percent in this and other paragraphs. In verifications with ERCOT, the correct value is the 15-percent stated in Volume IV, Appendix 14, Section 14.2.2.3.G.1.a. The comment contains an excess reserve capacity of 224 MW while the stated 271 MW, based on the 15 percent value as stated in the EIS Volume IV, Appendix 14, Section 14.2.2.3 G.1.a, is correct.

The next comment paragraph is consistent with EIS Volume IV, Appendix 14, Section 14.2.2.3 G.1.a except for incorrectly calculated TU Electric reserve values which are included in the Errata.

The comment paragraph beginning with "The following table..." is consistent with that in EIS Volume IV, Appendix 14, Section 14.2.2.3 G.1.a. The Table titled "Texas Utilities Electric Company Reserve Margins" contains some incorrect numbers. Volume IV, Appendix 14, Section 14.2.2.3 G.1.a has been corrected in the Errata to show the correct values.

No changes were made in the EIS in response to the next two comment paragraphs. As stated previously in this response, the correct reserve capacity level is 15 percent.

The paragraph under Service Assessment for Population-Related Demands and the first paragraph under General Assessment are consistent with EIS Volume IV, Appendix 14, Sections 14.2.2.3 G.1.b and c.

The paragraph starting with "ERCOT" relates to new and retired ERCOT generating capacity. The data contained in this paragraph in the EIS have been revised as based on the North American Electric Reliability Council (NERC) Report for 1987. The data in the Errata are different than those given in the comment paragraph but agree with the cited reference (Volume IV, Appendix 14, Section 14.2.2.3 G.1.c Errata for the correct data).

The next four paragraphs are consistent with those in EIS Volume IV, Appendix 14, Section 14.2.2.3 G.1.c.

The suggested change is inconsistent with a direct quote from the North American Electric Reliability Council's (NERC) Report from 1987, and was not incorporated.

The next comment paragraph is consistent with EIS Volume IV, Appendix 14, Section 14.2.2.3 G.1.c.

The Comment to Table 14.2.2-7 correctly observes that the column titled "Projected Loads" includes "non-firm" load requirements. A revision of the table data is required. The comment note concerning the 13 percent versus the 15 percent reserve capacity level, as noted previously in this response, is incorrect. The column heading change from "Planned Reserves" to "Capacity Margin" is unwarranted and will remain as is. Changes have been included in Errata to EIS Volume IV, Appendix 14, Section 14.2.2.3 G.1, Table 14.2.2-7.

1318.44

This comment misinterprets the DEIS. The DEIS states in Volume I, page 5.1.9-3, "Few archaeological studies have been completed in Ellis County Texas." This is a statement about the general project vicinity. To date, cultural resources surveys have not been undertaken at the Texas SSC site. If the DOE selects the Texas SSC site, intensive surveys

would be undertaken to identify and evaluate prehistoric and historic archaeological sites and historic structures potentially impacted by the project.

Pertaining to paleontological resources, the EIS states on page 5.1.9-6 of Volume I that, "Little is known about the likelihood of encountering fossil remains at the proposed Tennessee and Texas sites, although occasional fossils have been located in the geological strata present at these sites."

1318.45

The Texas SHPO and the DOE have not executed a programmatic agreement. The State of Texas submitted a model for such an agreement which was neither reviewed nor approved. If the DOE selects the Texas SSC site, a Memorandum of Agreement would be developed between the DOE, the Texas SHPO, and the Advisory Council on Historic Preservation.

1318.46

Comment noted.

1318.47

Comment noted.

1319.01

Comment noted.

1319.02

As discussed in EIS Volume IV, Appendix 5, Section 5.7.2.1, flooding has been a problem in the past in both the Chambers Creek and Red Oak Creek watersheds. Flood records indicate that during a 20-yr period between 1923 and 1942, a number of destructive floods occurred in both watersheds. Since then, the Soil Conservation Service has completed construction of 72 floodwater-retarding structures in the Chambers Creek watershed, and a floodplain management program has been adopted for the Red Oak Creek watershed. Flash flooding potential will be evaluated in a Supplemental EIS and taken into account in the final design of the SSC if the Texas site is selected.

1319.03

The description of flooding patterns near the Texas SSC site (Volume IV, Appendix 5, Section 5.7.2) is intended to provide a general evaluation of current conditions in the area and serves as a basis for a comparative evaluation of potential impacts from the SSC.

1319.04

See Comment Response 1319.05 for a statistical summary of severe weather conditions that exist at the seven SSC sites on the Best Qualified List (BQL).

1319.05

Severe weather in the region of the proposed SSC site in Texas can be best characterized as tornadoes, extreme winds, and hail. EIS Volume IV, Appendix 5 of the EIS discusses severe weather at each of the seven proposed SSC sites. The table below summarizes some of the severe weather parameters of the seven proposed SSC sites:

State	Referenced in: Volume IV, Appendix 5, Section	Tornado return period	Thunder-storms per year	Hail greater than 0.75 in per year
Arizona	5.1.3	4,750 yr	27	0.08 times/yr
Colorado	5.2.3	960 yr	50	2.4 times/yr
Illinois	5.3.3	770 yr	57	0.7 times/yr
Michigan	5.4.3	1,400 yr	46	1.8 times/yr
N. Carolina	5.5.3	2,300 yr	62	0.54 times/yr
Tennessee	5.6.3	2,300 yr	77	1.7 times/yr
Texas	5.7.3	590 yr	51	3.7 times/yr

It can be seen from this table that the probability of a point at the proposed Texas SSC site being struck by a tornado corresponds to a return period of 590 years which is about a factor of eight greater than that of Arizona, for instance. Similarly, the number of times the Texas SSC site experiences hail greater than 0.75 inches in diameter is 3.7 times per year which is greater than that of any of the other six proposed SSC sites. The Texas SSC site experiences an average of 51 thunderstorms per year which is similar to several of the other proposed sites.

1319.06

The comment regarding the value of detailed weather information during SSC construction has been noted. These types of data would be used in the final design of the selected site.

1319.07

Comment noted.

As discussed in EIS Volume IV, Appendix 5, Section 5.7.2.1, flooding has been a problem in the past in both the Chambers Creek and Red Oak Creek

watersheds. Flood records indicate that during a 20-year period between 1923 and 1942, a number of destructive floods occurred in both watersheds. Since then, the Soil Conservation Service has completed construction of 72 floodwater-retarding structures in the Chambers Creek watershed and a floodplain management program has been adopted for the Red Oak Creek watershed.

1320.01

See Comment Response 35.04.

1320.02

Based on the Texas State map published by the American Automobile Association, the distance from Dallas to El Paso of Hudspeth County is about 650 mi. In EIS Volume IV, Appendix 10, Table 10.1.3-18 and Volume IV, Appendix 12, Table 12.2.3-7, 700 mi (1,120 km) is used to estimate the health impacts of transporting low-level radioactive waste from the proposed Texas SSC site to the proposed low-level radioactive waste disposal site in Hudspeth County. Volume I, Chapter 6, Section 6.2.6 has been revised to indicate that Texas is in the process of developing a low-level radioactive waste site in Hudspeth County which is about 700 miles from the proposed site.

1320.03

Comment noted.

1320.04

If Texas is the selected site, plans to mitigate wetlands impacts will be developed in consultation with appropriate agencies, such as the U.S. Army Corps of Engineers, as required by Section 404 of the Clean Water Act. The DOE will comply with Executive Order 11990 and 10 CFR 1022 regarding protection of wetlands and will avoid or minimize impacts to wetlands to the extent practicable. One possible mitigation is to move the J4 site. This and other possible mitigations are discussed in Volume I, Chapter 3, Section 3.6. Detailed, site-specific mitigation measures will be discussed in the Supplemental EIS for the selected site.

1320.05

See Comment Response 627.01.

1320.06

See Comment Responses 275.03 and 880.04.

1320.07

Comment noted.

1321.01

Comment noted.

1322.01

Comments noted.

1322.02

Comments noted.

1322.03

The DOE believes that the data analysed in the EIS is sufficient to support a siting decision. See Comment Response 13.02 on the use of recent information.

1322.04

All submitted materials were reviewed in the process of preparing the final EIS. An attempt was made to use consistent methods and level of detail across all proposed sites. This resulted in a more general discussion in some cases. Site-specific information referenced in the comment is discussed in Comment Responses 1322.06 to 1322.132. Please also see Comment Responses 7.03 and 19.01.

1322.05

Comment noted.

1322.06

See Comment Response 505.02. In addition, the decision on which wells will be abandoned will depend on the location of the wells in relation to SSC facilities as well as the depth of the wells.

1322.07

See Comment Response 1322.24.

1322.08

Estimates of population in-migration are based on reasonable assumptions applicable to all potential sites under consideration and are presented in EIS Volume IV, Appendix 14, Section 14.1.2.3.B.1.e. More detailed site-specific assumptions will be employed in the Supplemental EIS for the SSC site that is selected.

1322.09

See Comment Response 1322.163

1322.10

As noted in EIS Volume I, the Final EIS contains revisions and additions which include updated information provided by the States.

The DOE recognizes that a more detailed site-specific review will be required under NEPA prior to a final decision on the construction and operations of the proposed SSC. This more detailed review will be provided in the Supplemental EIS.

1322.11

The DEIS consisted of the summary volume (Volume I) and the information included on site selection (Volume III) as well as the Appendices (Volume IV). In the final EIS, both comments received and the DOE responses were furnished (Volume II).

While Volume I is a summary, the scope of the SSC EIS is unusually large due to the number of site alternatives to be assessed and the spatially large size of the proposed facility. The introduction to the EIS has been modified as appropriate.

The format for the EIS (Volume I) is that prescribed by CEQ guidelines (40 CFR 1500-1508).

1322.12

See Comment Response 1322.06

1322.13

See Comment Response 1322.06.

1322.14

See Comment Response 1322.06.

1322.15

Relatively little water inflow is expected at the depth of the collider tunnel and experimental halls (see EIS Volume IV, Appendix 5, Section 5.6.2.2 for a discussion of the geohydrologic characteristics of the rocks). However, as is indicated in the comment, any water-yielding fractures that are encountered in the tunnel and halls will need to be treated during construction to reduce inflow into the tunnel to acceptably low levels. This will likely be done by "pressure grouting"; a hole is drilled into the wall of the excavation so that it intercepts the weeping fracture, and cement "grout" is pumped into the hole (under high pressure) and outward along the fracture. This literally cements the fracture closed and stops it from transmitting water. In practice, the

cement impregnates only a small zone of rock immediately around the tunnel, so it does not change groundwater flow patterns in the aquifer and it does not affect yields in water wells. As noted in the comment, this procedure prevents water from flowing into the excavations and thereby being lost from the available groundwater supply.

1322.16

Assessment of the number of wells that may have to be closed at the Tennessee site was not accurately presented in the DEIS. The state estimates that only 70 or less wells will potentially have to be closed. This has been included in EIS Volume IV, Appendix 7, Section 7.2.3.6. See Comment Response 505.02. The potential for state replacement of water supplies lost due to well closure is also discussed in EIS Volume IV, Appendix 7, Section 7.2.3.6. See also Comment Response 497.02.

1322.17

See Comment Response 1322.21.

The ultimate disposal plan will be decided during final design and will be assessed in the Supplemental EIS for the selected site.

The last sentence of Section 10.2.3.6.A.2 in Volume IV, Appendix 10 has been removed.

1322.18

See Comment Response 1033.02.

1322.19

The 365 acres of land includes land required for retention ponds. Please note that Table 9.20-3, page 9.20-19, Supplementary Material, July 15, 1988, does not include land required for retention ponds.

1322.20

EIS Volume I, Section 5.1.10.3 discusses the scenic and visual impacts and in that section only the impact of the disposal of excavated material is discussed. See Volume IV, Appendix 10, Section 10.2.3.6 for the assessment of various excavated material disposal methods for Tennessee.

1322.21

The information mentioned in the letter was provided too late for inclusion in the DEIS. However, limestone could be disposed of in five commercial limestone rock quarries. The EIS is corrected to reflect this change. Please refer to EIS Volume IV, Appendix 10, Section 10.2.3.6.A.2.

Section 9.20.6, page 9.20.56 of the Tennessee proposal lists five quarries, but it is not clear whether these quarries are willing to absorb excavated material generated by the SSC project.

The sentence "the state has not identified to whom the material might be sold" has been removed from EIS Volume IV, Appendix 10, Section 10.2.3.6.A.2.

1322.22

See Comment Response 1033.02.

1322.23

Comment noted.

1322.24

The Tennessee proposal located the injector facilities in underground tunneling as the comment suggests. However, cost estimates developed for the Conceptual Design Report (CDR) were based upon the injector facilities being located near the surface in cut-and-cover construction. Redesigning the technical and conventional facilities for the Tennessee site and providing appropirate cost estimates based upon the redesign were not done for this EIS. Therefore, the concept of a cut-and-cover injector facility was adapted for the Tennessee site EIS analysis and the appropriate cost estimate was used. The impacts of cut-and-cover construction of the injector facility are felt to bound those that would be associated with underground construction. Exact location of each element of the injector facility will be decided during final design.

1322.25

See Comment Response 1322.24.

1322.26

The location of the injector facility will receive additional consideration after the site selection has been announced and a more detailed review will be provided in the Supplemental EIS.

1322.27

See Comment Response 1322.24.

1322.28

The statement that the ISP-presented injector would be implemented at the Tennessee site was intended to mean that, to enable analyses in the EIS to be made on a comparable basis for all sites, it was assumed that an injector at the Tennessee site would be located at the surface in cut-and-cover construction similar to the injector shown in the ISP.

EIS Volume I, Chapter 3, table 3-3 shows State-proposed adaptations (changes) in several major categories for each site, which are departures from the conceptual design as presented in the ISP.

The comment is noted with regard to an injector in Tennessee satisfying the separation criteria from the ISP.

1322.29

Volume I, Chapter 3, Section 3.4.6, third paragraph, second sentence has been changed to reflect that for the purpose of this analysis, all of the booster facilities were assumed to be located at the surface in cut-and-cover construction, similar to the other site alternatives.

1322.30

See Comment Response 1322.24.

1322.31

See Comment Response 1322.24. The environmental impact was assessed with the assumption that the Tennessee injector would be built using cut-and-cover construction techniques.

1322.32

See Comment Response 1322.24.

1322.33

See Comment Response 523.03.

1322.34

These data have been incorporated in EIS Volume IV, Appendix 5, Sections 5.6.1 and 5.6.2. It is agreed that placing the tunnel at the proposed depth will avoid the near-surface karst features and minimize impacts of the tunnel on the karst. See Comment Response 523.03.

1322.35

Based on the available data on water flow patterns in the Snail Shell Cave system, campus and injector area activities are unlikely to affect Snail Shell Cave. See also Comment Response 523.03.

1322.36

Based on available data on the karst hydrology of the area, surface and underground drainage from the campus and injector is toward the north, ultimately joining the west fork of Stones River. It is not clear that the proposed collection and monitoring system would provide adequate

assurance that contaminants will be prevented from entering the west fork system and thus this particular system is not proposed as a mitigation in the EIS. See also Comment Response 523.03.

1322.37

See Comment Response 509.01.

1322.38

See Comment Responses 1322.45.

1322.39

It is noted that the groundwater depth for the vicinity of the proposed Tennessee site averages from 50 to 250 ft. Available published information indicates, however, that water levels in individual wells in the area may be as shallow as 2 ft below the surface. Revisions have been made in the EIS to eliminate the typographical error (2,200 ft) and to reflect a greater maximum depth to groundwater of 250 ft.

1322.40

The Snail Shell Cave system is located immediately west of area B. The sentence referred to in EIS Volume I, Chapter 4, Section 4.2.2.1 on fracture flow has been revised to delete reference to shale sequences.

1322.41

The text in EIS Volume I, Chapter 5, Section 5.1.5.1 and Volume IV, Appendix 11, Section 11.3.6.1 has been expanded to discuss the Snail Shell Cave system in greater detail.

1322.42

Volume I, Chapter 5, Section 5.1.1.2 has been revised to reflect the possibility that shaft E7 may be relocated. This potential mitigation was identified in EIS Volume IV, Appendix 6, Section 6.3.6.2.

1322.43

Table 4-1 of Volume I, Chapter 4 has been revised. If sulfide minerals do occur in the tunnel rocks, their potential to yield a deleterious contaminant is very low, since the carbonate host rock will buffer the acidity of water passing through the spoils; this was noted in Volume IV, Appendix 6, Section 6.3.6.2.

1322.44

EIS Volume I, Section 4.6.1.1, Table 4-11 has been corrected to reflect that the values are for rock, and U-238 and Th-232 have been changed to 0.3 and 0.4 pCi/g respectively. In addition, the last sentence of the

first paragraph of EIS Volume IV, Appendix 5, Section 5.6.6.1.B has been corrected in the Errata to read, "The last core sample from the approximate tunnel level in the Murfreesboro Limestone had concentrations of 0.38 pCi/g Ra-226, 1.1 μg/g total U and 0.35 pCi/g total thorium."

1322.45

EIS Volume I, Chapter 4, Section 4.2.2.1 has been revised to say that Tennessee has a shallow karst hydrological system.

1322.46

Well yields reported in the EIS have been revised in Volume IV, Appendix 5, Section 5.6.2.2 Errata for the Ridley and Murfreesboro limestones.

1322.47

EIS Volume IV, Appendix 7, Section 7.1.3.6.F.1 has been corrected to reflect an anticipated initial inflow into the tunnel of zero to a few tens of gal/min/100 ft of tunnel (as was stated correctly in Volume IV, Appendix 7, Section 7.2.3.6.A.1). It is also important to note that this is an initial inflow rate; after weeping fractures are treated (as discussed in Comment Response 1322.15), tunnel inflow will be reduced to a negligible level.

1322.48

Comment noted.

1322.49

Comment noted.

1322.50

See Comment Response 522.11.

1322.51

Information provided by the U.S. Fish and Wildlife Service (see EIS Volume IV, Appendix 11, Attachment A) and used in preparation of the EIS indicates that both the Tennessee purple coneflower and the Indiana bat could occur in the vicinity of the proposed Tennessee SSC site. The populations of coneflower identified in the comment are reported in the EIS, and similar growing conditions may exist near the site. Recent surveys of the site suggest that summer habitat for the Indiana bat is present at or near several proposed sites for surface facilities. This information is reported in EIS Volume IV, Appendix 11, Section 11.3.5.2. The assessment of potential impacts to these two species, as well as to other listed species, is provided in Volume I, Chapter 5, Section 5.1.5.2.E. If the Tennessee site is selected, more intensive habitat

surveys to confirm the presence or absence of these species and to evaluate the effects of project development would be conducted and discussed in a Supplemental EIS.

1322.52

The text has been changed to remove any reference to the Duck River as having status as a "wild and scenic" river. Volume IV, Appendix II, Section 11.3.6.2 of the EIS addresses the potential presence of endangered fresh water mussels in the Duck River. The analysis agrees with the commenter that, because the collider ring passes under the Duck River, it is unlikely that mussel populations in this area would be adversely affected by SSC tunnel construction.

1322.53

Comment noted.

1322.54

The text has been changed to remove any reference to the Duck River as having a "wild and scenic" status.

1322.55

The word "Hoover" has been changed to "Harpeth" in EIS Volume I, Chapter 4, Table 4-16.

1322.56

The reference to cedar swamps near the Tennessee site has been deleted in EIS Volume I, Table 4-16.

1322.57

The Federally listed birdwing pearly mussel and Cumberland monkeyface pearly mussel and the candidate Tennessee cave salamander were not added to Volume I, Chapter 4, Table 4-17 because information provided by the USFWS indicated that these species are not present in the vicinity of the Tennessee site (refer to consultation letter in Attachment A to Volume IV, Appendix 11). The potential presence of these species was addressed in Volume IV, Appendix 5.

1322.58

Information on commercially, recreationally, or culturally important species in the Tennessee SSC site and vicinity has been incorporated in Volume I, Chapter 4, Section 4.7.6 of the EIS.

1322.59

The term "central Piedmont" has been revised to "Central Basin" in EIS Volume I, Chapter 5, Section 5.2.9.

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1322.60

The word "Dilphium" in EIS Volume IV, Appendix 5, Section 5.6.9.5.A.2 has been corrected to "Silphium" (see the Errata for this section).

1322.61

The scientific names Anenome caroliana and Contadilla caelata in EIS Volume IV, Appendix 5, Table 5.6.9-3 have been changed to Anenome caroliniana and Conradilla caelata respectively in the Errata for Volume IV, Appendix 5.

1322.62

The discussion on Cedar Glades in EIS Volume IV, Appendix 11, Section 11.3.6.1 has been corrected.

1322.63

The subject sentence in EIS Volume IV, Appendix 11, Section 11.3.6.2 has been revised accordingly.

1322.64

For calculating overall radiological impacts, all SSC components were treated as one entity. Radiological impacts are addressed in EIS Volume IV, Appendix 10 and Appendix 12.

There will be test beams at the SSC, but there are currently no plans for a fixed target program. If Illinois is selected as the SSC site, the fixed target program currently being conducted at Fermilab could continue because the injector would only be used by the collider for approximately one hour per day. The EIS does consider the cumulative radiological impacts of all aspects of the SSC.

1322.65

The drainage system in the collider tunnel floor is designed for the collection of water that could infiltrate the tunnel, such as seepage through the tunnel walls. Although the tunnel walls will be designed to be water-resistant, there is some possibility of seepage over time.

There will be no liquid contaminants in the collider tunnel when the SSC is operational. Furthermore, there will be no water sources in the tunnel and no radiologically contaminated water effluent. Any seepage water that is collected by the drains will be directed to sumps that will be pumped out of the tunnel when necessary. When water enters the sumps, they will be monitored for their contents prior to discharge.

1322.66

To prevent radioactivation from occurring in cooling systems, cooling water is kept to a minimum in those areas of the collider where the presence of a neutron beam could induce activation. Additionally, if tritiated water is produced in an area of the SSC, precautions are taken to assure that it is isolated from nonradioactive water sources. Closed loop cooling systems are used in beam absorbers and other systems. For example, heat exchangers will use secondary sources of cooling water, nonradioactive water, to cool components containing tritiated water, but these components are separated by double jackets or other barriers. The majority of the activation will occur in the closed loop cooling system incorporated in the main beam absorbers. Activation in the other cooling systems will be only a small fraction of that in the beam absorbers (EIS Volume IV, Appendix 10, Section 10.1.3.1.D). Any cooling water which is in an active beam area is assumed to be contaminated and will be monitored prior to disposal; if any radioactivity is found, it will be disposed of as low-level radioactive waste. Liquid radioactive waste will be solidified prior to shipment for disposal at an approved low-level radioactive waste disposal site.

1322.67

Because of the conservative design of the beam absorbers, their predicted operating life is very long--at least 25 yr but probably longer.

Repeated heating has no effect on the graphite core. Each time the beam is directed into the absorber, the temperature of the core rises to several hundred degrees centigrade, well below graphite's sublimation point of 3,652 degrees Centigrade. Because the absorber is water-cooled, it then gradually cools down to its original temperature. The absorbers are expected to be used about 500 times per year or an average of a little over once per day.

There will be very little degradation of the beam absorber construction materials. These materials are graphite, steel, titanium, and concrete. The graphite will be in pellet form to avoid thermal shock damage, and will be essentially unaffected by the thermal cycles discussed above. The steel encasing the graphite will be subjected to about a 50 degree rise during beam abort, which will have no effect on the steel.

Titanium is a refractory material and will be essentially unaffected. Enclosing everything will be concrete which will be subjected to essentially no temperature change.

The experience at other accelerators such as the Stanford Linear Accelerator and the Fermilab shows beam absorbers to be long-lived and relatively maintenance-free.

1322.68

The activation in soil/rock around the collider ring has been calculated based on a beam lifetime of 300 hours and 25 years of operation (see

Volume IV, Appendix 10). The beam lifetime of 300 hours represents the maximum loss that the superconducting magnets will tolerate before quenching. The total activity at the end of 25 years dispersed around the 53-mi ring is 4.3 ci of Na-22 and 12.2 ci of H-3. This would represent about 2×10^7 pCi of leachable Na-22 in a 20-m section and 2.8×10^9 pCi of H-3. This assumes no dilution by migration during operation of the SSC. These concentrations produced by beam gas losses are less than those calculated from a beam loss by approximately 0.8 and 30 percent, respectively. The concentrations of accelerator-produced radionuclides at a well 50-m away from a beam loss are well below EPA standards for public water supplies; the concentrations from beam gas losses would be even less (Volume IV, Appendix I2, Section 12.2.3.1.C).

1322.69

EIS Volume I, Chapter 5, Sections 5.I.6.2.A and 5.1.6.3.A have been revised to include a summary based on radiological impacts from SSC operations at the proposed tunnel depths and a summary of the radiological impacts of the SSC from an accident such as full beam loss.

1322.70

This EIS is based on the conceptual design of the SSC. Some special shielding detail was developed for the conceptual design by the Radiation Task Force. In particular, shielding at points of penetration was addressed with regard to neutron skyshine (EIS Volume IV, Appendix 10).

1322.71

In EIS Volume I, Chapter 2, Section, 2.2.4, Fermilab is referred to as the highest energy accelerator in the world. Also, the Tevatron at Fermilab has superconducting magnets and accelerates protons as well as antiprotons. The injector facility design of the SSC is similar to the existing accelerator facility at Fermilab. While not explicitly stated, it would follow that Fermilab offers a relevant basis for comparison with the proposed SSC because it is similar in design and function, and operates at energies nearest to those planned for the SSC. The energy differential between the SSC and Fermilab is discussed in Volume IV, Appendix 10, Section 10.1.3.1.D.3, with particular regard to the comparative radionuclide production of the two accelerators.

The implications of high SSC energies, with respect to radiation health and safety, are discussed further in Comment Response 996.01. These considerations provide the basis for predicting radiation doses to the public and environment. Projected radiation doses in Tennessee from direct radiation, migration of radionuclides in groundwater, and air activation products from the SSC are summarized in Comment Response 524.20.

1322.72

Radiation levels were based on calculations of absorbed doses from residue radioactivity from activated components, radiation level measurements at Fermilab and CERN, and occupational exposure data from Fermilab. Activation levels of SSC accelerator components were modeled using computer codes that are described in Volume IV, Appendix 10. A more complete description of activation and radiation levels is presented in the CDG "Report of the Task Force on Radioactivation," SSC-SR-1029, Oct. 1987. The activation level expected for various SSC components has been calculated to the desired level of accuracy--a factor of about two could be obtained. The accuracy of similar modeling efforts at Fermilab has been corroborated by actual field measurements.

1322.73

Volume I, Chapter 5, Section 5.1.6.3.A.3 and 5.1.6.2.A.4 have been revised.

The statement "...it is projected that the SSC will annually ship at most 8,000 ft^3 (220 m^3) of waste with a Ci content of 10 Ci." is correct as stated in Volume IV, Appendix 10.

1322.74

The potential impacts of a fire in the SSC tunnel during operations are discussed in Volume IV, Appendix 12, Section 12.4.2. High temperatures would not be generated in the tunnel (except possibly in the interior of a small number of magnets) even under catastrophic cooling-system failure conditions. In addition, the Safety Analysis Review (SAR) that will be prepared by the SSC operating contractor and the Supplemental EIS will address the issue of fire prevention and safety in more detail than is possible now while the SSC is still in the conceptual design phase.

1322.75

Many of the muons from the proton-proton collision will be produced at small angles with respect to the colliding beam axis and therefore will pass through the magnet structure. This will tend to disperse the muons, reducing the dose at long distances. This was not taken into account in the calculations presented in the Central Design Group's Task Force Report No. SSC-SR-1026 "SSC Environmental Radiation Shielding" from which the curves in Volume IV, Appendix 10 were derived. Furthermore, the prompt muon production model used in CASIM very likely overestimates the muon flux at high muon momentum for colliding beams at a center of mass energy of 40 TeV. For these reasons, the dose equivalent values obtained for the CASIM curves were reduced by a factor of 10.

1322.76

Volume I, Chapter 4, Section 4.6.1 has been revised accordingly.

1322.77

EIS Volume I, Chapter 4, Section 4.6.1, fourth paragraph has been revised to indicate that the use of potassium-containing fertilizers in agriculture which contain small amounts of uranium and thorium and their daughters which over time can build up. The use of agriculturally fertilized lands for housing has a potential impact on possible radon exposures.

1322.78

Volume I, Section 4.6.1, has been revised as suggested.

1322.79

Volume I, Chapter 5, Section 5.1.6.1.A has been revised as suggested.

1322.80

It is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with applicable environmental statutes, regulations, and standards, as stated in EIS Volume I, Chapter 6, Section 6.1. DOE Orders address health and safety requirements for all DOE nuclear facilities.

1322.81

Volume I, Chapter 5, Section 5.1.6.2.A.3, second paragraph has been revised as follows:

"The EPA standard for public drinking water is based on an annual dose equivalent of no more than 4 mrem from man-made radionuclides in public drinking water."

Add sentence following 0.5 pCi/ml: "If two or more radionuclides are present, the sum of their annual dose equivalents shall not exceed 4 mrem."

The last three sentences which refer to single limits and not to the sum of fractions have been deleted.

1322.82

Periodically, the water in the closed loop cooling system of the beam absorbers will need to be replaced to maintain tritium in the water at acceptable levels. The planned treatment and disposal method for the tritiated water is to take advantage of water's wetting agent properties and to solidify the radioactive component in a matrix such as concrete. New solidification technologies are emerging in this area, and the method to be employed at the SSC will be selected when the wastes are generated. Solidified wastes with tritium will be disposed at a low-level radiological waste (LLRW) facility. For planning purposes and

impact assessment, it was assumed that the low-level wastes would be disposed at the DOE's Hanford facility in Richland, Washington (EIS Volume IV, Appendix 10, Section 10.1.3.1). Another option to be considered by DOE is disposal of the low-level wastes at a regional compact facility, if the states are willing to accept the wastes, and if there are cost savings to the Federal government.

1322.83

The subject sentence has been revised. The statement that only Colorado has the authority to regulate mixed wastes has been deleted.

1322.84

EIS Volume I, Chapter 6 has been revised to indicate that the EPA has determined that wastes containing both hazardous waste and radioactive waste components, i.e., mixed wastes, are subject to RCRA regulations (51 FR 24504). Regulated hazardous waste generated by any of the proposed activities would be treated, stored, and disposed of in accordance with applicable federal and state requirements.

The low-level radioactive wastes would be disposed of in solid form consistent with the provisions in DOE Order 5820.2A or 10 CFR 61 as applicable. Texas is in the process of developing a low-level radioactive waste site in Hudspeth County which is about 700 mi from the proposed site. Colorado, North Carolina, and Tennessee are in regional Low-Level Radioactive Waste Compacts which have access to existing commercial low-level radioactive waste disposal sites. These sites may accept SSC wastes. Although mixed wastes are not expected to be generated, if they are, the wastes will be managed in accordance with applicable NRC radioactive waste and EPA hazardous waste regulations.

1322.85

EIS Volume IV, Appendix 5, Section 5.6.6.1.D has been changed from "These samples may or may not be representative of the radioactivity expected at the site" to read "While these samples are limited, the results are expected to be representative."

1322.86

EIS Volume IV, Appendix 5, Section 5.6.6.2 has been corrected in the Errata to include those changes suggested in this comment.

1322.87

A similar statement is made for each of the site alternatives to indicate no commercial low-level radioactive/mixed waste disposal facility is available. (EIS Volume IV, Appendix 5, Sections 5.1.8.4, 5.2.8.4, 5.3.8.4, 5.4.8.4, 5.5.8.4, 5.6.8.4, and 5.7.8.4). Because none of these low-level waste compact sites is operational at this time, they were not considered as part of the existing environment in Volume IV, Appendix 5.

Waste disposal options are addressed in Volume IV, Appendix 10, Section 10.1.3.1. In Volume IV, Appendix 10, Table 10.1.3-16 it is summarized that Tennessee has access to the Southeast Low-Level Waste Compact regional disposal site.

1322.88

The DOE is currently operating approximately 15 low-level radioactive waste disposal facilities in the United States. For this assessment, the health impacts were based on disposal at the DOE facility at Richland, Washington, as is the current practice at Fermilab. Disposal of wastes at a state and/or NRC licensed commercial low-level radioactive waste facility will be considered if there exists a willingness by the state(s) to accept the waste and the economic incentive. (See EIS Volume IV, Appendix 10, Section 10.1.3.1). The decision to utilize a regional disposal facility is also predicated on availability of adequate regional compact disposal capacity and a decision by the DOE that to use a regional disposal facility would represent a cost saving to the public. The DOE will select a low-level radioactive waste disposal option once the site selection process has been completed and the waste disposal options for the specific site have been thoroughly evaluated.

1322.89

EIS Volume IV, Appendix 10, Section 10.1.3.1.D.3.d has been corrected in the Errata to reflect that disposal at a regional compact low-level waste disposal facility licensed by a State and/or NRC remains a possible option, except in Michigan, which has passed legislation prohibiting the disposal of SSC-generated LLRW.

EIS Appendix 10, Section 10.1.3.1.D.4.a has been corrected in the Errata to reflect that any mixed waste produced by the SSC would be subject to and managed in accordance with applicable regulations of the Resource Conservation and Recovery Act (RCRA).

1322.90

The conflicting statements referred to in the comment have been corrected in the Errata for Volume IV, Appendix 12. The health hazard assessments are based on an annual dose equivalent compared to the EPA standard of 4 mrem (Volume IV, Appendix 12, Section 12.4.1.1).

1322.91

Information on this subject was presented in three separate places in the DEIS (see Volume I, Chapter 4, Section 4.4.2; Chapter 5, Section 5.1.3.2; and Volume IV, Appendix 8, Section 8.3.4). Nashville data was utilized because no other data was found to exist. To help ensure that a misunderstanding does not occur, a qualifier for carbon monoxide will be added as a footnote in the EIS, in the sections noted above. Please refer to Comment Responses 1322.96, 1322.98, and 1322.108.

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1322.93

Qualifying statements or footnotes have been added in the text wherever nonattainment areas in Tennessee are mentioned. See Comment References 1278.11, 1322.96, 1322.98, and 1322.108.

1322.94

The bullet discussing air quality in Volume I, Chapter 3, has been expanded as suggested.

1322.95

The reference should have been to Volume I, Chapter 5, Section 5.1.3.2, rather than Volume IV, Appendix 8. The EIS has been revised.

1322.96

EIS Volume I, Section 4.4.2, Table 4-6 has a footnote added to indicate that the only ambient carbon monoxide data available was that associated with sampling in downtown Detroit, Durham, and Nashville. There is no reason to believe these numbers are representative of conditions at the proposed sites. They were used because they were the only quantitative data located and probably represent hypothetical worst-case scenarios that are overly conservative in nature. It is not believed that the carbon monoxide NAAQS are or will be exceeded at any of the sites.

1322.97

Correct. The sentence has been revised accordingly.

1322.98

The wording in the referenced text is misleading; it has been revised in the Final EIS.

1322.99

The quoted term "unavoidable adverse impacts" with respect to particulate matter does not occur on either of the referenced pages. However, it is discussed in Volume I, Chapter 5, Section 5.4. After application of mitigation measures there will be no significant adverse impact. The reference to TSP NAAQS exceedance has been deleted from Section 5.4.

See Comment Response 1278.11.

130113503358839

1322.100

See Comment Responses 1278.11 and 1278.13.

1322.101

The statement referred to in the comment has been deleted.

1322.102

The name of the area referred to in EIS Volume IV, Appendix 5, Section 5.6.4.2 should indeed be Mammoth Cave National Park rather than Sipsey Wilderness. The error has been corrected in the Errata to Appendix 5.

1322.103

While it is true that PM_{10} standards have replaced TSP standards, the DOE has chosen to include both in the EIS. The rationale is that currently there is very little historical PM_{10} data available as compared to TSP data. Also, many of the states still have TSP ambient air quality standards. A better comparison for impact analysis can be made if both TSP and PM_{10} are used.

The reference to hydrocarbon (HC) in Section 8.1, second paragraph, of Appendix 8 will be modified as follows:

.....carbon monoxide (CO), hydrocarbon (HC)(as a precursor of ozone), sulfur dioxide (SO_2).....

1322.104

The referenced sentence was a discussion of the consequences of the emissions, i.e., an air quality impact analysis. Neither the CAA nor any SIP (including Tennessee) requires an air quality impact analysis for SSC construction emissions. The analysis results were presented to insure that the information was available to DOE and other public officials and citizens before decisions are made on the SSC as required by NEPA.

The statement was not intended to imply that no State-level permits would be required. The fact that local permits may be required is acknowledged in EIS Volume IV, Appendix 8, Section 8.3.1.2.C.

1322.105

The activities listed in EIS Volume IV, Appendix 8, Section 8.3.1.1 with potentially significant environmental consequences were not intended to be all inclusive. Both concrete and asphalt batch plants were included in the construction emissions inventory. Emissions, during construction, from fuel storage tanks were not specifically quantified in the EIS because they should not be significant (Volume IV, Appendix 8, Section 8.3.1.2).

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1322.106

See Comment Response 1278.11.

1322.107

See Comment Response 1278.11.

1322.108

Volume IV, Appendix 8, Section 8.3.4 of the DEIS has been rewritten for the FEIS in accordance with other comment responses to eliminate any confusion that SSC-related emissions would either cause or contribute to a carbon monoxide ambient air quality standard exceedance.

1322.109

See Comment Response 1278.11.

1322.110

The basis for the 47-percent conversion of total suspended particulate (TSP) to PM_{10} is referenced in EIS Volume IV, Appendix 8, Section 8.3.1. Particle size multipliers were used for particulates less than 30 micrometers in diameter (TSP) and particulates less than 10 micrometers in diameter (PM_{10}) for fugitive dust from unpaved roads. The 47-percent figure is the ratio of the two particle size multipliers.

1322.111

Comment noted.

1322.112

This change has been incorporated into EIS Volume I, Chapter 4, Table 4-5.

1322.113

See Comment Response 428.21.

1322.114

The cited sentence has been corrected in the Errata for Volume IV, Appendix 5 to state that elevation plays a minor role in determining temperature conditions.

Incorporation of the cited reference was done in the Errata.

1322.115

See EIS Volume IV, Appendix 5, Section 5.6.3.2. The minimum temperature drops below freezing on the average of 74 days per year.

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1322.116

The EIS has been revised to include a reevaluation of wetlands at the proposed Tennessee SSC site (see Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.6.3). This new wetlands assessment is based on information obtained during field surveys at the site and from U.S. Fish and Wildlife Service National Wetlands Inventory Maps.

1322.117

See Comment Response 522.24.

1322.118

Should Tennessee be selected as the site for the SSC, siting of spoils piles and detailed mitigation measures for the handling and disposition of spoils would be prepared during the design phase, and evaluated in the Supplemental EIS.

1322.119

This comment summarizes numerous following comments included in the same letter. Refer to the responses to those later comments (1322 120 through 1322.136). Changes have been made where appropriate.

1322.120

There were mathematical errors in Bedford, Marshall, and Rutherford Counties property tax losses -- instead of annual losses of $1.1, $0.5, and $1.4 million, in each of the counties, respectively, as published in DEIS Volume IV, Appendix 14, Section 14.1.3.6.D, the loss should be $0.1 million each year in each county (rounded from $105,000 in Bedford County, $51,563 in Marshall County, and $137,813 in Rutherford County). Corrections are included in the Errata for EIS Volume 14, Appendix 14, Section 14.1.3.6.D.

1322.121

See Comment Response 1322.120.

1322.122

The Tennessee proposal estimated that $75 million of privately-owned real property would need to be transferred to Federal ownership to site the SSC. The EIS, in the absence of any information concerning land values in specific counties, assumed that land values would be roughly equivalent in each of the three counties. Therefore, in Volume IV, Appendix 14, the EIS divided the $75 million market value among the three counties according to the amount of land area affected in each county as a percent of the total amount of land area affected in

Tennessee. The results are illustrated below (dollar values are presented in millions):

	Bedford Co.	Marshall Co.	Rutherford Co.
Percent of Affected Acreage in County *	25%	12.5%	37.5%
Market Value of Real Property in County	$18.8	$9.4	$28.1

* The remaining 25 percent of the total land area of Tennessee's proposed SSC site is located in Williamson County (not considered a primary impact county in the EIS analysis).

1322.123

The correction factors shown in the comment reduce the estimates of property tax losses by more than 50 percent in Marshall County. However, as noted in Comment Responses 1322.120 and 1322.122, the major differences between the estimates of loss presented by the commenter and those in the EIS originate out of different market value estimates for Bedford and Marshall Counties. The corrected EIS estimates in the Errata are not substantially different. Estimates are purposely reported in the EIS in tenths of millions of dollars ($0.0 millions) to reflect the level of accuracy that was associated with them. Any disagreement in the EIS public finance assessment beyond this level of detail is not considered significant.

1322.124

The EIS methodology correlates increased capital infrastructure expenses with increased growth rates based on information from the President's Economic Adjustment Committee, 1981 (see EIS Volume IV, Appendix 14, Section 14.1.2.3.A.4). Bedford County is expected to receive an SSC-related population increase of 374 by 1991. Local jurisdictions in the county would incur expenses to accommodate this growth during the first 3 years of construction. In the following years, jurisdictions in the county are projected to receive a net fiscal benefit from SSC construction and operations. More detail regarding the fiscal impact analysis is provided in EIS Volume IV, Appendix 14, Section 14.1.3.6.D. The EIS methodology was unable to incorporate existing capacity levels for each jurisdiction in all of the 16 primary impact counties in the seven regions under study. If the Tennessee site is selected by the DOE as the final SSC site, a supplemental EIS would analyze this issue in greater detail.

The EIS presentation was aimed at illustrating the cumulative "net impact" to local governments on an annual basis. The results shown in the tables referred to by the commenter should not be mistaken for "net fiscal deficits" or "surpluses". It is possible, as stated in the EIS,

that large amounts of capital improvements would be financed by local jurisdictions, but the terms of such arrangements can vary drastically depending on the market for bonds, the amount to be financed, the loan period, the rating of the local jurisdiction, and other factors.

1322.125

As indicated in the EIS, the indirect tax revenue estimate for local government public finances, "... assumed that net revenues for local government jurisdictions would increase in the same proportion as earnings levels from SSC direct jobs to baseline earnings" (Volume IV, Appendix 14, Section 14.1.2.3.A.4). The commenter incorrectly attempts to replicate the results of the EIS using the total population change in each of the primary impact counties. The EIS results do not use the population change, but the number of SSC direct workers, since it is the greater-than-average income of these workers which is assumed to spur additional tax revenues. In trying to replicate the results, the commenter also neglects inclusion of additional per capita income which would accrue for city and other government jurisdictions. A display of the calculations used in the estimation of indirect tax revenue (for the peak year of construction, 1992) is shown below to illustrate the process:

	Bedford Co.	Marshall Co.	Rutherford Co.
Additional per capita revenue from greater than average SSC earnings per job ($88)			
County Govt.	$416	$435	$292
City of Chapel Hill	N/A	$79	N/A
City of Murfreesboro	N/A	N/A	$325
Other Govt. Juris.	$99	$113	$4
Number of direct SSC workers in 1992			
County	99	22	1,850
City of Chapel Hill	N/A	2	N/A
City of Murfreesboro	N/A	N/A	1,193
Average worker household size	2.91	2.91	2.91
Indirect tax revenue in 1992 ($88 million)			
County Govt.	$0.1	$0.0	$1.5
City of Chapel Hill	N/A	$0.0	N/A
City of Murfreesboro	N/A	N/A	$1.1
Other Govt. Juris.	$0.0	$0.0	$0.0
Total	$0.1	$0.0	$2.7

1322.126

The referenced case estimate of in-migration in the Tennessee Region of Influence (ROI) is nearly the same as the high scenario estimate for 1992, though the high scenario was not used. Reference case estimates for the Tennessee ROI are presented in EIS Volume IV, Appendix 14, Section 14.1.3.6.B.1 (see also Errata for that Section). The reference case assumptions are stated in EIS Volume IV, Appendix 14, Section 14.1.2.3.B (see also Errata for that Section).

As stated in the EIS, three factors were considered to explain the differences in in-migration among site alternatives: the relative sizes of the baseline labor force in each ROI, the relative unemployment rates in each ROI, and the relative level of education for the adult population in each ROI. Also as stated in the EIS, these three factors were applied to different categories of jobs in different ways. For example, education levels were a key factor in determining the level of in-migrating direct technical workers; unemployment rates were a key factor in determining the level of in-migration for the SSC construction workforce and for clerical workers; and both education levels and the size of each ROI's labor force were used to estimate the number of in-migrating managers, physicists, and other professional workers.

Several other factors also could affect in-migration into an ROI, including the quality of public services (e.g., schools), weather, and the availability of affordable housing. All factors incorporated in the EIS and these additional factors help to explain in-migration and choice of residence. Even if an objective and accurate method of measuring each of the additional factors could be made in each ROI, it would be difficult to determine the relative weights given to weather versus affordable housing versus the quality of public services versus other factors. By incorporating the size of each ROI's labor force into the equation, the EIS methodology indirectly includes various other factors, since the relative size of each ROI's labor force indicates a measure of the choice of residence made by thousands of people who may have considered all of these factors.

1322.127

See Comment Response 1322.126.

1322.128

Although the Saturn project may in fact contribute to decrease the unemployment rate slightly within the Region of Influence (ROI), the EIS does not make this claim. Except for the 1981-1983 period, the Tennessee ROI has had lower unemployment rates than the national average since 1970. Only if SSC construction were to begin in a reasonably short time (within a few months) following completion of Saturn plant construction, currently scheduled for the summer of 1990, would the comment's statement be correct: "the SSC would ... provide continued employment for the workers already located in the ROI."

1322.129

Existing available employment opportunities for family members of in-migrating workers would be available in addition to direct and indirect employment impacts of the SSC. To the extent that such family members take these existing jobs, they would not be likely to fill SSC-related jobs (see EIS Volume IV, Appendix 14, Section 14.1.3.6).

1322.130

The generalized methodology used in EIS Volume IV, Appendix 14, Section 14.1.2.3 is designed to prevent inappropriate comparisons among sites. Consideration must be given to the fact that the Tennessee Region of Influence (ROI) has the smallest labor force among the seven proposed sites, more than 25 percent less than the next in size, the North Carolina ROI, and less than one-fifth of the Illinois ROI labor force. This factor alone justifies estimates of in-migrating labor to the Tennessee region to be among the highest of the seven sites. Tennessee also had the second-lowest unemployment rate of the seven sites in 1987, which combined with the labor force data indicates that the Tennessee ROI has an available unemployed labor force less than one-seventh the size of the available unemployed labor force in the Illinois ROI and less than one-fifth the size of the unemployed labor force in the Michigan ROI.

1322.131

Shelbyville is small compared to Nashville, Franklin, and even Murfreesboro. The conclusions (see EIS Volume IV, Appendix 5, Section 5.6.11) concerning lifestyle effects are tentative, as characterized by the words "could be" in the EIS passage quoted in the comment.

1322.132

This comment appears to refer to the passage "The growth in population projected for 1992 as a consequence of the SSC would generate an increase in housing demand for an estimated 4,000 year-round units; by the year 2000, an additional 3,000 units would be required .... " (EIS Volume IV, Appendix 14, Section 14.1.3.6.B), and to Table 14.1.3.6-6 in the same section of the EIS. Housing impacts for the Tennessee Region of Influence, as well as for the primary impact counties of Bedford, Marshall, and Rutherford, are calculated as the number of year-round units required to house project-related in-migrants in a given year for the area in question. The numbers are not cumulative, as correctly interpreted in the comment, but rather are calculated as the total number of units needed in a given year. Thus a situation where fewer total units might be required in one year than in another, later year indeed is possible. Similarly possible is the scenario proposed in the comment in which units inhabited during construction will be released to operations-related staff as construction ends and operations begin.

1322.133

As stated in the comment, the evaluation of housing impacts at the county level is based upon the number of SSC-related in-migrants placed in a particular county by the spatial allocation model (see EIS Volume IV, Appendix 14, Section 14.1.3.6.B). Allocation in this context refers to the place where in-migrants would generate housing demands. Thus, the problem central to the comment is not so much with the housing impact evaluation as with the logical interaction between the spatial allocation methodology and housing demand.

In-migration and housing availability are variables that interact in a setting such as that evaluated in the EIS: people can in-migrate to an area, and generate housing demand; or housing availability can be one of the characteristics of an area that attracts population. Conceptually, this would take the form of a cycle, where increased housing demand would generate additional housing, which in turn would attract more people to an area, generating still more demand for housing, and so on. The beginning of this cycle (that is, housing availability or demand) is uncertain. Analytically, the EIS enters the cycle with the allocation of people -- the generation of a basis for housing demand.

One of the variables considered by the spatial allocation model is the population of potential locations for in-migrants (EIS Volume IV, Appendix 14, Section 14.1.2). Places with larger populations will frequently (though not always) contain more housing units; thus by incorporating population, the model indirectly accounts for housing availability in different places. Ultimately, the analysis conducted in the EIS provides a prediction that is considered reasonable for use in the site selection process. The spatial allocation model does not allow for locational adjustments based upon housing availability, and could indeed under predict in-migration to certain areas with abundant housing.

1322.134

Methods for projecting baseline employment in the EIS were selected because they are more closely related to the impact analysis methodology than other methods (see EIS Volume I, Chapter 4, Section 4.9.1). The reasonableness of these projections, as stated in the comment, is acknowledged. Baseline regional employment/population ratios are not used in the analysis.

1322.135

The commenter's statement concerning the reasonableness of secondary employment projections is acknowledged. To the extent that tertiary sector impacts occur after a time lag not incorporated in the analysis, the peak year of employment could be delayed somewhat, but the magnitude of these impacts would remain the same.

1322.136

Baseline total population of each county was used to estimate the distribution of indirect and induced SSC-related in-migrant workers (EIS Appendix 14, Section 14.1.2.3.B.2.b). As a result, about 42 percent of these workers are estimated to seek residence in Davidson County, about 8 percent in Rutherford County, and about 6 percent in Williamson County (Volume IV, Appendix 14, Section 14.1.3.6.B).

1322.137

The cited pamphlet is of use in informing affected individuals of the compensation plan. See also Comment Responses 710.01 and 880.04.

1322.138

See Comment Response 1322.137.

1322.139

See Comment Response 880.04.

1322.140

All materials submitted were reviewed by the DOE in the preparation of the FEIS, including Socioeconomics (see Volume IV, Appendix 14). See also Comment Responses 1322.120, 1322.122, and 1322.123.

1322.141

The comment correctly reflects the mileages of road improvements given in the EIS, correctly identifies the original Tennessee proposal as the source of this information, and also correctly references the pertinent locations in the EIS, except DEIS Volume IV, Appendix 4, Table 4-3, "Comparison of Groundwater Resource Characteristics" does not list miles of road improvements.

1322.142

Comment noted. The recently completed, refined road improvement plan described in the comment cannot be considered in this EIS because the ISP (Section 3) provides for accepting only additional information requested by the DOE. If the Tennessee site is selected, it may be considered in the Supplemental EIS.

1322.143

See Comment Response 508.01.

1322.144

See Comment Response 508.01.

1322.145

This EIS assesses a conceptual design layout specified in the Invitation for Site Proposals and contained in the original Tennessee proposal. This allows for a common basis for comparison of impacts among the site alternatives. For the selected site, site-specific design alternatives such as the one suggested here by the State of Tennessee will be assessed in the Supplemental EIS.

1322.146

The comment is considered a modification of the Tennessee proposal. The EIS analysis uses a baseline of proposal data and supplemental data as of March 31, 1988. It is assumed that the comment is intended to minimize impacts. The current EIS analysis sets an upper bound for impacts. This approach is to assure comparable and consistent treatment to all proposers. Should Tennessee be selected as the site for the SSC, site-specific mitigations will be addressed in the Supplemental EIS (see EIS Volume I, Chapter 3, Section 3.6).

1322.147

See Comment Response 1322.146.

1322.148

Water use increases in Tennessee from both construction and operations of the SSC are discussed in Volume IV, Appendix 7, Section 7.1.3.6.G of the EIS. The Consolidated Utility District of Rutherford County is identified as the primary source of water for the construction and operations phases of the SSC. The majority of off-site domestic water use increases are expected to occur in Davidson County, and it is assumed that the Nashville Water Supply System would provide this water.

1322.149

The evaluation of water use increases in Tennessee (EIS Volume IV, Appendix 7, Section 7.1.3.6.G) concludes that the impacts caused by the SSC project should be negligible, assuming that the water use would be distributed over several water supply systems. However, if water use is concentrated on individual systems, the increased demand could hasten system expansions. The Murfreesboro Consolidated Utility District and Bedford County Utility District water supply systems could experience this pressure.

1322.150

See Comment Response 1361.06.

1322.151

See Comment Response 1361.06.

1322.152

Volume I, Chapter 3, Section 3.4.6 has been revised to properly cite the names of the utility districts providing water service in the vicinity of the proposed site.

1322.153

The purpose of Table 3-7 in Volume I, Chapter 3 of the EIS is to provide an overview of SSC-related impacts. The various impacts outlined are discussed in detail in subsequent sections of the document. As stated in Volume IV, Appendix 7, Section 7.1.2.G.1, impacts to water use were assessed by comparing potential increased water supply requirements with existing community water use, the existing system's capacity, and its planned capacity. As this point is stated and clarified here, it would seem unnecessary, for the purpose intended, to change the wording in the Table.

1322.154

See Comment Response 1322.155.

1322.155

The text of EIS Volume I, Chapter 5, Table 5.6-4 has been modified to reflect the discussion of potential groundwater impacts in EIS Volume IV, Appendix 7, Section 7.2.3.6.

1322.156

The water supplied by the public utilities in the Tennessee site area will be of suitable quality for construction, domestic, and other general use. But its suitability for boiler use will be further evaluated if the Tennessee site is selected. The text in EIS Volume IV, Appendix 1, Section 1.2.6.11 has been revised for clarification (see Errata to Appendix 1).

1322.157

This observation is consistent with that in EIS Volume IV, Appendix 10, Section 10.3.3.2.F and 10.2.3.6.A.

1322.158

The original proposal mentioned that paper could be source separated and recycled. EIS Volume IV, Appendix 10, Section 10.3.3 has been thus revised.

1322.159

The comment is considered a modification of the Tennessee proposal. The EIS analysis is based on a baseline of proposal data and supplemental data as of March 31, 1988. It is assumed that the comment is intended

to minimize impacts and that the current EIS analysis sets an upper limit for impacts. This approach is to assure comparable and consistent treatment to all proposers. Should Tennessee be selected as the site, site-specific mitigations will be addressed in the Supplemental EIS.

In regard to permits, it is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with applicable environmental statutes, regulations, and standards.

1322.160

The discussion of TVA facilities in the EIS applies only to the DOE's NEPA review of the SSC project. Should the Tennessee SSC site be selected, TVA would need to complete a NEPA review of any electrical facilities constructed or operated by TVA to serve the SSC.

1322.161

See Comment Response 1322.163

1322.162

Figure 3-5 in Volume I, Chapter 3 of the EIS shows a Service Area Perspective. These service areas occur at the F sites around the main ring. The two transformer locations shown are not the two main sources of power for the SSC project. These are located at the main campus area and at the far cluster.

In addition, the figure is based on the site-independent conceptual design and does not account for any differences from site to site.

1322.163

The EIS, Volume I, Chapter 5, Section 5.1.8.7, states that "Tennessee also would require construction of a fairly substantial amount of line." The statement is true in that 32 mi of new power line are required to serve the SSC substations, as shown in the EIS Volume I, Chapter 3, Table 3-3. The construction of the power lines will cause environmental impacts whether or not a new route is selected or existing or new poles are used in an existing right-of-way. However, it is acknowledged that the use of an existing right-of-way would result in fewer impacts than the clearing of a new right-of-way.

This EIS is based on the proposal submitted by the State of Tennessee and the site-independent conceptual design. Neither the technical feasibility nor economics of power line routing have been studied in detail. Therefore, it was assumed in the EIS that new transmission lines would be constructed in new right-of-way.

Routing of the power lines, including the use of existing rights-of-way and existing facilities will be studied further during detail design. The impacts of constructing transmission lines and other utilities will

be addressed in greater detail in the Supplemental EIS for the selected site. In addition, should the Tennessee site be selected as the site for the SSC, the DOE anticipates that TVA would need to compute a NEPA review for its role in the actual siting and construction of a new transmission line.

1322.164

See Comment Response 1322.136.

1322.165

Receipt of the subject report is acknowledged; the information will be considered with respect to site-specific project design and in the Supplemental EIS if the Tennessee site is the selected site.

1323.01

See EIS Volume I, Chapter 2, for a discussion of the purpose and need for the SSC project.

1324.01

In reference to the greater number of people in Illinois that would be affected by the SSC project, Volume I, Chapter 3, Table 3-6 of the EIS shows that 3,305 parcels of land will be affected by the project. Although this number is greater than any one of the other states, this does not necessarily mean that the greatest number of relocations would occur. Relocation needs in Illinois are set at 219 (compared to 221 in Michigan, 180 in North Carolina, 128 in Tennessee, 6 in Arizona, 175 in Texas, and 23 in Colorado). Thus Michigan has the highest number of projected relocations.

1324.02

Comment noted. However, the DOE is not responsible for the activities of State agencies or officials. See Comment Response 1126.05.

1324.03

Comment noted. However, the DOE is not responsible for the activities of State agencies or officals. See Comment Response 1126.05.

1325.01

The discussion of the impacts of the SSC project on jobs is in the EIS Volume II, Chapter 5, Section 5.1.8.1. The discussion on the impacts on public finance is in Volume I, Chapter 5, Section 5.1.8.3.

1326.01

Comment noted.

1327.01

Comment noted.

1328.01

The total employment for the Michigan Region of Influence for 1984 was 2.1 million, with 22.7 percent employed by the manufacturing industry, 0.2 percent by the mining industry, 2.8 percent by the construction industry, and 25.8 percent by the services sector (EIS Volume IV, Appendix 5, Section 5.4.11). Many of the trained machinists and skilled workers needed for construction and operations of the SSC would likely come from these four industrial groups. See also Comment Response 816.01.

1329.01

Comments noted.

1330.01

All factors mentioned in this comment are addressed in the EIS, and their potential impacts are assessed for all candidate sites. The relative magnitude of these impacts, together with other factors, will be considered in selecting the site. See Comment Responses 7.03 (potential well closures) and 1007.02 (floodplain aspects). The existing traffic and the impact of SSC traffic are discussed in EIS Volume IV, Appendix 14, Section 14.2.1.3.C. Land acquisition and relocations are discussed in Volume IV, Appendix 4.

1330.02

A general decline in water levels in the vicinity of the proposed Illinois site has occurred since the early 1900's as suggested in the comment. This trend is described in EIS Volume IV, Appendix 5, Section 5.3.2.2. It is noted that 900 ft is the maximum decline observed and has only occurred in areas to the east of the proposed SSC site nearer to Chicago.

As noted in the comment, a moderate amount of blasting will occur for shaft construction and initial tunnel excavation (due to the tunnel boring machine assembly). Blasting would only affect wells in the very immediate vicinity of the blast site. Most of these wells would have to be abandoned because of their location within a fee simple area for the SSC. The State has indicated that compensation would be provided to owners of wells which must be abandoned or those damaged in the form of a replacement well or a supply of water from an alternative source of equal or better quality. The mechanism of this compensation is up to

the States and will be defined in the Supplemental EIS to be prepared for the selected site.

Any significant groundwater inflows encountered during tunnel construction will be controlled by grouting or other appropriate measures. Minimal if any water level effects from uncontrolled inflows are anticipated.

1330.03

Potential effects of the SSC tunnel on groundwater quality during construction and operations at the Illinois site are discussed in EIS Volume IV, Appendix 7, Section 7.2.3.3.

1330.04

The findings of the EIS do not indicate that there will be any significant long-term effects to the public from radiation or magnetic fields associated with the construction and operations of the SSC (see EIS Volume I, Chapter 5, Section 5.1.6 and Volume IV, Appendix 12). All calculations show that any radiation contribution to the public environment from operations of the SSC will be well below the background radiation levels already present in the environment at the Illinois site. Also, there is only inconclusive evidence at this time to support the theory that electromagnetic fields from electric power lines pose a threat to human health. See Comment Response 733.02.

1330.05

Comment noted.

1331.01

Comment noted.

1331.02

The text has been revised in accordance with the comment. See Comment Response 716.05.

1331.03

The map has been corrected in response to the comment.

1331.04

The text of DEIS Volume I, Chapter 3, Section 3.7.3 has been revised in response to the comment. See EIS, Volume I, Chapter 5, Section 3.7.3.

1331.05

The estimated population increase due to the SSC project reflects a conservative estimate. The analysis utilized a broad range of factors that

would influence work force in-migration due to the SSC, including: the regions labor force, recent unemployment rates, and adult education levels. The approach taken is presented in EIS Volume IV, Appendix 14, Section 14.1.2.3. The existing resident work force, including those workers residing in Wake County, would fill the remaining SSC-related jobs.

The analysis of population increases and in-migration was not directly evaluated in terms of impact per se, but rather as the cause of impacts in other areas of concern--such as public services and housing. As such, the analysis reflects a conservative estimate of population impacts due to the SSC in the Region of Influence (ROI). Conservative assumptions are used in the analysis of impacts in order not to underestimate the magnitude of potential impacts. The allocation of the population increase to counties within the ROI reflects assumptions concerning the travel time to work as well as housing availability in the region.

Generally, the greater the labor availability in the region within a reasonable commuting distance to the project and the greater the mix of labor skills available locally compared to that needed for the SSC, the lower the in-migration and resulting population increase due to the SSC project. Labor availability within the ROI but beyond a reasonable commuting distance may result in temporary work-week in-migration, where the workers reside in the local area during the work week and return home on weekends and/or days off. This would result in a similar demand on public services as would an increase in the population in general.

The Little River Reservoir completed in early 1988 has been included in the revised water supply assessment in the EIS (Volume I, Chapter 1, Table 1-1; Chapter 3, Table 3-7; Chapter 5, Section 5.1.2.4; and Volume IV, Appendix 7, Section 7.1.3.5.G). The assessment indicates a negligible impact that water requirements for the SSC project and additional off-site domestic use can be met by existing reservoirs in the project vicinity, which have adequate excess capacities.

See also comment responses 0799.02 and 0799.03.

1331.06

The capacity of the Eno Wastewater Treatment Plant was expanded from 1.5 to 2.5 million gal/d in 1987 and is planned for expansion to 10 million gal/d (Errata for EIS Volume IV, Appendix 5, Section 5.5.8.1). It is not certain that the expansion will be completed in time or whether the expanded capacity will be available to the SSC project. However, utilization of existing sewage treatment plants in Durham and other municipalities is only one of the alternatives considered in the EIS. If treatment capacity of existing plants is not adequate to support the SSC, package treatment plants with final disposal by land application could be used. Further detailed discussion of available alternatives is presented in EIS Volume IV, Appendix 7, Section 7.1.3.5.F.

1331.07

Volume I, Chapter 3, Section 3.1.4 of the EIS is revised to reflect the information given in the North Carolina proposal; namely, that the high energy booster at the North Carolina site could be constructed through unweathered crystalline rock and that the booster tunnel can be constructed with a TBM.

1331.08

The geotechnical information provided by the State was verified by site visits and drill core inspections by EIS preparers with geotechnical expertise. Indications are that a maximum of unweathered rock above the roof of the halls was 29 ft for area K1 and 14 ft for area K6. This does not appear to be sufficient for structural support of the roof system for halls with clear spans of approximately 80 ft. Therefore, the more conservative cut-and-cover construction method was assumed for these two halls for EIS purposes.

After selection of a site for the SSC, further geotechnical studies and engineering detail design with consideration of environmental as well as cost impacts will determine the actual placement and the method of construction for the experimental halls. Additional details will be provided in the Supplemental EIS.

1331.09

See Comment Response 800.06.

1331.10

The study cited in the comment ("The Expected Economic Impacts and Net Revenue Benefits of Locating the Superconducting Super Collider in North Carolina" by J.E. Connaughton and R.A. Madsen, Center for Business and Economic Research, University of North Carolina at Charlotte, September 1988) has been added to the list of references used in preparing this EIS. The Study focuses on the distribution of existing construction labor in the North Carolina region. On page 10 of that report, however, it is noted that "some in-migration from other labor markets" would result. Moreover, on page 47 of that report it is noted that the "substantial economic impact will translate in new household formations in each county." No quantification of levels of in-migration was reported. The number and distribution of in-migrating workers, not the distribution of existing labor, are the most important factors influencing socioeconomic impacts of the SSC (see Comment Response 799.02).

1332.01

Comment noted.

1332.02

EIS Volume IV, Appendix 9 presents an analysis that indicates that there are currently 43 residences in areas close to E and F sites that will have a day-night average sound level of greater than 70 dBA during the peak of construction (surface activities at E and F areas in support of a tunnel boring machine), and that there are currently 458 residences in areas close to E and F sites that will have a day-night average sound level of between 60 and 70 dBA. Surface activities supporting the tunnel boring machine at any specific E or F site are expected to be 24 h/d for 10 mo. Noise levels during operations are expected to result in a day-night average sound level of between 55 and 60 dBA for areas within 450 ft of a service area property line. Analysis presented in EIS Volume IV, Appendix 9 also indicates that there are currently 17 residences located within 450 ft of a service area property line. A detailed description of the relationship between day-night average sound level and human high annoyance may be found in Guidelines for Noise Impact Analysis (U.S. EPA, Office of Noise Abatement and Control, April 1982). The high annoyance function was developed from surveys of community reaction to primarily aircraft noise, as well as some traffic and railroad noise in urban areas.

1332.03

EIS Volume I, Chapter 3, Section 3.6 describes the conditions by which the DOE will mitigate noise impacts. The DOE commitment will be a function of the site selected, final facility location and design, and consultations with Federal, State, and local agencies. It is anticipated that noise control measures will be addressed and included in the course of detailed facility design and construction planning. The final mitigation plan will include procedures for monitoring sound levels for compliance with the plan.

The DOE is committed to construct and operate the SSC in compliance with applicable statutes and regulations (EIS Volume I, Chapter 6). A regulatory compliance plan will be prepared prior to construction. Identified mitigation requirements will be incorporated in the design of the SSC and in the construction plan. The direct costs of implementing the mitigation of impacts will be a part of the construction budget and the operating budget for the SSC.

1332.04

The calculation of noise levels at 4,000 ft from a spoils truck (EIS Volume I, Chapter 5, Section 5.1.4) is conservative in that it considers only geometric spreading of acoustic energy (6 dB reduction for doubling of distance) and does not consider absorption by air, ground surfaces, or vegetation. Also, it is a calculation of peak instantaneous sound level, not hourly equivalent level (L_{eq}) or day-night sound level (L_{dn}).

1332.05

The statement "Mitigations which could reduce the degree of impact of spoils hauling include specifying routes which avoid residential concentration and enforced truck muffler enforcement" appears in the EIS in Volume I, Chapter 5, Section 5.1.4. Applicable noise abatement criteria in the region of the proposed Illinois SSC site have been promulgated by the State of Illinois, the Federal Highway Administration (FHWA), and the Department of Housing and Urban Development (HUD). The Illinois Environmental Protection Agency delineated its noise guidelines in Title 35, Subtitle H (Noise) of its rules and regulations (EIS Volume IV, Appendix 5, Section 5.3.5). If Illinois is chosen as the selected site, more specific mitigation planning will be included in the supplemental EIS.

1332.06

Details of service area noise emissions are given in revised EIS Volume IV, Appendix 9, Section 9.1.3.1. Using results of analysis of recent aerial photographs as a guide to population density in the area, it has been estimated that 45 people live in an area in which sound level related to SSC operation will be between 55 dBA and 60 dBA, i.e., within 700 ft of the center of a service area (EIS Volume IV, Appendix 9, Section 9.1.3.5.B.2 a).

1332.07

The assumptions regarding noise mitigation design of service facility noise sources are described in Volume 1, Chapter 5, Section 5.1.4.2. The assumed measures are generic in nature and their descriptions were provided for the purpose of comparing sites.

The Supplemental EIS will describe site-specific mitigation measures which can be implemented to reduce the extent of noise generation by, and propagation from, construction activities and operation of SSC facilities. Implementation of these measures will limit the number of people who will be annoyed by noise related to the SSC. Through the application of noise control technology and implementation of administrative controls, noise impacts can be greatly reduced or eliminated altogether.

The Occupational Safety and Health Administration (OSHA) standards are not applicable to community noise. Rather, they are written and enforced for the protection of on-site employees of the facility. A good noise control design takes into account the restrictions which OSHA standards place on the working environment, putting the necessary noise controls in place during the design stage. The DOE will comply with all applicable OSHA noise regulations.

1333.01

See Comment Responses 1007.01 and 1169.04.

1334.01

Comments noted.

1335.01

See Comment Response 1007.01.

1335.02

See Comment Response 1007.01. There are no known geological hazards near the proposed North Carolina or Texas sites (EIS Volume I, Chapter 4, Section 4.1.5). DOE representatives discussed methane occurrences with the Illinois State Geological Survey, and discussed the TARP project with TARP engineers. Methane-related deaths in that tunnel project were not indicated.

1335.03

The traffic analysis is presented in EIS Volume IV, Appendix 14, Section 14.2.1.3.C. Mitigations will be addressed in more detail in the Supplemental EIS for the selected site.

1335.04

The Figure showing 290 trucks per day (see EIS Volume IV, Appendix 10, Section 10.2.3.3.A.1) has been changed to 144 trucks per day in the Errata.

The maximum number of trucks going to quarry No. 1 is presented as the worst case reasonably forseeable. Average truck traffic will be less (see EIS Volume IV, Appendix 10, Section 10.2.3). Mitigations to be considered include the use of highways instead of local roads, direction of traffic away from residential areas and schools, use of traffic controls and speed limits, and development of off-peak oriented trucking schedules. Additional disposal sites may be considered if the four proposed disposal sites are unable to meet the needs. Specific mitigation options for the selected site will be further developed in the Supplemental EIS.

1336.01

Comments noted.

1336.02

Regions of Influence (ROI's), as discussed in the EIS Volume IV, Appendix 14, enclose those local areas for which project-related socioeconomic impacts may be significant. As such, Wyoming is outside the defined area; however, we note that Wyoming may be in a position to help mitigate employment related impacts.

1336.03

The DOE acknowledged that the existing transportation systems discussed in EIS Volume IV, Appendix 5, Section 5.2.11.2.A and the proposed transportation system modifications discussed in EIS Volume IV, Appendix 14, Section 14.2.1.3.B will allow the effective transportation of materials and supplies to the Colorado SSC site during both construction and operations. Resources and materials available for project construction are addressed in EIS Volume IV, Appendix 6.

1336.04

Comment noted.

1336.05

Regarding the portion of the comment stating that no part of Wyoming is included in the Region of Influence for the Colorado SSC site, see Comment Response 1336.02.

The portion of the comment correctly describing Colorado's SSC site as being about 85 mi from Wyoming's proposed site is noted. With regard to the existing transportation system see Comment Response 1336.03.

Daily one-way commutes to work averaged less than 26 min for workers in the Denver-Boulder SMSA in 1980 (U.S. Bureau of the Census, Census of Population and Housing, 1980). If we assume that construction workers are willing to travel twice that distance on the average, then one-hour commutes to work should not be considered unusual. Further assuming the existence of Colorado's proposed highway linking the SSC to the Denver metropolitan area, it becomes reasonable to expect a sizable number of SSC construction workers to commute from the Denver area. As the comment states, however, the Cheyenne area is closer to two hours from the SSC. Although it is possible that some workers would choose to commute this distance daily, the likelihood is small that many would do so.

The availability of cement and construction materials in the region, as outlined in the comment, concurs with the information summarized in EIS Volume IV, Appendices 1 and 6. The comments concerning Wyoming tax rates are noted.

1336.06

See Comment Response 577.02 regarding the probability of developing aggregrate sources outside of the Denver region for construction of the SSC.

1336.07

See Comment Response 1336.02.

1337.01

The basis of the housing evaluation for Morgan County included in the EIS considered the low number of year-round units present (roughly 8,900 in 1980), the limited amount of countywide housing construction between 1980 and 1987 (averaging less than 60 units per year), and the traditionally low-to-moderate vacancy rates in Morgan County (see EIS Volume IV, Appendix 5, Section 5.2.11.1.B). The number of available units noted in the study attached to the comment would have to absorb "natural" increases in housing demand, as well as that attributed to the SSC. Moreover, this available housing stock is still well short of that projected during the peak demand expected as a result of the project.

Despite the number of contractors with licenses in Morgan County, the fact remains that relatively little housing was built within the county over the past several years. Similarly, although a number of lots are platted, many with utility connections, these do not signify available housing units. The EIS does not say that Morgan County will be unable to meet SSC-related housing demands. Rather, it suggests that a focused effort will be required to accommodate these housing demands. Increased production of year-round housing units by contractors licensed within the county and the use of currently platted lots would help to meet project-related increases in demand.

1338.01

Comments noted. The DOE does not agree that the SSC would be "disastrous to the environment," although the project would have various adverse impacts as described in EIS Volume I, Chapter 5. Planned and possible mitigations for adverse impacts are also discussed in EIS Volume I, Chapter 5.

1339.01

See Comment Response 278.08. See EIS Volume IV, Appendix 14, Section 14.1.3.5.D for a discussion of the impacts on State and local public finances. See EIS Volume IV, Appendix 4, 4.4.5, for a discussion of the land acquisition plans and potential relocations. See also Comment Response 880.04.

1339.02

Radiation from the SSC will not harm trees. The SSC is a large machine. When the machine is turned off, the beam of protons is turned off and the main source of radiation is off (see EIS Volume IV, Appendix 10, Section 10.1.2.3.A). A detailed discussion of radiation may be found in Comment Response 810.05. The radiation exposure from SSC operations has been calculated; it is a very small fraction of what an individual receives from natural background radiation (see EIS Volume I, Chapter 5, Section 5.1.6.2).

While the SSC is being constructed some dust will be raised during the digging of the tunnel and building roads and buildings. The DOE will require that construction and operating contractors comply with all applicable Federal, State, and local environmental protection regulations, guidelines, and standards (see EIS Volume I, Chapter 6).

The DOE has committed to additional fugitive dust control measures to ensure that all airborne dust concentrations, both during construction and operations of the SSC, will be in compliance with all applicable health-based standards.

1339.03

The EIS considers the impact of the water requirements of the SSC on the existing water availability in the proposed locations. The evaluation considers both the requirement for water to the SSC project (direct demand, or on-site) and the increased requirement for domestic water to support the increased population (indirect demand, or off-site). The results of the evaluation are summarized in EIS Volume I, Chapter 5, Section 5.1.2.4. At the Tennessee site, the State proposes that most of the water required would be provided from surface water supplied by a number of existing municipal water supply systems. For the Tennessee site, the results of the evaluation indicate that the combined primary and secondary water use for both the construction and operational period will represent a small percentage (generally less than 10 percent) of the total available excess water of these systems. Even if the smaller systems are assumed to provide all on-site and off-site water, sufficient excess capacity exists. Therefore, the expected impacts are negligible.

1340.01

Comments noted. Cost estimates are discussed in Volume IV, Appendix 2 of the EIS.

1341.01

See Comment Response 773.03. The effects of increased traffic and increased enrollment in schools as a result of the SSC are discussed in EIS Volume IV, Appendix 14, Sections 14.1.3.5 and 14.2.1.3.

1341.02

See Comment Responses 870.01 and 1369.09.

1342.01

The site selection criteria (see Volume III, Chapter 1 of the EIS) were developed in order to select the best site for the SSC. The amount of Federal funding currently in projects near any of the proposed alternative sites is not a consideration in site selection.

Comments noted.

1343.01

Comments noted.

1344.01

Comments noted. See Comment Response 974.01.

1344.02

Comments noted.

1344.03

See Comment Response 1013.02.

1344.04

See Comment Response 1279.141.

1344.05

See Comment Response 1237.02.

1344.06

Groundwater resource characteristics in Illinois include a predominantly unconfined aquifer in glacial drift with depth to the water table ranging from 5 to 70 ft below land surface (EIS Volume I, Chapter 4, Section 4.2.2). This indicates a direct hydrological connection between surface and groundwater. Construction practices applied to minimize groundwater quality impacts from normal construction and operations include in-place spill and leak response procedures, spill and leak containment designs or structures (e.g., lined ponds) for material with significant groundwater contamination potential, and established materials handling procedures. Wastewater can be treated prior to discharge or ponding to remove or minimize the groundwater contamination potential (EIS Volume IV, Appendix 7, Section 7.2.2.2).

1344.07

See Comment Response 1275.11.

1345.01

The zone of potentially higher initial inflows noted in the EIS (the area of E3-F3-E4) was identified based on hydrological tests done in

several borings in that area. One boring, S19, near F3, had particularly high yields from a less than 10 ft-wide fractured zone near tunnel depth. Tests in two other borings in the area also indicate somewhat higher permeability than elsewhere in the site. The rate of water inflow into the tunnel in this area (see Comment Responses 1237.02 and 1279.357) is within the capacity of the planned silt retention (settling) ponds.

1345.02

See Comment Response 1217.01.

1345.03

The results of hydrologic testing in borings drilled by the Illinois State Geological Survey indicate that somewhat higher inflows might occur in the area between E3 and E4 than elsewhere on the site. Water inflow into this segment will be removed from the tunnel at F3. Retention/siltation ponds at F3 will be adequate to handle any unusual water-control requirements without risk of overflow into nearby drainages (see Comment Response 1217.01).

1346.01

The impacts of the SSC on farmland were addressed in EIS Volume I, Chapter 5, Section 5.1.7.2. In Illinois, 185 acres of prime farmland would be permanently converted and 217 would be temporarily disturbed.

1347.01

Comments noted. According to the EIS, during the peak year of construction (1991), an estimated 10,361 jobs (including direct, indirect, and induced employment) would be attributable to the SSC in the State of Colorado (EIS Volume I, Chapter 5, Section 5.I.8). During the first year of full operation (2000) the total SSC-related jobs in Colorado is estimated to be 6,381 according to the EIS (Volume I, Chapter 5, Section 5.1.8).

1348.01

Comment noted.

1349.01

The DOE has described the potential environmental impacts associated with the construction and operations of the SSC (EIS Volume I, Chapter 5). The National Environmental Policy Act (NEPA) of 1969 (42 USC 4321 et seq.), as amended, requires all Federal agencies to prepare an EIS for proposed major Federal actions significantly affecting the quality of the human environment. In accordance with DOE guidelines for compliance with NEPA, DOE prepared an environmental impact statement

(EIS Volume I, Chapter 6, Section 6.1). Proposed mitigative measures are described in EIS Volume I, Chapter 5, Section 5.1. Implementation of these measures is expected to greatly reduce the overall impacts.

1350.01

Comments noted.

1351.01

See Comment Responses 7.03 and 1133.02.

1352.01

Comment noted.

1353.01

Comment noted.

1354.01

See Comment Response 1278.11.

1354.02

Disposal of spoils is discussed in EIS Volume IV, Appendix 10, Sections 10.2.3 and 10.2.3.7. The impact on traffic for affected major roads is presented in Volume IV, Appendix 14, Section 14.2.1.3 G.

Measures that could be implemented to mitigate spoil haul traffic impacts include: the use of State highways instead of local roads; direction of traffic away from residential areas and schools; use of traffic controls and speed limits; development of off-peak oriented disposal schedules; and planning tunnel boring operation in different quadrants to distribute traffic on several roads. The impacts of spoils trucks and other traffic will be addressed in greater detail in the Supplemental EIS for the selected site.

1354.03

The potential for impacts from blasting is discussed in EIS Volume 1, Chapter 5, Section 5.1.4.2.A.1, which also discusses procedures intended to mitigate these impacts.

Acoustical measures used in assessing noise impact are described in Volume I, Chapter 5, Section 5.1.4.1, and the potential for noise impacts is discussed in Section 5.1.4.1. The severity of the noise impact depends on the distance between the noise source and the people. A study of aerial photographs shows that approximately 25 people will experience outdoor day-night sound levels exceeding 70 dBA during construction at the Texas site. These people all live within 630 feet of an E or F area. Between 630 feet and 2000 feet there are 314 people who will experience day-night sound levels greater than 60 dBA. During operations there will be 19 people whose residences are less than 450 ft from a service area property line, a distance at which the day-night level will be between 55 dBA and 60 dBA. In all cases, when these people are inside a conventional structure, such as a permanent frame or

brick residence, the sound levels shown above will be reduced by 5 to 15 decibels.

1354.04

See Comment Response 1135.04.

1354.05

See Comment Response 1039.04.

1354.06

To maintain current levels of service in terms of police protection in Ellis County, an estimated six additional law enforcement employees would be required to cover SSC-related population impacts during peak construction; this requirement would decrease to five additional employees during SSC operations. For an explanation of the methodology used to determine this number, (see EIS Volume IV, Appendix 14, Section 14.1.3.7.D).

1354.07

Potential impacts to local public education in the Texas Region of Influence and Ellis County caused by SSC development are discussed in EIS Volume IV, Appendix 14, Section 14.1.3.7.C and summarized in Tables 14.1.3.7-6 and 14.1.3.7-7. To meet the projected increase in SSC-related demand, primary and secondary schools in Ellis County would need to expand instructional employment by 35 teachers in both 1992, the peak year of construction, and in the year 2000, the first year of full operation.

1354.08

See Comment Responses 1039.04, 1126.05 and 1478.12.

1355.01

See Comment Response 985.02.

1356.01

While the SSC is an experimental facility, it is possible to project the environmental safety and health implications based on existing performance and operational experience from similar facilities, such as Fermilab and CERN. It is not a nuclear reactor. It is a high energy proton accelerator for research purposes. The EIS addresses the potential for exposure at the ground surface in EIS Volume I, Chapter 5, Section 5.1.6.2 and Volume IV, Appendices 10 and 12, in which radiation doses were estimated. The groundwater with elevated radium in northern Illinois was discussed in Comment Response 1122.02. Noise pollution, air pollution, noise and vibration impacts are discussed in Volume I,

Chapter 5, and Volume IV, Appendix 9. Visual impacts of the SSC are discussed in EIS Volume IV, Appendix 16. Volume IV, Appendix 7, Water Resources Assessments, discusses the surface water resources and quality. Specific environmental consequences during the life of the SSC in the Illinois site are discussed in Volume IV, Appendix 5. Potential impacts from the increase volume of truck traffic are also addressed in the Volume I, Chapter 5.

1357.01

Comments noted.

1358.01

Comment noted.

1358.02

The EIS does not claim that a "high-tech" corridor will develop around the SSC. Numbers of direct and secondary jobs expected to be created by construction and operation of the SSC in Illinois, if the SSC is sited there, are presented in EIS Volume IV, Appendix 14, Section 14.1.3.3.A. The estimated total of these jobs is approximately 10,500. With regard to the potential opportunity costs associated with the SSC, it is expected that businesses having to move would relocate elsewhere in the region. See also Comment Response 1381.08.

1359.01

Comments noted.

1360.01

Comments noted.

1361.01

Geohydrologic conditions at the depth of the collider tunnel and experimental halls are discussed in EIS Volume I, Chapter 4 and Volume IV, Appendix 5, Section 5.6.2.2. The deep wells noted in the comment were included in the data set that was used to prepare the EIS. It gives some very important indications of the groundwater conditions at depth as follows:

- the wells have low to, at best, moderate yields, indicating generally low hydraulic conductivities at depth

- the fact that the wells are deep indicates that water-bearing fractures are quite infrequent in the stratigraphic column so that it is sometimes necessary to drill through a significant amount of rock before a productive well is encountered

- some of the borings were wholly unsuccessful at finding water in the Murfreesboro Formation (again demonstrating the infrequency of water-bearing fractures in that unit) and had to be drilled into the top of the underlying porous Knox Group before an adequate water supply was found.

The CERN experience with inflowing water is relevant to the SSC only in that it clearly shows that water flowing into a tunnel can be remedied; the inflow at CERN was stopped easily with normal underground engineering practices. Comment Response 1322.15 discusses the procedures that will be used during SSC construction for handling water inflows into the tunnel. Comment Responses 500.03 and 509.01 describe the methods that will be used to excavate the shafts down to tunnel level.

1361.02

See Comment Responses 523.03.

1361.03

It is felt that precautions other than the monitoring and collection system proposed by Dr. Crawford may be more appropriate for the Tennessee site. The purpose of these precautions will be to preclude contaminated water from entering the Stones River system. The systems will be selected and designed based on more detailed evaluation of the karst hydrology of the site and will be described in the Supplemental EIS if Tennessee is the selected site.

1361.04

The venting of radon and its decay products, and the possible buildup in the underground structures such as the tunnel or interaction region halls were concerns of health and safety professionals in preparation of the EIS. Experimental halls will be extensively ventilated. Tunnels will be ventilated prior to personnel access. It was determined that the increase in exposure to radon to the general public from venting the SSC facility is very insignificant. The dose to an individual due to radon and radon decay products during operation is 0.002 mrem, which is less than 0.001 percent of the Tennessee site background radiation. A comprehensive assessment of the radon source terms is presented in Volume IV, Appendix 10, Section 10.1.2.3.A.2. The health impact to the general public is addressed in Volume IV, Appendix 12, Section 12.3.1.1.B.

1361.05

The release of activation products was addressed in EIS Volume IV, Appendix 10; its consequent health impact was assessed in Volume IV, Appendix 12. The radionuclides assessed include hydrogen-3, beryllium-7, carbon-11, nitrogen-13, oxygen-15, chlorine-39, argon-41, radon-222 and its short-lived daughters. Most of these radionuclides are in gaseous

form, except Be-7, Pb-214, and Bi-214, which are particulates suspended in air. Doses to humans are estimated for total body and various organs, through five exposure pathways. These exposure pathways include:

- Immersion in air containing radionuclides
- Direct exposure from radionuclides deposited on ground surface
- Immersion in water containing radionuclides
- Inhalation of radionuclides
- Ingestion of food produced in the area

A generic 10 mph wind speed was not used. Meteorological data, including annual average frequencies of wind direction in 16 compass directions, wind speed, atmospheric stability category, annual rainfall rate, height of atmospheric mixing layer, and annual average temperature, were employed as input data to estimate the annual average concentration of each radionuclide at ground level as a function of direction and distance from the release point. All of the meteorological data were obtained from the weather station in the major metropolitan area nearest the proposed SSC sites. This is discussed in EIS Volume IV, Appendix 12, Section 12.2.3.1.B.

1361.06

The impact of the SSC construction and operations on water supply at the proposed Tennessee site is assessed in EIS Volume IV, Appendix 7, Section 7.1.3.6. The assessment indicates that water requirements for the SSC project and additional off-site domestic use can be met by public utilities in the project vicinity, which have adequate excess capacities. The excess capacities used in the evaluation were estimated for a drought condition with an average recurrence interval of about 20 years. The excess capacities for a more severe drought would be less, but such data are not currently available. The drought in the last few years may be more severe than a 20 year drought. More detailed study on water supply reliability for the project area, including Williamson County, incorporating information from the recent drought years, will be conducted and documented in a Supplemental EIS if the Tennessee site is selected for the SSC.

The DOE is committed to construct and operate the SSC in compliance with applicable statutes, regulations, and ordinances, including Durham County's watershed ordinance (EIS Volume I, Chapter 6 and Volume IV, Appendix 5, Section 5.5.10).

1361.07

Earthquake hazards are discussed in EIS Section 5.6.1.5 of Volume IV, Appendix 5. The faults at New Madrid, Missouri, are far enough away from the site (about 200 mi) that the 1811-1812 earthquakes there -- the largest historic earthquakes in the central United States -- caused only a low level of damage (Modified Mercali Intensity V to VI) in the site region. Such low levels of earthquake shaking are easily accommodated in structural design.

1361.08

Comment noted.

1362.01

Comment noted.

1362.02

The air quality impact of the proposed SSC project is summarized in EIS Volume I, Chapter 5, Section 5.1.3, and Volume IV, Appendix 8.

1362.03

Comment noted. See Comment Response 1170.03.

1362.04

As indicated in EIS Volume IV, Appendix 5 and Volume I, Chapter 4, a localized existing source of hazardous/toxic materials (such as a soil or groundwater contamination site) would be quite relevant if it were to be encountered during the construction process. A fair amount of surface facilities construction, as well as vertical shaft boring, will take place for the SSC.

1362.05

See Comment Response 1279.357.

1362.06

It is DOE policy that Fermilab will continue to be supported on the merits of its physics research program whether or not the SSC is located in Illinois.

1363.01

There would be homes in the referenced subdivision outside the fee simple area of the far cluster from which F5 would be visible. Sensitivity for views of the F5 from the subdivision is considered to be high. The discussion of the impact of F5 on those views has been revised in EIS Volume IV, Appendix 16, Section 16.3.3.3 and Volume I, Chapter 5, Section 5.1.10.3.C.

1363.02

Comment noted.

1364.01

See Comment Response 979.02.

1364.02

See last paragraph of Comment Response 979.02.

1364.04

See Comment Response 13.02 and 710.01.

1365.01

See Comment Responses 710.01 and 880.04.

1365.02

See Comment Response 1237.02.

1365.03

See Comment Response 1369.09.

1365.04

Some of the mitigations to be considered for reducing the impacts on area residents include the use of highways instead of local roads, direction of traffic away from the residential areas and schools, use of traffic controls and speed limits, and development of off-peak oriented trucking schedules. These mitigations will be addressed in a Supplemental EIS for the selected site.

1365.05

Comment noted.

1366.01

See Comment Response 1504.01.

1366.02

Information on the proposed new road construction and upgrading of existing roads is presented in EIS Volume IV, Appendix 14, Section 14.2.1.3 E.

Secondary impacts due to new highway construction are addressed in Volume IV, Appendix 14, Section 14.2.1.3 E.1.a.

Cumulative traffic impacts are addressed in Volume IV, Appendix 14, Section 14.2.1.3 H.5.

1366.03

Comment noted.

1366.04

Your name will be added to our distribution list. The schedule for the identification of a selected site and the publishing of the Record of Decision does not provide for additional public hearings (see EIS Volume III, Chapter 3). See the cover sheet to Volume I of the EIS for a discussion of the Supplemental EIS to be done prior to deciding to construct or operate the SSC.

1366.05

See Comment Response 773.03.

1366.06

A mailing list for the SSC EIS will be maintained as a result of a postcard solicitation for requests to be included on the list, and selected site information will be forwarded to the listed individuals.

1368.01

The observations on the hydrology of the Illinois site are consistent with the data used to prepare the EIS (see Volume IV, Appendix 5, Section 5.3.2.2) and are not at odds with the Illinois Department of Energy and Natural Resources' hydrogeologic characterization of the site. The complexity described is due to the existence of three aquifers in the region, two above and one below the proposed tunnel depth. The two upper aquifers, called the glacial aquifer and the upper bedrock aquifer are the ones most used for rural and domestic water supply. The tunnel will be in a relatively impermeable layer beneath these aquifers and will not affect them. The third aquifer, called the deep sandstone or Cambrian-Ordovician aquifer, is below the tunnel and likewise will not be affected by the tunnel.

1368.02

It is true that there are vertical connections between the various geologic formations which allow water to percolate from the surface to the deeper aquifers. These connections are localized, however, and much

smaller than the larger areal extent of confining layers and aquitards (i.e., layers with very low hydraulic permeability). Consequently, the majority of the groundwater flow in the vicinity of the proposed Illinois site is horizontal rather than vertical. See EIS Volume IV, Appendix 5, Section 5.3.2.2 for more detail. Consequently, pollutants at the surface are not expected to penetrate into the deeper aquifers to any measurable extent, and the small amount moving vertically will move very slowly, allowing time for chemical alteration and for sorption (i.e., retention) by the shallower soils and rocks. For the same reasons, the incremental effect of the SSC project's water withdrawals from the deeper aquifers is not expected to have a measurable effect on the shallower water tables, even if they will have a measurable effect on the current overdraft of the deeper aquifers. This conclusion is borne out by the fact that the potentiometric surface of the Cambrian-Ordovician aquifer has been lowered several hundreds of ft in some areas since groundwater pumping began in the 1800s, without a corresponding lowering of the shallower water tables. See also Comment Responses 533.03 (groundwater supply and overdraft impacts) and 1381.11 (groundwater quality impacts).

The radiological effects of the tunnel operations on the surrounding groundwaters will be negligible even on the immediately surrounding groundwaters (see EIS Volume I, Chapter 5, Sections 5.1.6.2.A and 5.1.6.3.A). Again for the reasons stated above, radiological effects on both shallower and deeper aquifers will be extremely small and well within regulatory standards. See also Comment Response 870.04 (radiological impacts).

Although hydrological conditions are different at the other sites, various levels of water resources impacts are projected at all of them. Also, there are people living in the vicinities of all sites, although their number and the distance of their residences from the sites vary greatly. These aspects will be considered, among other factors, in the site selection.

1368.03

See Comment Responses 1368.01 and 1368.02.

1368.04

See Comment Response 1368.01 and 1368.02.

1369.01

The comparison of impacts at the seven site alternatives is summarized in EIS Volume I, Chapter 3, Section 3.4.

1369.02

Commonwealth Edison electric rates were included in the analysis of costs in EIS Volume IV, Appendix 2, Section 2.4.3, as discussed in the

Comment Response 1374.01. The electric rates projected for the Illinois site were the second highest among the seven BOL sites. Electric power represents a substantial portion (more than 15%) of the projected SSC operating costs.

Electrical load impacts to Commonwealth Edison due to SSC induced secondary population growth are addressed in EIS Volume IV, Appendix 14, Section 14.2.2.3.C.1.b. Secondary cost impacts to existing utility customers are discussed in general terms in EIS Volume IV, Appendix 14, Section 14.2.2.2.C.

1369.03

Comment noted. Also, see Comment Response 1275.11.

1369.04

See Comment Response 1279.357.

1369.05

The impact of soil erosion and stream sedimentation caused by the proposed Illinois SSC project will be mitigated by minimization of disturbed areas, rapid revegetation, and well-maintained sediment basins. Detailed discussion of impact mitigations are presented in EIS Volume I, Chapter 5, Section 5.1.2.1 and Volume IV, Appendix 7, Section 7.1.2.2.D.2.

Potential impacts of the SSC project on surface water quality may result from surface erosion, channel erosion, pollutant washoff, dewatering the tunnel, and increased wastewater treatment plant effluent. EIS Volume IV, Appendix 7, Section 7.1.3.3.F presents an assessment of the potential impacts and mitigative measures. Potential impacts on groundwater could result from surface and subsurface construction, disposal of wastewater from tunnel and shaft dewatering, and leaching of spoils. Volume IV, Appendix 7, Sections 7.2.3.3.A.4 and 7.2.3.3.B.2 assess the potential impact on groundwater quality and present possible mitigative measures.

The assessment indicates that, with proper mitigative measures, impacts to surface water and groundwater quality can be minimized, and applicable regulations and water quality standards will be complied with.

1369.06

As noted in EIS Volume I, Chapter 3, Section 3.4 Illinois would need to acquire the most parcels of any of the seven alternative sites. The proposed project schedule (EIS Volume IV, Appendix 1, Section 1.1.4) would require Illinois to provide access agreements to the DOE by January, 1989 to allow performance of preconstruction activities including geotechnical verification and resource assessments. Furthermore, the actual construction schedule is predicated on the land acquisition

sequence from March, 1990 to January, 1991 agreed to by the proposing States. Failure of the State to meet this land acquisition schedule would most probably result in construction delays. See Comment Response 880.04.

1369.07

See Comment Response 1314.31.

1369.08

At the selected SSC site, detailed cultural surveys will be accomplished by the DOE in consultation with the State Historic Preservation Officer, SHPO. See also Comment Response 1486.03.

1369.09

Table 4-26 of the EIS (see Volume I, Chapter 4) presents a comparison of the population sizes at the proposed sites. The information presented in the EIS supports the commenter's observation that the most heavily populated of the proposed sites is the site in Illinois. The population data presented in the EIS were the 1980 census results and 1985 estimates. Growth trends at the sites were considered. The DOE recognizes that the population figures used in the EIS are estimates. There is no reason to believe that the use of these estimates affects the reliability of the conclusions regarding environmental or health and safety aspects of the proposed SSC.

The concern that people would be adversely impacted by the SSC and that a more heavily populated site would be more severely impacted is recognized. The EIS considered potential impacts from noise, air pollution, radiation, and other sources, and social and economic effects at all sites. The principal conclusion of the EIS is that there would be no adverse impacts on the health and safety of people residing near any of the proposed sites, regardless of population size (see Volume I, Chapter 5, Section 5.1.4 and 5.1.6).

1369.10

See Comment Response 1007.12.

1369.11

EIS Volume I, Chapter 3, Section 3.1.2 discusses the ISP requirements. The ISP did not require the proposers to report population by parcel nor did it require that the land acquisition area be shown on parcel maps outside of areas required by the DOE. However, other sections of the ISP require information on areas in close proximity to the SSC facility. Analysis in EIS Volume IV, Appendix 9 and 13 cover the subjects of noise, vibration and visual impacts and the proposed mitigations. Also see Comment Response 710.01.

1369.12

The DOE recognizes its responsibility to properly dispose of low-level radioactive wastes and is committed to following all applicable regulations regarding the disposal of conventional, radioactive, and hazardous wastes (see EIS Volume I, Chapter 6). Programs that will be implemented to manage and dispose of low-level wastes will be based in part on the experience gained from waste disposal at Fermilab. For example, a waste minimization program was implemented at Fermilab in 1987 that will be a appropriate model for the SSC. At Fermilab, procedures have been instituted for screening, sorting, and recycling materials; this program has been effective in reducing the amount of low-level waste twentyfold and will be considered as a candidate for implementation at the SSC (see EIS Volume IV, Appendix 12, References - "SSC Safety Review Document," Sep 1988, SSC Central Design Group, Universities Research Association, p. 91). For additional information about the plans for disposal of low-level radioactive wastes, see Comment Response 229.06. The comment about Fermilab's use of "state of the art in 1940" methods is not relevant in view of the fact that Fermilab was designed and built in the late 1960's and early 1970's and employed the most up-to-date technology available at that time.

1369.13

The comments are consistent with the EIS as presented in Volume I, Chapter 3, Section 3.1 and Volume IV, Appendix 1.

1369.14

See Comment Response 1195.06 regarding projected dose equivalents to residents and school students from direct beam irradiation and airborne radionuclides.

It is DOE policy that radiation exposures should be kept as low as reasonably achievable (ALARA). (DOE Order 5480.1 Chapter XI). The ALARA concept will be examined more fully in the Supplemental EIS.

1369.15

See Comment Response 1007.13.

1369.16

EIS Volume I, Chapter 4, Section 4.6.1.1 gave statistics pertaining to radon levels present in living spaces and in basements in the regions of the proposed sites. Information was based primarily on the data collected by the University of Pittsburgh Radon Project and its successor, The Radon Project, up to August 1987. Detail data were presented in EIS Volume IV, Appendix 5, Table 5.3.6-1. These data include 434 living space measurements and 322 basement measurements in DuPage County and 13 living space measurements and 7 basement measurements in Kendall County. In addition to these data, 31 first-floor measurements and 134 basement

measurements in DuPage County, 2 first-floor measurements and 26 basement measurements in Kendall County, and 12 first-floor measurements and 59 basement measurements in Kane County were summarized from a publication prepared by Mr. Gilkeson, who cited John Cooper's data. These data show the radon level in 43 percent of the 59 basements tested is less than 4 pCi/l; and 54 percent of the 59 basements is between 4 pCi/l and 20 pCi/l. Radon levels measured in the first floor of 12 homes is below 4 pCi/l. Only 25 percent of the house has a radon level above the EPA "recommended action level" of 4 pCi/l (This recommended action level is not the EPA "standard." Currently there is no EPA "standard" set for residential indoor radon level.)

The health impacts from radiation during SSC operation has been assessed in EIS Volume IV, Appendix 10 and Appendix 12. There is no measurable adverse impact from cumulative effects of exposure to radon in residential buildings and exposure to radiation from SSC operations. Although the dose equivalent from SSC operations is primarily through the air pathway, the exposure is less than 0.001 percent of that from background radiation. The variation between radon levels between the proposed sites is well within normal variations found throughout the U.S.

1369.17

Several communities in Illinois, including in the vicinity of the SSC site, have been notified by the EPA that their groundwater supplies exceed federal interim drinking water standards for radium. Other communities with high radium concentrations in the groundwater are already treating their supplies. Some of the notified communities are in the process of installing treatment systems, in order to reduce the radium levels below regulatory standards. The increase in radiation in groundwater supplies as a result of the SSC will be very small, and meet regulatory standards both during the routine operations and for the unlikely event of a beam-loss accident. The radiological effects of the project on groundwaters are described in EIS Volume I, Chapter 5, Sections 5.1.6.2 and 5.1.6.3. See also Comment Response 870.04.

1369.18

See Comment Responses 1007.03 and 1007.04.

1369.19

See Comment Response 733.02 which addresses electromagnetic fields from overhead power lines.

See also Comment Response 1197.02 which addresses magnetic fields from the SSC magnets.

1369.20

See Comment Response 1205.02.

1369.21

See Comment Response 1175.04

1369.22

See Comment Response 1275.11.

1369.23

The wetland assessment has been revised based on a post-DEIS survey of the alternative sites to include the most current information on wetland location, type, and quality (see EIS Volume I, Section 5.1.5.4 and Volume IV, Appendix 11, Section 11.3.3.3). This assessment also considers the wetlands acreage which could potentially be disturbed by construction, and the types of mitigations available to reduce impacts. Once a site has been selected, final facility sitings will be made and will take into consideration encroachment on wetlands, avoiding these whenever possible. Plans to mitigate wetland impacts will be developed with the U.S. Army Corps of Engineers to further reduce wetland loss.

1369.24

The information provided in the comment is consistent with EIS Volume IV, Appendix 11.

1369.25

See Comment Response 1126.05.

1369.26

Comments noted.

1370.01

Comment noted.

1370.02

See Comment Response 710.01.

1370.03

Comment noted.

1371.01

Comment noted.

1371.02

See Comment Response 876.01.

1371.03

See Comment Response 958.04.

1371.04

See Comment Responses 958.04 and 1278.19.

1371.05

See Comment Responses 1007.03 and 1007.04.

1371.06

See Comment Response 1292.07.

1371.07

See Comment Response 1007.13.

1371.08

See Comment Response 1007.11.

1371.09

See Comment Response 854.17.

1371.10

The general siltation pond designs in this EIS are based on available general assessments of water requiring treatment. Final size and design will be based on site-specific conditions. The ponds will be designed to hold the maximum amount of water anticipated for treatment based on site-specific water flow estimates. See Comment Response 1369.05 regarding the potential for mitigation of sedimentation impacts to surface water.

1371.11

Comment noted.

1372.01

See Comment Responses 1114.04 and 1126.05.

1372.02

See Comment Response 1148.04.

1372.03

Comments noted.

1373.01

Comments noted.

1373.02

The DOE believes that issues impacting on people residing close to the SSC facility have been adequately considered in the EIS. See Comment Response 1126.05.

1373.03

Comments noted.

1374.01

The electric energy usage for construction and operations is presented in EIS Volume I, Chapter 3, Section 3.5. The future SSC energy costs for each site were estimated and evaluated in the development of life cycle costs.

The electric rates used in the life cycle cost estimate for the Illinois site were the second highest among the seven alternative sites. Electric costs represent a substantial portion (more than 15 percent) of the projected SSC operating costs.

The potential cost impact to current utility customers is presented in general terms in EIS Volume IV, Appendix 14, Section 14.2.2.2.C.

1375.01

See Comment Response 1279.115.

1375.02

Please refer to Comment Responses addressing water quality, water supply, and total water resource impacts: 7.03, 533.03 and 1133.02.

1376.01

Comment noted.

1377.01

Comments noted.

1378.01

See Comment Responses 1229.02.

1379.01

If property is located in an area to be affected by stratified fee, no restriction will be placed on existing surface activities. See Comment Response 312.05. Areas taken in fee simple will be restricted to the DOE's general policy on outleasing. See Comment Response 275.04. The process described is a competitive procurement and not an arrangement with a former owner.

1380.01

Comment noted.

1381.01

Whether individual communities choose to utilize Lake Michigan as a water source is a question outside the scope of the SSC. The regional overdraft condition which will be eased by use of Lake Michigan water would exist regardless of whether the SSC is sited in Illinois or not. If the SSC were to choose to connect to a public water supply derived from Lake Michigan, it would pay for that connection as part of its utility bills. Similarly, individuals moving into the area as a result of the siting of the SSC would pay for their water use from any public supply system.

See also Comment Response 1279.115 for a general discussion of overdraft conditions.

1381.02

As discussed in EIS Volume IV, Appendix 5, Section 5.3.2.1.C, the Fox River would be used as an alternative water supply only if future groundwater levels in the project area decline to unacceptable levels. Current surface water use (all from the Fox River) in the SSC project area is much less than 1 percent of the average river flow. If all industrial water for the SSC campus area were also withdrawn from the Fox River, total withdrawals would still be significantly less than 1 percent of average river flow and the river flow would not be reduced significantly.

1381.03

Radionuclide migration in groundwater was addressed for the maximum input of accelerator-produced radionuclides. This was based on a hypothetical beam loss accident. Even as close as 50 m from the loss point,

the exposures from accelerator-produced radionuclides were below the standard of 4 mrem/yr for public drinking water established by the U.S. EPA (see EIS Volume IV, Appendix 12, Section 12.2.3.1.C). During construction, no accelerator-produced radionuclides will exist. Monitoring will be conducted during construction and operation in accordance with DOE Orders as a requirement of environmental regulations designed to prevent unacceptable releases.

1381.04

All of the State proposer groups have indicated that the State will provide a replacement well or a water supply source of equal or better quality to any individual whose water supply is lost due to the SSC. The details of implementation are not known at this time. These will be defined and described in the Supplemental EIS for the selected site.

1381.05

See Comment Response 1217.01.

1381.06

Regularly measuring air quality at the site during construction, as a mitigation measure (see EIS Volume I, Chapter 5) was evaluated and not considered to be required from a regulatory or technical perspective at this point.

Compliance with AAQS will be addressed by the host state when its air pollution regulatory agency reviews any required permit applications.

1381.07

Noise emissions from equipment and trucks would be monitored (in Illinois in accordance with State of Illinois Rules and Regulation Title 35 (Noise), Subtitle H, Chapter I, Part 902 if Illinois is the selected site). The DOE would consider the use of noise-reduced equipment or additional muffling devices during detail construction planning. Noise mitigations are discussed in EIS Volume IV, Appendix 9 and Volume I, Chapter 3, Section 3.6.

1381.08

Estimates of the fiscal impact to local jurisdictions in DuPage, Kendall, and Kane Counties in Illinois are presented in EIS Volume IV, Appendix 14, Section 14.1.3.3.D. Some farms, homes, and businesses would be displaced as private real property is purchased by the State for transfer of ownership to the Federal Government. An estimate of the market value of real property which would be displaced is shown in Appendix 14, Section 14.1.2.3.A.4, Table 14.1.2-8. Compensation for the real property would enable these private owners to relocate in the area

if they so choose. The EIS assumes that most displaced farms and businesses would relocate within the Region of Influence (ROI), or if they do not relocate within the ROI, the local market would provide opportunity for other firms in the ROI. It is possible that no jobs or revenue would be lost to the region as a result of these relocations. If the Illinois site is selected as the site for the SSC, this issue would be analyzed in greater detail in the Supplemental EIS.

1381.09

See Comment Response 1200.04.

1381.10

The observations are consistent with the data used to prepare the EIS. See EIS Volume IV, Appendix 5, Section 5.3.2.2 for a discussion of groundwater at the site.

1381.11

Groundwater quality at the proposed Illinois site is addressed in EIS Volume IV, Section 5.3.2.2; the hardness and iron content listed in the comment is in the range of values listed in Table 5.3.2-5, and the occurrence of radium is noted in the text. The occurrence of oil and gas is addressed in the same Appendix in Sections 5.3.1.5 and 5.3.1.6. Radon gas, formed by the decay of naturally occurring uranium in various rocks, is addressed as part of the radiological assessments in Volume I, Chapter 5, Section 5.1.6.2.

Water quality impacts of the construction and operations of the SSC at the proposed Illinois site are discussed in Volume IV, Appendix 7, Sections 7.1.3.3 and 7.2.3.3. Small, but negligible water quality impacts are expected for shallow groundwaters. Construction impacts will be held to negligible levels through minimization of disturbed areas, in-place spill and leak response procedures, and control and minimal use of construction materials with potential for water contamination. Impacts of liquid effluents (i.e., sanitary sewage, cooling tower blowdown, and sump water) during operations will be negligible since extensive treatment of the effluents is planned to meet effluent quality standards. The construction and operations of the SSC at the proposed Illinois site are not expected to have measurable impacts on the quality of deep groundwaters. The negligible amount of contamination of the shallow groundwaters will be prevented from moving deeper by the sorptive capacity of the soils and rocks and by confining layers and aquitards between the lower and deeper aquifers. Although vertical interconnections exist between the aquifers, they are localized and regional groundwater flow is essentially horizontal rather than vertical. For the excavations, including the tunnel, the surrounding groundwater pressure will result in infiltration into the tunnel rather than water flowing out of the tunnel; this will essentially prevent contamination of the aquifers from the tunnel excavation. Radiological

effects are also projected to be negligible and well below existing standards (see Volume I, Chapter 5, Section 5.1.6.2.A). The radiation emitted during normal operations is extremely small. Even the groundwater contamination resulting from the highly unlikely loss of a beam (the worst-case accident) will meet regulatory standards (see Volume IV, Appendix 12, Sections 12.3.1.1.C and 12.4.1.1).

1381.12

It is not anticipated that any additional land south of Fermilab will be required by the SSC. All land south of Fermilab that would be required by the project, comprising SSC Injector Area C, lies within Fermilab property.

The EIS public finance analysis accounted for losses in property tax associated with the SSC. The results of this analysis for the Illinois Region of Influence, and for the primary impact counties of DuPage, Kane, and Kendall, are presented in EIS Volume IV, Appendix 14, Section 14.1.3.3.D.

1381.13

A visual impact is of local scope when it affects views from travel routes and areas primarily of local importance, such as city parks, residential areas, or locally designated scenic routes. See EIS Volume IV, Appendix 16, Section 16.2.3.2 for a discussion of visual sensitivity criteria. In Illinois, the significant visual impacts expected would affect views from residential areas. The impacts are, therefore, considered to be local in scope. Sensitivity, on the other hand, is moderate to high, depending on whether it is a rural residential area or subdivision that is affected. In several cases, sensitivity has been described as high.

The noise impact analysis has been enhanced by extending it to the number of people experiencing specific noise levels. EIS Volume I, Chapter 5, Section 5.1.4 and Volume IV, Appendix 9 of the EIS describe the areal extent and expected impacts on people living within the defined areas from continuous noise produced during construction and operations of SSC facilities. Analysis presented in EIS Volume I, Chapter 5 indicates that 454 people currently live in locations near E and F areas that will have a day-night average sound level of between 70 and 75 dBA during the peak of construction (coinciding with the surface activities that support the tunnel boring machine), and 1,245 people currently live in areas that will have a day-night average sound level of between 60 and 70 dBA during construction. The analysis also indicates that 45 people currently live in locations near F areas that will have a day-night average sound level of between 55 and 60 dBA during operations.

1381.14

A statement in the EIS that the tunnels and access shafts of the decommissioned SSC will never be used as a waste dump site for radioactive materials, medical waste, or chemical waste is inappropriate, although it is true that DOE has no plans to use the tunnel or shafts in such a manner. Radiological and hazardous waste disposal sites today are highly specialized facilities that go through strenuous permit approval processes before they can be sited and operated.

1381.15

Estimates of the cumulative fiscal impact to local jurisdictions in DuPage, Kendall, and Kane Counties in Illinois are presented in Volume IV, Appendix 14, Section 14.1.3.3.D. This analysis accounts for the costs for SSC growth-related personnel increases and capital improvements for schools, police, fire, and general government.

1381.16

See Comment Response 871.07.

1381.17

In response to:

1) Fears of the unknown -- See Comment Response 1259.02.

2) Loss of property value -- See Comment Response 1229.02

3) Higher taxes -- See Comment Response 1478.11

4) Loss of the rights of their land -- See Comment Response 1047.02

5) Fear of contaminated water -- See Comment Responses 1143.04 and 1200.04, first paragraph

6) Fear of quality of life -- See Comment Response 971.01

7) Vacant land would be difficult to develop because of the ring easements -- See Comment Response 1047.02.

1382.01

Comment noted.

1382.02

See Comment Responses 533.03 and 1013.02.

1382.03

See Comment Responses 1237.02 and 1279.357, which indicate that water infiltration into the tunnel would not place the project in jeopardy in Illinois.

1382.04

See Comment Response 1007.02.

1382.05

Radium occurs in groundwater as a result of the natural decay of uranium and thorium which occur in trace amounts in various types of rocks. This is a common problem with certain water systems obtaining their water from deep aquifers to the east of the proposed Illinois SSC site. Additional studies would be needed to determine if increased pumping of deep aquifers as a result of the project would increase the radium levels in the water supply. These studies may be conducted if the proposed Illinois site is selected. Even for increased radium levels in groundwater supplies, suitable treatment technology exists to reduce the radium concentrations to safe levels as required by drinking water standards. Radium reduction through various means (e.g., by water softening) has been accomplished already by several communities in this region. The lack of adequate treatment of some community water supplies has been the result of a lack of funds rather than the lack of adequate treatment technology.

1382.06

See Comment Response 1275.12.

1382.07

See Comment Response 18.03.

1382.08

See Comment Responses 533.03 (water supply) and 1381.11 (water quality).

1383.01

The information supplied in the comment has been used to revise the database and impact assessment of Volume I, Chapter 5, Section 5.1.5.2.G, and Volume IV, Appendix 11.

1384.01

Comments noted.

1385.01

Comment noted.

1386.01

Comment noted.

1387.01

Comments noted.

1388.01

Comments noted.

1389.01

Comment noted.

1390.01

Comments noted.

1390.02

The North Carolina proposal was judged by the DOE to meet the BQL qualification requirements of the ISP (ISP Section 3.0).

Local opposition and support will be considered in the site selection decision as described in the ISP (ISP Section 3.3.2.4). The substantial comments submitted by the commenter were considered by the DOE Site Task Force in evaluating the seven site alternatives. However, the focus of this EIS is upon evaluation of environmental impacts of siting and operating the SSC at each of the site alternatives.

1390.03

Comment noted.

1390.04

See Comment Response 708.03.

1390.05

See Comment Response 732.07.

1390.06

Comment noted.

1390.07

The discussions in several sections of the EIS on the impacts related to administrative (land acquisition) or safety-related (nearness to tunnel or other SSC facilities) loss of water wells have been revised to provide a more consistent and clear assessment of the potential for loss of water wells at each site.

To assure safety, it is likely that a 150-ft radius around the tunnel will be established within which no water wells, existing or new, will be allowed. A 1,000 ft-wide restricted zone along the tunnel (500 ft on each side) is anticipated. This zone is established for control of construction activities, however, and wells within it would not be required to be closed. Replacement of wells within this zone may be limited due to the vibrations from drilling. However, this would likely be dictated by site-specific conditions or timing of the drilling and is not excluded. Existing wells on fee simple land for the project would likely have to be abandoned but, this is not assured in all cases.

State records of water wells were available for the EIS but in most cases it was indicated by the states that the records were not up to date. Limited field survey information was available, and therefore it was assumed that the well data were not detailed enough to develop an accurate count of the wells that fell within the specific total restriction areas identified above. Given these limitations, the intent of the presentation was only to identify the approximate number of wells within the footprint of the SSC and provide a general comparison of the relative density of water wells near the individual state sites. The number of wells which might be hydrologically impacted by SSC activities (water level declines or possible water quality changes) also cannot be accurately estimated with the available well records and the lack of final siting and design information. Both of these issues (well closures due to land acquisition and proximity to facilities and wells hydrologically impacted) will be addressed in detail in the Supplemental EIS to be prepared for the selected site.

See revised EIS sections Volume I, Chapter 1, Table 1-1; Volume I, Chapter 3, Table 3-7; Volume I, Chapter 5, Section 5.4 and Table 5.6-3; and Volume IV, Appendix 7, Sections 7.2.3.1.A.6 through 7.2.3.7.A.6. The figures showing the location of wells have been deleted from the EIS.

To reflect the apparent general lack of completeness in well records, the North Carolina discussion now indicates that there may be in excess of 300 wells within the SSC footprint and also notes the States estimate that only about nine wells may be directly affected and required to be abandoned by the project. If the North Carolina site is selected, detailed field surveys will be performed to accurately determine the number and location of all existing water wells within the footprint and the number that would be required to be abandoned.

1390.08

See Comment Responses 13.02 and 710.01.

1390.09

Utilization of existing sewage treatment plants including Eno Wastewater Treatment Plant, in Durham and other municipalities is only one of the alternatives considered in the EIS. If treatment capacity of existing plants is not adequate to support the SSC, package treatment plants could be installed. Further detailed discussion of available alternatives is presented in EIS Volume IV, Appendix 7, Section 7.1.3.5.F.

Water requirements for the SSC project and additional off-site domestic use can be met by existing reservoirs in the project vicinity, which have adequate excess capacities, as discussed in revised EIS Volume I, Chapter 5, Section 5.1.2.4 and Volume IV, Appendix 7, Section 7.1.3.5.G. The safe reservoir yields used in the evaluation were estimated for 20-yr drought conditions, i.e., a drought with an average recurrence interval of 20 yr. The safe yields for a more severe drought would be less, but such yield data are not currently available (Lake Michie would not be used to supply the SSC project, but was considered for partially meeting the additional off-site domestic demand).

See also revised Volume I, Tables 1-1, 3-3, and 3-7, and Section 3.7.3.

1390.10

See Comment Response 1514.12, first paragraph.

See Comment Responses 1513.03 and 13.02, second paragraph.

See Comment Response 1513.64, third paragraph.

1390.11

The main factors that trigger in-migration into each region of influence (ROI) were unemployment rates and the overall size of the existing labor force. If each of these measures was relatively low, as in the North Carolina ROI, then in-migration into the region would be relatively high. In the North Carolina ROI some direct jobs and most secondary jobs would, however, be filled by local residents. During peak construction in 1991, in-migrants to the region are expected to obtain nearly 5,000 jobs. Nearly as many jobs, approximately 4,600, are expected to go to local residents. During operations, beginning in the year 2000, approximately 3,490 jobs would be obtained by in-migrants to the region, and about 2,910 jobs would be taken by local residents. The commenter's assertion that the North Carolina ROI would have the greatest amount of in-migration of the seven sites under consideration is correct for the construction period. However, the Tennessee region

would experience slightly greater in-migration during operations (see Volume I, Chapter 5, Table 5.1.8-4). The socioeconomic effects of this in-migration are discussed in EIS Volume IV, Appendix 14, Section 14.1.3.5.

1390.12

See Comment Response 1514.16.

1390.13

The DOE does not accept title to land if encumbered by subdivision restriction. The State of North Carolina would be responsible for resolving such title objections. See Comment Responses 710.01 and 880.04.

1390.14

The State proposers are responsible for the strategies, commitments, and siting reflected in the proposals. EIS Volume I, Chapter 3 presents a comparative analysis of impacts. A more detailed discussion of referenced problems in North Carolina is found in EIS Volume IV, Appendices 7,10, and 14.

1390.15

See Comment Responses 13.02 and 710.01.

1390.16

Comment noted.

1390.17

Responses to the commenter's concerns are as follows:

The DOE believes that the hearing on the EIS in North Carolina was conducted in full compliance with NEPA regulations (40 CFR 1500-1508). The DOE has made substantial effort to involve the public in the NEPA process. The Federal Register notice indicated that registration would be taken not only in advance, but also at the door before and during the meetings. While DOE regrets that people may have been inadvertently denied the opportunity to register over the telephone between the time advance registration lists were filled and a second day was scheduled, nevertheless those people had the opportunity to take advantage of walk-in registration, and in fact, everyone in attendance who wanted to speak had the opportunity. While a daytime meeting may not have been convenient, such scheduling was necessary. Moreover, public hearings have been only one means for providing input into the process; written comments, for example, carry as much weight in the NEPA process as comments made at public hearings.

See Comment Response 0013.02 regarding concerns about data accuracy.

The nature and purpose of the Site Task Force Meeting with Duke University was to evaluate regional resources as provided in the Invitation for Site Proposals. This is not consistent with the reasons given for refusing to meet with CATCH.

The purpose and need for the SSC is discussed in EIS Volume I, Chapter 2, Sections 2.1 and 2.2. See Comment Response 0275.03 regarding the proposer's authority for eminent domain.

As part of the proposal, each proposer certified that they could legally deliver clear title to all required lands. See EIS Appendix 4, Land Acquisition Plans.

1390.18

Comment noted.

1390.19

Your comment and survey results have been noted and reviewed and included in EIS Volume II. The DOE has made site visits and conducted public hearings in the vicinity of each of the seven alternative sites. The DOE is aware of the existence of a variety of opinions concerning the potential of siting the SSC in any of the identified areas. The EIS describes the expected impacts of the proposed action at the alternative sites.

Public participation is a vital element in the review of any EIS. The DOE goal for accuracy and comprehensiveness requires the active involvement of the public. In particular, those citizens in the immediate area of a potential siting of a major facility can contribute significantly to the understanding of that area's environment and culture.

All comments, individual or an organized collective expression, are fully assessed and become an official published part of the NEPA-EIS process.

The goal in selecting a site for the SSC is to select a site that will permit the highest level of research productivity and overall effectiveness of the SSC facility at a reasonable cost of construction and operation and with a minimal adverse impact on the environment (EIS Volume III).

1391.01

Comment noted.

1391.02

Scenic and visual resources assessments are provided in EIS Volume I, Chapter 5, Section 5.1.10 and in detail in Volume IV, Appendix 16. The quotation made in the comment is from Volume I, Chapter 5, Appendix 16, Section 5.1.10.3.C and states that in Illinois, the possibility of visual impacts on views from residential areas is particularly great because of the urbanization of much of the project site and vicinity. Nevertheless, there are a number of mitigation measures available to minimize adverse scenic/visual impacts.

Regarding population levels at the Illinois site, see Comment Response 1369.09.

1391.03

See Comment Responses 533.03 and 1013.02.

1391.04

See Comment Response 1122.02 The health impacts from radiation during SSC operations have been assessed in EIS Volume IV, Appendices 10 and 12. There are no measurable adverse impacts from cumulative effects of exposure to radium in drinking water and exposure to radiation from SSC operations. The dose equivalent to the general public from SSC operations is primarily through the air pathway and is less than 0.001 percent of that from background radiation.

1391.05

See Comment Response 876.31 for a discussion of land use patterns and opportunity costs. Comment Response 973.01, paragraphs one and two, provide details on growth in the Region of Influence.

1391.06

The Fermilab would be shut down for a one- to two-year conversion period to connect it to the SSC ring. See Comment Response 1219.03.

1391.07

Comment noted.

1392.01

Each of the proposing states is responsible for all facets of land acquisition for the SSC facility, including providing for the relocation of existing businesses, farms, and residents that would be displaced by SSC development. Until the DOE establishes the final placement of the collider ring and associated facilities, the exact acreages, parcels, and ownership cannot be determined precisely.

An estimate of the market value of real property which would be displaced at each of the seven proposed SSC sites is provided in EIS Volume IV, Appendix 14, Section 14.1.2.3.A, Table 14.1.2-8. Compensation for the real property and relocation expenses would enable private businesses, farms, and residential owners and renters to relocate in the area if they so choose. The EIS assumes that most displaced farms and businesses (such as the AT&T plant in the Illinois Region of Influence [ROI]) would relocate within the ROI where they currently are located -- or if they do not relocate within the region, that the local market would provide the opportunity for expansion to other firms in the ROI. If the Illinois site proposal is accepted by the DOE, a Supplemental EIS could analyze this issue in greater detail.

1392.02

Comment noted.

1393.01

Comment noted.

1393.02

Comments noted.

1393.03

The DOE acknowledges the role of the TVA in the permitting process, if Tennessee were the selected site.

1393.04

Comment noted.

1394.01

See Comment Response 1279.283.

1394.02

See Comment Response 1279.284.

1394.03

See Comment Responses 1279.284 and 1279.285.

1394.04

See Comment Responses 1279.284 and 1279.286.

1394.05

See Comment Response 1279.287.

1394.06

See Comment Response 1279.288.

1394.07

See Comment Response 1279.289.

1394.08

See Comment Responses 1279.284 and 1279.290

1394.09

See Comment Response 1279.291.

1395.01

See Comment Response 873.02.

1395.02

Comment noted.

1396.01

EIS Volume I, Chapter 4, Tables 4-8 and 4-9, gave statistics pertaining to radon levels present in living spaces and in basements in the regions of the proposed sites. Radon information was based on the data collected by the University of Pittsburgh Radon Project, and its successor, The Radon Project. As it was discussed in detail in Table 5.3.6-1, Appendix 5, Volume IV for the Illinois site, these data include 434 living space measurements and 322 basement measurements in DuPage County, and 13 living space measurements and 7 basement measurements in Kendall County. In addition to these data, 31 first-floor and 134 basement measurements in DuPage County, 2 first-floor and 26 basement measurements in Kendall County, and 12 first-floor and 59 basement measurements in Kane County were summarized from a publication prepared by Mr. Gilkeson, who cited John Cooper's data.

There were only 26 basements tested in Kendall County. Although 65 percent of the 26 basements tested had radon levels between 4 and 20 pCi/l, the results should not be interpreted as representative for Kendall County. The sample size was too small to draw any statistically significant conclusion. Nevertheless, the construction and operation of SSC would not have any cumulative impact on the existing condition. It would not increase the radon level in any residences in Kendall County.

1396.02

See Comment Response 533.03.

1396.03

Comment noted.

1397.01

See Comment Response 1275.01 in regard to cost savings associated with Fermilab.

1398.01

Volume I, Chapter 4, Table 4-17 has been revised to report the dwarf wedge mussel as a C2 candidate species (still under review). The dwarf wedge mussel may become a listed species during the life of the SSC project. Therefore, the DOE would continually review the status of this and all other candidate species potentially present at the selected site. Additional site-specific surveys would be conducted to confirm the presence or absence of any listed or candidate species. An evaluation would be made of potential impacts, and project design or operations could be modified, if necessary, to avoid or mitigate adverse effects. This evaluation would be reported in the Supplemental EIS.

1399.01

See Comment Responses 860.07 and 1146.04.

1399.02

See Comment Response 979.02 regarding the number of wells which may be closed at the Illinois site and Comment Response 870.04 regarding elevated levels of radium in groundwater.

The state has indicated that it will provide an alternative water supply source to replace any well closed or lost due to the SSC.

1399.03

See Comment Response 816.01.

1400.01

See Comment Responses 710.01 and 880.04.

1400.02

See Comment Response 880.04.

1400.03

See Comment Response 710.01. EIS Volume IV, Appendix 14, Sections 14.1.3.3.A and E, provide a discussion of business relocations and potential impacts on employment.

1400.04

As noted in EIS Volume I, Chapter 3, Section 3.4, Illinois would need to acquire the most parcels of any of the seven BQL sites. The proposed project schedule (EIS Volume IV, Appendix 1, Section 1.1.4) would require Illinois to provide access agreements to the DOE by January, 1989 to allow performance of preconstruction activities, including geotechnical verification and resource assessments. Furthermore, the actual construction schedule is predicated on the land acquisition sequence from March, 1990 to January, 1991 agreed to by the proposing state. Failure of the State to meet the land acquisition schedule would most probably result in construction delays. Also see Comment Response 880.04.

1400.05

See Comment Response 1381.08.

1400.06

See Comment Response 922.11.

1401.01

See Comment Responses 875.01 and 710.01.

1401.02

See Comment Responses 710.01 and 830.04.

1401.03

See Comment Response 880.04.

1401.04

See Comment Responses 710.01 and 880.04.

1401.05

The DOE has made an effort to notify persons who may be affected by the SSC. See EIS, Volume I ("Foreword") and the EIS, Volume I, Chapter 3 for a discussion of EIS availability through distribution and at libraries and reading rooms throughout the country.

See also Comment Response 880.04.

1401.06

See Comment Responses 710.01 and 880.04.

1401.07

See Comment Response 880.04.

1402.01

Comment noted.

1402.02

For a discussion of the selection process and criteria see EIS, Volume III, Chapters 1-3. Also see Comment Response 1126.05.

1402.03

Regarding SSC-related effects on the quality of life in local communities, see Comment Response 1002.01.

1402.04

The radiological impact of the SSC can be predicted with reasonable confidence based on the operating experience of existing high energy accelerators (Fermilab in Illinois and CERN in Europe). (See EIS Volume IV, Appendix 12, Section 12.2.1.1.) See Comment Response 810.05 for a detailed explanation of the degree of accuracy with which radiological impacts can be predicted.

1402.05

Drinking water pathways are discussed in detail in EIS Volume IV, Appendices 10 and 12. Source terms, assumptions, and models used in the calculations of the potential exposure from aquatic pathways to residents are discussed and presented in a systematic manner in those appendices. The calculations are based on the migration of radionuclides Na-22 and tritium in groundwater resulting from the activation of constituents by a beam loss. Results show that the groundwater from wells at 50 meters from the activation point of all candidate sites are below U.S. Environmental Protection Agency (EPA) standards for community drinking water. The highest value for Na-22 at the wells is 0.06 pCi/ml; the highest value for tritium is 0.35 pCi/ml (see Volume IV, Appendix 12, Table 12.2.3-5). The EPA standards are 0.5 pCi/ml for Na-22 and 20 pCi/ml for tritium.

1402.06

Sludge removal at the Byron Plant is not affected by the SSC project and is not the responsibility of the DOE. Secondary impacts of the SSC on utilities are discussed on the EIS in Volume I, Chapter 5, Section 5.2.

The SSC will operate on the precedent set by Fermilab for sound environmental management practices. It is anticipated that there will be periodic sampling (as necessary) of sludge and other nonradioactive waste streams for potential radioactive contamination. Sampling and analysis would be done in accordance with applicable EPA-approved procedures. However, the environmental monitoring/waste management program will be the responsibility of the management and operations contractor which the DOE is in the process of selecting. Prior to startup, the M&O contractor will be subjected to an operational readiness review at which time their definitive plans for operation must be submitted to the DOE for review and approval. It is at this time that the detailed environmental/waste management program will be finalized. If contamination is detected, the waste stream will be treated, packaged, and transported for disposal in accordance with applicable regulations (e.g., low level radioactive waste will be shipped to an approved low level radioactive waste disposal site; see Comment Response 276.03), and waste free from radioactive contamination will be disposed of in an approved landfill or treated with an appropriate treatment technology (see EIS Volume IV, Appendix 12).

1402.07

See Comment Response 864.01.

1402.08

The use of new "warm" superconducting materials for the SSC is discussed in Volume I, Chapter 3, Sections 3.2.2.3 and 3.2.4.3 The discussion there applies equally to upgrading the existing Fermilab accelerator through the use of warm superconductors.

1402.09

See Comment Response 1223.03

1402.10

Comment noted.

1403.01

See Comment Response 860.04.

1403.02

EIS Volume I, Chapter 1, states that the basic purpose of the SSC is to gain a better understanding of the fundamental structure of matter. Current plans do not include the application of the SSC to defense programs, and there is no foreseeable way that it could be of immediate use to such programs.

1403.03

The operations of the SSC would not significantly degrade environmental quality at any of the seven site alternatives. The operations will be conducted in compliance with applicable environmental regulations (see Volume I, Chapter 6). A summary of impacts of construction and operations is given in Volume I, Chapter 3, Section 3.4. Cumulative effects are summarized in Volume I, Chapter 3, Section 3.5. The impacts associated with the SSC will be largely experienced during construction; operations will result in minimal additional impacts.

The operations impacts on environmental quality are detailed in Volume IV, Appendix 7 (water), Appendix 8 (air quality), Appendix 9 (noise), Appendix 11 (ecology), and Appendix 12 (health and safety). These are summarized in Volume I, Chapter 5, Section 5.1.

1403.04

Comment noted.

1404.01

Comment noted.

1404.02

See Comment Response 1133.02.

1404.03

See Comment Response 979.02.

1404.04

The determination of whether the SSC provides an overall "positive" or "negative" effect on an economy is the result of a subjective evaluation. The EIS analysis was intended to provide the reader with essential information upon which to base such a determination. Estimates of the economic impact to the Illinois region of influence and the primary impact counties of DuPage, Kendall, and Kane are presented in EIS Volume I, Chapter 4 and Volume IV, Appendix 14, Section 14.1.3.3.

1404.05

Comment noted.

1405.01

Comment noted.

1405.02

Although the SSC is an experimental facility, it is possible to project the environmental safety and health implications based on existing accelerator performance data (EIS Volume IV, Appendix 10) and existing knowledge of cosmic rays, some of which have energies far exceeding 40 TeV. In fact, the projected radiation dose to humans and the safety of the facility are well understood. For a more detailed description of the health risks from SSC operations, see Comment Response 810.05 and EIS Volume I, Chapter 5, Section 5.1.5.1.A, and Volume IV, Appendices 10 and 12.

1406.01

Comments noted.

1407.01

It is DOE policy that Fermilab would continue to be supported if the SSC were at some other location. If the Illinois site is chosen, the experience is that the presence of a large construction project at an existing laboratory does not necessarily impact the ongoing program adversely. See Comment Response 0864.01.

14011450335884

1408.01

Comment noted.

1409.01

Comment noted.

1410.01

Regarding the potential for contamination of shallow groundwater, see Comment Response 284.02. Regarding the potential for well loss or closure, see Comment Response 810.03.

1410.02

See Comment Response 1229.02.

1410.03

Approximately 319 acres of wetlands are in the fee simple areas associated with the planned surface facilities at the Michigan site (see EIS Volume IV, Appendix 11, Section 11.3.4.3). Of this total, approximately 190 acres could be impacted from surface facility construction if no mitigation measures are implemented. With mitigation, impacts to wetlands would be much less than stated in the EIS. A number of mitigation alternatives (such as wetlands avoidance) are possible (see EIS Volume IV, Appendix 11, Section 11.3.4.3). However, pending final site selection, facility design, and facility location, it is not possible in this EIS to provide detailed mitigation plans. If Michigan is the selected site for the SSC, site-specific mitigation plans would be developed in accordance with appropriate Federal and/or State agencies (e.g., COE, USFWS, MDNR), and these would be included in the site-specific Supplemental EIS.

EIS Volume IV, Appendix 4, Section 4.4 provides data on the number of relocations. Given the proposed layout, this amounts to 221 relocations. See Comment Response 880.04 for a discussion of land acquisition plans. Comment Response 312.06 discusses the effects of the SSC project on land values.

1411.01

See Comment Response 500.03.

1411.02

It does not necessarily follow that any endemic species would be threatened or endangered should the SSC be built at the proposed Tennessee site. Mitigation actions such as maintaining water quality would reduce the impacts.

1411.03

Rem is a special unit of dose equivalent. The dose equivalent in rems is numerically equal to the Radiation Absorbed Dose (RAD) multiplied by the quality factor, the distribution factor, and other necessary modifying factors. A rem is a measurement of damage in a biological system resulting from different types of ionizing radiations. Millirem (mrem) is a submultiple of the rem equal to 1/1000 rem (see Volume IV, Appendix 10).

Dose-effect relationships in humans for whole-body irradiation are listed below (National Council on Radiation Protection and Measurements Report No. 39, "Basic Radiation Protection Criteria," 1980):

300,000 mrem - median lethal dose for single short exposure.

150,000-200,000 mrem - short-term dose likely to produce short-term disability.

75,000-125,000 mrem - lowest short-term dose likely to produce vomiting in about 10% of the people so exposed.

50,000-75,000 mrem - lowest short-term dose detectable in a specific individual.

5,000-25,000 mrem - lowest dose detectable.

The average American's annual average exposure to all sources of radiation results in a dose equivalent average of 360 mrem, of which approximately 300 mrem/yr comes from nature. Approximately 55 percent of the 360 mrem/yr is from inhalation of naturally occurring radon and its progeny. Another 27 percent comes from cosmic radiation from outer space, terrestrial radiation from rocks and soil, and internal radiation from the human body. The remaining 18 percent is from man-made sources, such as medical procedures (Volume IV, Appendix 12). EIS Table 12.2.1-1 of Volume IV, Appendix 12 presents the average annual effective dose equivalent in the population of the United States. In the Illinois proposed SSC region, the natural background radiation accounts for 401 mrem/year.

The total radiation exposure received by the general public from operations of the SSC will be about 0.004 mrem/yr, which is less than 1/1000 of 1 percent of the background (EIS Volume I, Chapter 5, Section 5.1.6). This trivial dose results from all exposures including tritium. A thorough assessment on the potential health impact is provided in Volume IV, Appendices 10 and 12. The potential health impact from tritium (H-3) in groundwater is addressed in Volume IV, Appendix 12.

1411.04

See Comment Response 871.01

1412.01

Comment noted.

14011450335886

1412.02

The student/teacher ratio and "level of service" indicators used to analyze local public services are simply ratios of jobs in particular sectors (school instruction and all education-related jobs) to the total population served (school enrollment and regional population). The concept of these ratios does not denote numerical rankings of the levels of service provided. However, the measures are useful indicators of the degree to which regional population changes would affect the need for local services; they do not necessarily reveal information about the quality of the services offered.

Therefore, although student/teacher ratios may be on average higher, and full-time equivalent (FTE) employment per 1,000 population in general education lower, in the Michigan Region of Influence than in the other regions proposed for SSC development, these statistics do not imply that the quality of education offered in the Michigan Region of Influence is inferior to the education offered in those other regions.

1412.03

Health and safety issues regarding the SSC are discussed in EIS Volume IV, Appendix 12 and are summarized in Volume I, Chapter 5.

1412.04

Comment noted.

1413.01

Comment noted.

1414.01

Comment noted.

1414.02

See Comment Response 402.01.

1414.03

It is possible that a few wells within the path of the collider tunnel will have to be abandoned; the exact number of wells affected cannot be determined until the final design of the SSC is fixed. Also, for those access shafts that are sunk through the alluvial aquifers, some localized and temporary impacts to well levels may be experienced. For persons who will be affected by loss or disruption of water supplies, alternative supplies and/or compensation will be provided.

For discussion of the completeness and accuracy of geologic information used in the EIS, see Comment Responses 217.01, 217.03, and 1559.02.

14011450335887

1415.01

Comment noted.

1415.02

If Arizona is selected as the site for the SSC, (Volume IV, Appendix 5, Section 5.1.9), some losses of desert habitat and other ecosystem impacts in the project areas would occur. Also, as the State of Arizona's proposal suggests, the SSC could be incorporated into a variety of habitat restoration and preservation activities. However, additional environmental studies and plans for mitigating impacts would be made during preparation of a site-specific Supplemental EIS.

1416.01

The earthquake potential and earthquake history of the Michigan site are discussed in Volume IV, Appendix 5, Section 5.4.1.5 of the EIS. The site area is characterized by infrequent small- to moderate-sized earthquakes with only minor potential to damage structures. While earthquakes of this size occasionally cause minor damage to homes and older structures, the potential for significant damage to a major structure that has been designed to up-to-date seismic-reinforcement codes is exceedingly small. The SSC would be designed and built to withstand reasonably expectable earthquake vibrations (i.e. generally equivalent to the largest earthquake that has occurred in the region).

1416.02

Comments noted.

1417.01

Comment noted.

1417.02

The DOE will comply with the Endangered Species Act. Consultation with the USFWS was done at all site alternatives and some field surveys conducted. Should Michigan be selected as the SSC site, further detailed surveys done in support of the site-specific Supplemental EIS would address the issue of the "one of a kind" flock of birds that the commenter reports has been observed over parcel H2-I3.

1417.03

No wetlands associated with the Grand River are located in areas expected to be impacted by surface facility construction. The E3 site is the nearest surface facility to any Grand River wetlands along Lansing Avenue. This facility has no wetlands within or adjacent to its boundaries. Thus, construction at this location should have no impact on

wetlands in the vicinity of the Grand River. In the vicinity of Lansing Avenue, the collider ring would pass beneath the Grand River and its wetlands. However, because of the low rates of groundwater seepage anticipated and planned groundwater inflow control measures (see EIS Volume IV, Appendix 10, Section 10.2.3.4), dewatering of wetlands during tunnel and shaft construction is not expected to occur.

1417.04

Access roads to the different facilities will be constructed where required (EIS Volume IV, Appendix 14, Section 14.2.1.3.D.1.a.2).

Until the DOE agrees to a final placement and design of the SSC, the exact location of surface facilities and associated access roads will not be known. The EIS is based upon the proposer's adaptations of a conceptual design (see SSC Central Design Group: Conceptual Design of the Superconducting Super Collider SSC-SR-2020 Berkeley, CA: UDA, March, 1986) which represents a reasonably accurate picture of conditions likely to occur if the site is selected for the SSC. Access roads will be addressed in greater detail in the Supplemental EIS for the selected site. The secondary impacts are discussed in EIS Volume I, Chapter 5, Section 5.2.

1417.05

A few wells may have to be abandoned due to their proximity to the project. A few others may be affected in terms of increased drawdown because of their vicinity to excavations during construction or to wells supplying water to the SSC and the projected increase in population. These drawdowns will be temporary, resulting from excavation (including tunnel), infiltration and dewatering, or long-term resulting from project water use during construction and operations. Surface activities, including soil disturbance, construction spills, disposal of water from excavations, and spoil leachates, are projected to have negligible effects on shallow groundwater quality. According to the State of Michigan proposal, the tunnel would be at depths ranging from about 80 to 250 ft; groundwater will be flowing into rather than out of the tunnel, thus contaminants from the tunnel construction infiltrating into the groundwater will be negligible. Radiological effects from the SSC will also be negligible. The radiation emitted during normal operations is very low, and the occurrence of a beam loss with potentially higher radiation releases is highly unlikely. Even for that latter case, the radiation reaching groundwater wells would be low and meet regulatory standards. Impacts on specific wells cannot be assessed until a final design for the project has been developed. These assessments will be performed and documented in a Supplemental EIS for the selected site. See Comment Response 810.03 with regard to restrictions and potential compensation for affected well owners. See EIS Volume IV, Appendix 7, Section 7.2.3.4 for details on groundwater impacts, and Volume IV, Appendix 12, Section 12.3.1 and 12.4.1 for details on radiological impacts.

1417.06

See Comment Responses 710.01 and 880.04. If a residence is designated to be required in a fee simple estate, the minimum Federal acquisition requirements which all proposers have agreed to comply with as a minimum would require the appraisal process to include the value of the residence based on the construction in place.

1417.07

See Comment Response 880.04.

The DOE does not anticipate the use of restrictive easements on property where a stratified fee estate exists. This includes access to minerals or wells provided that there is no penetration of the DOE's stratified fee estate without prior DOE written approval. The "rights and privileges" of affected residents under a stratified fee estate are discussed in Volume IV, Appendix 4, Section 4.2.1.2. In fee simple areas the state strategy on acquisition will regulate.

1417.08

Comment noted.

1417.09

Comment noted.

1417.10

See Comment Response 880.04.

1417.11

See Comment Responses 880.04 and 1259.02.

1417.12

The statements made by the State referred to in the comment are not the responsibility of the DOE. See Volume III, Chapter 3, for a discussion of the DOE's site-selection process. The secondary impact resulting from the State's development of infrastructure are discussed on the EIS in Volume I, Chapter 5, Section 5.2.

1417.13

The health and safety risks due to operations of the SSC can be projected with great confidence based on operating experience from similar high energy physics accelerators in the United States and Europe (see Comment Response 810.05). All seven candidate sites are below applicable Federal, State, and local standards for exposures to radiation attributed to operation of the SSC. As shown in Volume I, Chapter 5, any calculated exposures to the maximally exposed individual on the

ground surface would be no more than 0.0023 mrem/yr under normal operations. This level would be attributed to airborne exposure to activation products during venting of the tunnel and would require continuous exposure at that location for one year (see Volume I, Chapter 5). This level is a small fraction (less than 1/1000) of the natural background radiation levels in Michigan and is well within the current DOE guideline of 100 mrem/yr for a maximally exposed individual who could be affected by DOE activities.

1417.14

Comment noted.

1418.01

The site location for the SSC was chosen by the proposing State. As stated on the Cover Sheet of the EIS, the proposed action for the EIS is to select the site for the SSC, the largest scientific instrument ever built. The Secretary of Energy has identified the preferred site using technical evaluation criteria and cost considerations. In order of relative importance, the technical evaluation criteria are geology and tunneling, regional resources, environment, setting, regional conditions, and utilities. Also see Comment Responses 880.04 and 1126.05.

1418.02

See Comment Responses 873.02 and 1126.05.

1418.03

See Comment Response 1126.05.

1418.04

Comments noted.

1419.01

Comments noted.

1420.01

Comment noted.

1420.02

The new east-west highway (State Highway 7) is discussed in Volume IV, Appendix 14, Section 14.2.1.3.B. The highway was proposed by the State of Colorado to provide better access to the site. The road would be designed and constructed to Colorado Department of Highways specifications. It is recognized that the traffic would get worse and that

passengers could be stranded during severe weather conditions. State and local emergency and law enforcement agencies would be responsible for aiding stranded motorists during severe weather conditions.

1420.03

As indicated in the EIS, the preferred method for obtaining both groundwater and surface water for the SSC at the Colorado site is through purchase of existing water rights. This approach is taken to minimize the impacts to the area's available water resources. Water rights would be purchased only from organizations or individuals who indicate a willingness to sell or who have no need for all or a portion of their permitted right. Given the planned process, there would be no forced returns to dry land farming.

1420.04

The new Denver regional airport is addressed in Volume IV, Appendix 5, Section 5.2.11.2.A.3 and Volume IV, Appendix 14, Section 14.2.1.3.B.3. The new airport will not be completed in 1992 during the peak construction year. Therefore, the assessment of impacts during construction is based on the use of the Denver Stapleton International Airport. However, the airport will be available during operations due to its scheduled completion date of 1995. Therefore, the assessment of impacts during operations are based on the use of the new airport.

1420.05

Sources of aggregate for Colorado are discussed in Volume IV, Appendix 5, Section 5.2.1.6.A. The cost of aggregate in the Denver area was taken into account when the construction costs were indexed to the Denver area. Also see Comment Response 577.02.

1420.06

Comment noted.

1421.01

Comment noted.

1422.01

Comment noted.

1423.01

Fermilab is operated for the DOE by Universities Research Association (URA) which is a group of North American Universities (mostly U.S.). URA is not connected with any Michigan-based power plant. The DOE has no knowledge of any petition to terminate the operation of Fermilab.

The DOE also has no knowledge of a 102-mi project that was stopped because of "unknown reactions." The SSC is not a military or military-backed project. The SSC will have no known military application (see EIS Volume I, Chapter 2, Purpose and Need for Action).

1424.01

Comments noted.

1425.01

Comments noted.

1426.01

Comments noted.

1427.01

Comment noted.

1428.01

See Comment Response 865.01.

1428.02

See Comment Response 1259.02.

1428.03

See Comment Response 1126.05.

1429.01

See Comment Response 1217.01.

1429.02

See Comment Response 1279.141.

1429.03

See Comment Response 1279.141.

1429.04

The EIS recognizes the potential impacts of groundwater infiltration into excavations and of the increased groundwater use due to the project. These aspects, including the incremental drawdown of water tables and the resulting impacts on water supplies, will be considered

among other factors in selecting the site. See Comment Responses 19.03 (infiltration into excavations) and 533.03 (groundwater drawdown and supply).

1430.01

Comments noted.

1431.01

Comments noted.

1431.02

This EIS analyzes the environmental impacts projected to occur if the SSC were to be sited at one of seven site alternatives. Power supply sources for the SSC and the impacts of their existence are the responsibility of the entity providing the power. All ten commercial nuclear power reactors and the General Electric Morris Operation are located at least 25 mi away from the Illinois proposed region of the SSC. Although these nuclear facilities may release radioactive materials to the atmosphere during their normal operations, the distance from the proposed SSC site precludes any significant contribution to background radiation levels at the proposed SSC site. Based on the available environmental monitoring data, these facilities do not have an impact on the proposed SSC construction or operations.

Further information in regards to the environmental impacts from nuclear facilities is available from the Illinois Department of Nuclear Safety, 1035 Outer Park Drive, Springfield, Illinois.

The SSC is projected to generate 8,000 ft^3 and 10 Ci of low-level radioactive waste (LLRW) per year. This is approximately 4 percent of the 227,084 ft^3 and 0.02 percent of the activity of LLRW shipped from Illinois to a commercial low-level waste facility in 1986. This amount of LLRW may be further reduced with implementation of a waste minimization program as is directed by DOE Order 5820.2A Radioactive Waste Management. Such a waste minimization program initiated at Fermilab in 1987 resulted in a volume reduction in LLRW by a factor of approximately 20 (Volume IV, Appendix 10, Section 10.1.3.2).

1431.03

Regarding the loss of wells, see Comment Response 979.02.

The FEIS recognizes that the project would cause an incremental increase to the groundwater overdraft at the Illinois site. Since this effect would occur during average water years, it would be more pronounced during periods of droughts. Groundwater impacts and potential mitigation are assessed in Volume IV, Section 7, Section 7.2.3.3. See also Comment Response 533.03.

1431.04

The claimed leakage rate of 90 gallons per acre per day in the comment cannot be verified. EIS, Volume IV, Appendix 7, Section 7.2.3.3.B.2 states that negligible amounts of local groundwater quality degradation is anticipated from handling and disposal of sewage and cooling tower blowdown. This section also states that "chemicals and any other materials with significant contamination potential...would be strictly controlled."

Treatment and disposal of hazardous materials is covered in EIS, Volume IV, Appendix 10, Sections 10.1.3.1.D.3 and 10.1.3.1.D.4.

1432.01

Comments noted.

1433.01

See Comment Response 1276.01.

1434.01

Comment noted.

1435.01

Comment noted.

1435.02

The unknown factors concerning radiation and water contamination associated with the SSC are limited and to account for uncertainties in the analyses of potential health impacts, worst-case assumptions were made. The Chapter 5 (Section 5.1.6) of the EIS identified the possible health hazards and impacts. An important conclusion of the assessment is that no adverse impacts to the public are expected during normal operations nor during the unlikely event of an accident.

1435.03

The Soil Conservation Service estimates 4,000 acres of prime farmland in the fee simple area of the SSC project. Information on important farmland was not provided; an estimate was calculated at 1,839 acres using soil maps available for two-thirds of the counties affected. Based on this rough calculation, an estimated 606 acres of prime and important farmland would be permanently converted by the project.

This acreage represents less than one percent of Tennessee's prime farmland inventory, and is well below the annual average of such lands taken out of production as a result of urban development.

1435.04

See Comment Responses 873.02, 880.04, and 710.01.

1436.01

See Comment Response 1126.05.

1436.02

The numbers of people in the areas of possible noise impact have been determined by analysis of aerial photographs. The numbers have been used in estimating the magnitude of expected noise impact associated with each construction and operations noise source. The results for Michigan are summarized as follows:

During construction the number of people exposed to outdoor noise levels greater than 70 dBA (L_{dn}), i.e., those who are within 630 ft of the center of an E or F area, is estimated to be 62. During this period, the number of people experiencing levels between 60 dBA and 70 dBA (L_{dn}) is estimated to be 408. EIS Volume IV, Appendix 9, Table 9-12 shows how these are distributed according to proximity to E and F sites.

During operations of the SSC, the number of people experiencing outdoor levels in the range of 55 dBA to 60 dBA (L_{dn}) is estimated to be 24. These people would be those who live within 700 ft of the center of a service area.

Because the sound level associated with each source falls off rapidly as the distance from the source increases, the number of people highly annoyed by the sounds of SSC construction and operations will not be the same as the population of the region. From a subjective standpoint, assuming an existing background sound level of 40 dBA L_{dn} at distances greater than 6,000 ft from construction sites, specific construction sounds may be identifiable in the normal background, but will not be any louder than the background. As one approaches the construction noise activities the associated sounds become increasingly dominant. Within 3,000 ft, the construction related sound may completely mask all but the loudest native sounds. At this point the daytime sound level may reach 50 dBA, comparable to the level normal conversation heard at a distance of 12 ft (Table 9-1).

See Comment Responses 553.01 and 810.03.

1437.01

Assessment of alternatives to the SSC's proposal location include the other 6 alternative site. However, flexibility of the final ring placement would allow some minor adjustments of facilities at the alternative sites.

1438.01

Comments noted.

1439.06

See EIS Volume I, Chapter 2 for a discussion of the purpose and need for the collider. National priorities for expenditures of tax monies are established by Congress and the President. See also Comment Response 627.01.

1439.08

Comment noted.

1440.01

See Comment Responses 1146.03 and 1126.05.

1441.01

The EIS has been forwarded as requested.

1442.01

Detailed responses to the questions raised by the Tennessee Chapter of the Sierra Club are in Comment Responses to Comment No. 1442.

1442.02

Comment Response 497.21 addresses the questions of SSC-related population growth, infrastructure expansion, and funding for infrastructure expansion raised in the present comment.

1442.03

As noted in the third paragraph of Comment Response 497.21, local jurisdictions in Bedford and Rutherford Counties are anticipated to experience net fiscal gains as a result of the SSC-related development (see EIS Volume IV, Appendix 14, Section 14.1.3.6.D, and Errata pertaining to this section). The public finance analysis upon which these conclusions are based included anticipated infrastructure developments that would be required because of the SSC.

With regard to financial obligations of larger government jurisdictions, the Tennessee State government would be responsible for the purchase of the land upon which the facility is sited, and the Federal Government responsible for the construction and operations of the facility.

1442.04

See Comment Response 0627.01. Off-site infrastructure needs identified by the proposer would be the responsibility of the proposer. See EIS Volume III, Chapter 1, Section 1.1. Regarding intergovernmental cooperation between DOE and State and local governments, see Comment Response 384.02.

1442.05

Much of the infrastructure expansion associated with SSC development, which are local/state responsibilities, could be funded by fiscal benefits anticipated to accompany project-related growth (see the third paragraph of Comment Response 497.21). Indeed, the analysis of public finance impacts on cumulative local jurisdictions included anticipated capital expenditures -- such as additional infrastructure -- necessitated by the placement of the SSC at the Tennessee site (EIS Volume IV, Appendix 14, Section 14.1.3.6.D).

The Environmental impact of such infrastructure expansion is a portion of the SSC's cumulative impact, discussed in EIS Volume I, Chapter 5, Section 5.2.

1442.06

The airborne release of activation products was addressed in EIS Volume IV, Appendix 10; and its consequent health impact was assessed in Volume IV, Appendix 12. An environmental monitoring program for radiological hazards will be established prior to operation of the SSC. The DOE will consider programs established at other accelerators, such as Fermilab and CERN, as models. At Fermilab three types of accelerator-related radiation were monitored in 1987: penetrating, airborne, and waterborne. The program, which is required by DOE Order 5480.1A, monitored direct exposures, the airborne radionuclide C-11, and the primary waterborne radionuclide H-3 (tritium). Penetrating radiation was monitored using a mobile environmental radiation laboratory. The program also consisted of 120 fixed detectors with continuous data recording.

The monitoring program anticipated for the SSC will be designed to detect, track, and assess impact from any radiation or radioactive material released from the facilities. The scope of the program will include assessments of on-site and off-site exposures. Environmental monitoring is capable of detecting significantly lower levels than those specified in standards or guidelines. The program envisioned for the SSC will be able to detect radiation/radioactivity prior to its impact on the general public. The specific procedures for continuous monitoring at above-ground locations will be determined by the Management and Operations contractor and by the DOE prior to the conduct of normal operations. Before commissioning the SSC, the DOE will conduct an Operational Readiness Review. One of the topics to be addressed at the Review will be the plans for radiation monitoring in off-site areas near the SSC. See Comment Response 1473.02.

1442.07

The concern about muon exposures to persons residing above the SSC was addressed in the EIS. Exposure levels were presented in EIS Volume IV, Appendix 10 and summarized in Volume I, Chapter 5.

EIS (Volume IV, Appendix 10, Section 10.1.2.3) indicates that an environmental monitoring program to measure muon exposure and profiles is anticipated for the areas around the SSC. Among the techniques to be employed are high-pressure ionization chambers or large volume, ambient-pressure ionization chambers; thermoluminescent dosimeters; and mobile muon telescopes.

At the proposed Tennessee site, the muon dose at the depth of the beam from the beam absorber would be 0.05 mrem/yr and at less than 0.001 mrem/yr (Volume I, Chapter 5, Table 5.1.6-1). These levels of exposure are small given that the background level in Tennessee is approximately 428 mrem/yr (Volume I, Chapter 5, Table 5.1.6-1). Muon exposures at the ground surface are negligible, because muon beams are highly collimated and essentially travel tangentially to the beam in the same plane as the tunnel ring.

Therefore, the highest exposure levels that could occur due to muons would be underground at the depth of the beam. A check has been made of the topography at the controlled area boundaries for all areas (interaction regions, beam absorbers and tunnel) to determine if there might be topographical depressions that would bring the ground surface below tunnel depth (Volume I, Chapter 5, Section 5.1.6.2). These boundaries are defined in Volume IV, Appendix 10, Table 10.1.2-1. The DOE has determined that it would be unlikely that persons could reach the depth of the tunnel facilities, which in Tennessee would range from 250 to 325 ft (Volume IV, Appendix 10, Table 10.1.3-6), without digging or excavating to that depth. Accordingly, the DOE or the State could restrict activities including deep excavations in the narrow regions where muons might penetrate.

There are components and shielding from the Fermilab operations that are stored in the boneyard area for future reuse. A secured and restricted storage area for SSC-related components is anticipated for the SSC. DOE has no plans to permanently store low-level radioactive wastes (LLRW) at the SSC, but like other laboratories and industrial operations, LLRW will be temporarily stored awaiting a full shipment for disposal. Any LLRW at the SSC that is awaiting off-site disposal will be stored in accordance with Federal and State laws, which are written to protect the environment. The location of the secured, limited access storage area will be determined when the final design of the SSC is made. The siting and design will be in accordance with the DOE's policy of as low as reasonably achievable (ALARA). See Comment Response 229.06 for a discussion of the disposal plans for radioactive wastes.

1442.08

There is some potential for release of "unconfined" radionuclides into the soil and rock surrounding the collider tunnel. These radionuclides

are produced by hadrons from beam losses. Beam loss may be a small loss caused by beam/gas interactions or involve the accidental loss of a full beam. The irradiation of a soil block is much higher for a single full beam loss than for 25 years of operations or partial losses from beam gas interactions. Therefore the consequences of a full beam loss were modeled. The radiological impacts from a beam loss are discussed in EIS Volume IV, Appendix 12, Section 12.4.1. At the Tennessee site, the maximum radiation dose to an individual at the land surface above the point of beam loss is projected to be less than 0.001 mrem/yr (see Volume IV, Appendix 12, Table 12.4.1-2). This dose represents a tiny increment of the 100 mrem/yr DOE limit and may be regarded as negligible relative to the 300 mrem/yr received by the average individual from natural sources (see Volume IV, Appendix 12, Table 12.2.1-1). The above considerations would apply equally to other potential receptors near the SSC, such as soil, crops, and surface water supplies.

Potential radiological impacts to groundwater supplies have been considered as well, and are addressed in Volume I, Chapter 5 and Volume IV, Appendix 12. At the Tennessee site, the calculated annual dose equivalents in a nearby well (50 m from source) resulting from an accidental loss of beam would be 0.0098 mrem/yr (see Volume IV, Appendix 12, Table 12.2.3-6). Again, this dose is a very small fraction of the EPA 4 mrem/yr drinking water standard and may be considered insignificant compared to natural background radiation.

Monitoring of unconfined radionuclides will be conducted at the SSC. Groundwater and surface water monitoring will be conducted as it is at Fermilab.

Current plans for disposal of tritiated water at the SSC do not call for direct discharge to local surface water systems. As stated in Volume IV, Appendix 12, Section 12.2.3.1.D.2, tritiated water from closed loop cooling systems could be solidified by mixing with cement, and disposed of as class A, low-level radioactive waste. All liquid radioactive waste will be treated and solidified prior to disposal at an approved low-level radioactive waste facility. The method of solidification will be consistent with the approved technology at the time of generation and processing. This may be a cement mixture, but it may be one of the new generation of solidification media which is being developed.

Practices which have occurred in the past at older facilities should not be compared to operations which will be conducted at the SSC. In the past, disposal techniques were based on older industry practices. Over the years, knowledge has grown of the consequences of some of these practices, which were then discontinued or modified. The DOE is committed to the philosophy of As Low As Reasonably Achievable (ALARA) and to the development and implementation of health and safety practices which protect the general public, the environment, and the worker.

Disposal site options for SSC-generated, low-level radioactive waste are discussed in Comment Response 229.06.

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Comment Response 1473.02 addresses the impracticality of population monitoring.

1442.09

The release of activation products was addressed in EIS Volume IV, Appendix 10, and its consequent health impact was assessed in Volume IV, Appendix 12. The radionuclides assessed include H-3, Be-7, C-11, N-13, O-15, Cl-39, Ar-41, radon-222 and its short-lived daughters. Most of these radionuclides are in gaseous form, except Be-7, Pb-214, and Bi-214, which are particulates suspended in air. Doses to humans are estimated for total body and various organs, through five exposure pathways, which account for both internal deposition and external exposure. These exposure pathways include:

- Immersion in air containing radionuclides
- Direct exposure from radionuclides deposited on ground surface
- Immersion in water containing radionuclides
- Inhalation of radionuclides
- Ingestion of food produced in the area

Meteorological data, including annual average frequencies of wind direction in 16 compass directions, wind speed, atmospheric stability category, annual rainfall rate, height of atmospheric mixing layer, and annual average temperature, were employed as input data to estimate the annual average concentration of each radionuclide at ground level as a function of direction and distance from the release point. All of the meteorological data were obtained from the weather station in the major metropolitan area nearest the proposed SSC sites.

In the 1986 Fermilab Site Environmental Report, the site boundary concentration was calculated using the computer program AIRDOSE-EPA with neutral wind conditions and average wind speed. The average wind speed used was 10.4 mph. In the air dose estimation for this EIS, wind speed and stability for 16 compass directions were used to simulate realistic conditions.

The AIRDOSE-EPA is used to fulfill the requirements of 40 CFR 61 Subpart H that specified a dose assessment to be done with AIRDOSE or its equivalent computer codes. The assumptions made in the dose estimation are considered to be conservative (i.e., overestimate doses).

The dispersion treatment in AIRDOSE-EPA assumes a continuous plume extending indefinitely outward from the source in a single direction with a single wind speed and atmospheric stability. Fractional contributions to downwind concentrations in each compass direction are based on frequencies of wind and stability category. Realistically, however, wind speed and direction often fluctuate almost continuously, as you suggested. And the atmospheric stability will ultimately change as a plume is blown downwind. Also, deviations from site-specific annual average meteorology can be expected at locations beyond a few miles from the facility site.

1442.1

The locations at which radiological emissions will be released to the atmosphere are at the service area and the interaction hall locations, which are depicted by the letters "F" and "K", respectively. (EIS Volume I, Chapter 3, Figure 3-1).

1442.11

Carbon-11, nitrogen-13, and tritium (H-3, or T) are the products of inelastic collisions between protons and oxygen or nitrogen. They are primarily in a gaseous form in air, which may include CO_2, NO_2, H_2, or HTO (tritiated water).

1442.12

Thermal neutrons are readily absorbed and are not expected to be vented from the tunnel or interaction regions. Thermal neutrons were not reported in air emissions from Fermilab because they were not released in measurable quantities. See Volume IV, Appendix 10 of the EIS for airborne radioactivity release from the SSC.

1442.13

It is not anticipated that a debonding operation will be conducted at the SSC.

1442.14

Water contaminated with tritium will not be treated by evaporating the water into the ambient environment. Tritium will be present in the water from the closed loop cooling system of the beam absorbers, and periodically the water will need to be replaced, requiring disposal of the activated water. Tritiated water will be used as a wetting agent and fixed in a solidification process, possibly with cement, although other matrices will be considered when operations commence. There will be no measurable release of tritium from the solidification process. The solidified material will be disposed off-site at a low-level radiological waste facility (see Comment Response 229.06).

1442.15

See Comment Response 1442.06.

1442.16

The DOE agrees that the best approach to minimizing environmental exposures of the public to radionuclides is to prevent their release to the extent reasonably achievable. DOE's commitment to protecting the public and workers from radiological exposures from its activities is stated in EIS Volume I, Chapter 6 and DOE Order 5480.1B.

1442.17

Muons can be produced directly in proton-nucleus interactions or arise from the decay of pions and kaons in the hadronic cascade. Muons are weakly interacting particles as their interactions are almost wholly due to their charge. Therefore, they are not scattered by nuclear collisions and travel in a straight line producing ions in a small region around their forward direction. Large angles or deflection are caused by nuclear forces, not electromagnetic forces. Muons are unstable and have a very short half-life. They decay to electrons or positrons (beta particles) and neutrinos. Beta particles can be scattered radially from the beam line, but they are stopped in a few inches in material.

A check has been made of the general topography in the areas down line from the beam absorbers and interaction halls and at the footprint of the ring at the proposed sites to determine if there might be topographical depressions that would bring the surface below tunnel depth. There appears to be no area at any of the proposed sites where it would be possible to reach tunnel depth without digging or excavation to that depth (EIS Volume I, Chapter 5, Section 5.1.6.2.A.1). Therefore, because the beam is so focused, it is projected that the dose from muons at the surface would be so low as to not be measurable. The table in EIS Volume I, Chapter 5, Section 5.1.6.2.A.1 has been revised to reflect this assessment.

Environmental measurement of muons have been made at Fermilab up to energies of 1 TeV. The assessments in this EIS were based on conservative computer models as described in EIS Volume IV, Appendix 10, Section 10.1.2.3.A.1.f. During operation, the muon source term would be verified by actual measurements as covered in Section 10.1.2.3.A.1.b.5.

1442.18

The only reason the muon beam would be magnetically deflected is to keep it below the surface of the ground and away from people and structures. Muons interact very weakly with matter but do travel long distances (greater than 1 mi in earth) before dissipating their energy. See Volume IV, Appendix 10, Section 10.1.2.3.A.1.b for more detail on muons.

Based on what is known about the proposed sites, it will not be necessary to deflect the muons. If, however, a situation is found to exist (e.g., the land slopes away from the point of muon generation) that would result in the muon beam travelling above the surface of the earth, the beam would be magnetically deflected to keep it below ground.

1442.19

As indicated in Comment Response 1442.06, a monitoring program will be implemented at the SSC, but it is unlikely that each person residing near the SSC will be individually monitored. DOE will consider programs established at other accelerators, such as Fermilab and CERN, as models

for the program at the SSC. At Fermilab penetrating radiation (such as that from gamma rays and muons) was monitored in 1987 (Fermilab 88/40 1104.100 UC-41, Site Environmental Report for Calendar Year 1987, May 1987, Samuel I. Baker). Penetrating radiation was monitored using a mobile environmental radiation laboratory (MERL). As indicated in the EIS (Volume IV, Appendix 10, Section 10.1.2.3), it is anticipated that there will be environmental monitoring of muons and gamma rays near the SSC. Among the techniques to be employed are high-pressure ionization chambers or large volume, ambient-pressure ionization chambers; thermoluminescent dosimeters; and the use of mobile muon telescopes.

CERN has implemented a program in which monitors have been placed in the homes of workers to monitor natural background radiation. DOE will also consider the use of passive detectors in the homes of workers. A program of this nature at the SSC would permit assessments of radiation exposures to persons residing near the facilities.

1442.20

As mentioned in Comment Response 1442.07, there will be a storage area at the SSC for radioactive equipment and components that are to be reused or disposed. The site for the storage area will be determined during the final design of the SSC. It is anticipated that the storage site will be a secured and limited access area and potential radiation exposures arising from this facility will be maintained as low as reasonably achievable, in accordance with DOE Orders (see EIS Volume I, Chapter 6).

1442.21

The graphite core of the beam absorber is enclosed by two barriers. First, the core is encased in a steel cylinder. Second, the steel cylinder is surrounded by thick concrete walls to exclude groundwater and prevent it from leaching radionuclides from the core.

The graphite core is designed to absorb all of the incident hadrons as well as most of the secondary particles produced (except muons - see below). Tertiary and cascade particles may reach the steel and concrete, but will be stopped there. Muons will continue forward in a very narrow core in the same direction as the proton beam. They will lose energy as they travel through the ground and eventually stop. They will not activate the ground through which they pass.

1442.22

Presumably the "...effluent from the regeneration of the closed circuit cooling system..." referred to in the comment is the cooling tower blowdown. It is presently planned that cooling tower blowdown at the Tennessee site would be treated at existing wastewater treatment plants, following any necessary pretreatment at the SSC facility. (See EIS Volume IV, Appendix 10, Section 10.3.3.3.)

The DOE is committed to operate the SSC and dispose of effluent from the regeneration of the closed circuit cooling system in compliance with applicable statutes and regulations.

1442.23

Water which contains tritium that is above applicable unrestricted release limits will be classified as low-level radioactive waste (LLRW) and will be solidified before shipment to a LLRW disposal facility. This may be by incorporation into cement or other approved media. New and improved techniques for treatment and solidification of LLRW are being developed and these will be evaluated before processing of SSC wastes.

1442.24

According to Karst Hydrology Investigation in the Vicinity of the Campus -- Injector Complex for the Proposed Middle Tennessee Site for the Superconducting Super Collider prepared by Crawford in 1988, karst development is in shallow depths primarily above the Pierce Confining Layer; the elevation of SSC tunnel was chosen by the Tennessee Division of Geology in order to protect the karst features and associated groundwater resources in the Ridley Limestone and avoid problems associated with horizontal tunneling in karstified carbonate rock. Vertical boring would impact the cave system. However, mitigative methods such as relocation and grouting are achievable by existing tunnel boring technology.

The tracer tests performed as part of the karst study indicate that water flow in cave streams could reach high velocities to conduit/channel flows.

The calculation of tritium and Na-22 concentration at hypothetical wells in EIS Volume IV Appendix 12 Section 12.2.3.1c is for assessing the impact of a beam loss accident in the tunnel. The proposed tunnel is at a stratigraphic position below the cave system. Given the available information at the present, it is apparent that groundwater flow from tunnel depth to the cave system is unlikely.

If the Tennessee site is selected, a detailed site-specific investigation and analysis will be prepared for the Supplemental EIS.

In modeling the migration of tritium and Na-22 from a hypothetical beam loss to a hypothetical water well, hydraulic conductivity of rock at tunnel depth was used. For the Tennessee site, the estimate of conductivity is based on packer tests conducted at the field (EIS Volume IV, Appendix 12, Section 12.2.3.1).

1442.25

The "genetic risk (effect/birth)" is the sum of the number of genetic effects per million births to the population exposed to the radiation of all the radionuclides via all the exposure pathway. The genetic effect of radiation is to produce gene mutations and chromosome aberrations. The effect of radiation on the well-being of the future population is a consequence of these changes. Genetic disorders, by definition, do not occur in persons who are exposed to radiation; rather, the effects are seen in their offspring and in later generations to which the altered genetic material is transmitted. Radiation (as well as a variety of chemical agents) can cause various kinds of genetic damage, including polydactyly, achondroplasia, Huntington's chorea, muscular dystrophy, several kinds of anemia, retinoblastoma, Down's syndrome, and many other kinds of physical abnormalities or mental retardation.

In humans, an appreciable number of spontaneous mutations occur even in the absence of special causes. Estimates of genetic damage by radiation can be stated in relative terms, such as the ratio of the induced mutation rate to the spontaneous level. A direct estimate of the first-generation incidence of induced chromosomal aberration and gene mutations from human data, and laboratory mammal experimental data, makes it possible to estimate nearly all expression of first-generation damage from radiation.

1442.26

The highest site boundary dose for SSC were estimated at 110 m (for tunnel shaft) and 150 m (for interaction hall) from the release points respectively (EIS Volume IV, Appendix 12, Section 12.3.1.1). In our air dose estimation, wind speed and stability for 16 compass directions were also used to simulate realistic conditions. The highest individual dose calculated for Tennessee was for a person standing 500 ft north of the service facility vent stack, 24 hours a day, and 365 days a year (EIS Volume IV, Appendix 12, Table 12.3.1-29).

1442.27

As indicated in EIS Volume IV, Appendix 12, radionuclides released into the environment by the SSC are calculated to be far below the maximum permissible doses. It is the DOE's policy to operate its facilities below existing standards or operating guidelines and to reduce releases to as low as reasonably achievable (ALARA). The ALARA principle would be applied to the SSC.

1442.28

Fermilab's recent accomplishments in terms of waste minimization and waste generation reduction, and the lessons learned, new procedures, and technologies for eliminating or reducing waste stream volumes will be applied in the design of the SSC (see EIS Volume IV, Appendix 10, Section 10.1.3.1.D.3). Additionally, Fermilab has adhered to all applicable

Federal, State, and local standards, criteria, regulations, and guidelines pertaining to the operation of the facility in an environmentally safe manner. Typical permits and regulations are discussed in Volume I, Chapter 6. EIS Volume I, Chapter 5, Table 5.1.6-1, discusses the estimated dose equivalent rates to the maximally exposed individual during construction and operations of the SSC at each site alternative. As shown in the referenced table, the dose equivalent rates are 1/1000th of natural background for the majority of the proposed sites, including Tennessee. These figures include direct radiation, air exposures, and aquatic pathways. Low-level radioactive waste disposal plans are discussed in Comment Response 229.06.

1442.29

Limestone is alkaline, but not corrosive.

Most of the material within the pile would not be accessible to erosion by wind or rains. In addition, very few if any wind-blown particles would be of the size (<10 μm) that could cause lung damage. At each disposal site, the topsoil would be removed and stockpiled on the site and later used to cover the emplaced excavated material and serve as a root bed for revegetation.

Soil excavated during construction of the SSC may contain some very small amounts of naturally occurring radium, but the data in Volume IV, Appendix 5, Section 5.6.6.1 indicate that the concentrations of Ra-226 at the tunnel depths are lower than the concentrations at the surface that contribute to the natural background radiation.

The potential impact of excavated material on groundwater quality is assessed in Volume IV, Appendix 7, Section 7.2.3.6 and Volume I, Chapter 3, Section 3.6. As stated therein, with implementation of mitigative measures such as containment by dikes and retention ponds, and installation of low-permeability liners beneath these ponds, the residual impact to groundwater quality is expected to be negligible. If the proposed Tennessee site is selected for the SSC, the Supplemental EIS would address mitigation measures for spoils in more detail.

1442.30

At each disposal site, the topsoil would be removed, stockpiled on the site, and used to cover the excavated material as soon as possible. The disposal sites would then be revegetated.

During transportation, trucks would be covered so that the material would not blow away, and if necessary, the material in the truck would be wetted down.

See Volume IV, Appendix 10 for more details.

1442.31

One option for use of spoils limestone could be in absorbing sulfur dioxide generated by coal burning power plants. This and other disposal options would be evaluated in the site-specific Supplemental EIS if Tennessee is the selected site.

1442.32

In its original proposal and in the March addendum, North Carolina did not identify to whom the material would be sold. In a revised proposal, the State identified five quarries where limestone could be disposed of. Cost details would be determined after the site is selected.

1442.33

At each disposal site, the topsoil would be removed, stockpiled on the site, and used to cover the excavated material as soon as possible. The material would not blow away because it would be sprayed by water in the interim, compacted, and then covered by topsoil. The disposal sites could then be revegetated.

The purpose of the retention ponds would be to collect the runoff and retain the suspended solids in the water.

Mitigations for spoils disposal are discussed in EIS Volume IV, Appendix 10 and Volume I, Chapter 3, Section 3.6.

1442.34

See Comment Responses 496.03 (first paragraph) and 1442.58.

1442.35

The particle size distribution of tunnel muck from tunnel boring machines (TBM) ranges from slabs 3 inches wide by 9 inches long to dust. The amount of various screen sizes is dependent on TBM design and operating characteristics and the character limestone of the rock being excavated.

1442.36

The radon concentration in the spoils will be dependent upon the radium content of the spoils and its mechanical characteristics, which determine the emanation coefficient. Often, the emanation of radon from surface soil is higher than that from the underlying rock. In Tennessee, the samples of surface soil had a higher concentration of radium than the rock at tunnel depth (Volume I, Chapter 4, Section 4.6.1).

The emanation coefficient is equal to the ratio of the radon atoms released from the material by the number of radon atoms formed by radioactive decay of radium in the material in unit time. Nevertheless, radon-222 has a relative short half-life, 3.823 days. In a short

period, all radon will decay out. Most radon decay products also have short half-lives ranging from 10^{-6} minute to 26.8 minutes. No health impact is anticipated from radon and its decay products in the spoils.

1442.37

Mitigation for the spoils dust during tunneling, transportation, and surface storage are discussed in EIS Volume IV, Appendix 8, Section 8.3.2.2 (Table 8-3).

1442.38

The DOE has not developed a specific plan for keeping material that is leached from spoil piles from entering the groundwater drainage system. The potential impact of excavated material is assessed in the EIS Volume IV, Appendix 7, Section 7.2.3.6. As stated therein, with implementation of mitigative measures such as containment by dikes and retention ponds and installation of low-permeability liner beneath the ponds, the impact to groundwater quality can be prevented. The mitigation strategies will also be described in greater detail in the Supplemental EIS.

1442.39

See Comment Responses 1442.30 and 1442.38.

1442.40

This comment is consistent with EIS Volume IV, Appendix 3.

1442.41

The DOE will prepare a detailed decommissioning plan, cost estimate and NEPA document when the decision to decommission is made. Specific techniques and details will be developed at that time. That would include determining the levels of radioactivity present and how to handle them.

The purpose of EIS Volume IV, Appendix 3, was to provide an evaluation of the feasibility of decommissioning and an order-of-magnitude cost estimate.

1442.42

Title to the space referred to in the comment would remain with the DOE.

The DOE has no plans for using the decommissioned SSC facility for disposal of radioactive or other wastes. Also, no testing programs for this decommissioned facility have been suggested. Tunnel design is technically unsuitable for these purposes.

The final disposition of the occupied facilities is covered in the EIS in as much detail as possible. It is not possible at this time to predict exactly what part of the facility will be useful, e.g., for medical research or educational purposes, at the time of decommissioning.

Prior to the end of SSC operations, when the decision has been made to decommission the facility, a detailed decommissioning plan will be prepared. Decommissioning of the SSC would be reviewed at that time by the DOE to determine if it qualified as a major Federal action significantly affecting the quality of the human environment.

Any use of the land for purposes other than constructing and operating the SSC, including decommissioning the facility, would require full compliance with the NEPA process, including preparation of additional NEPA documents to assess impacts. Disposal or use of the land after the useful life of the SSC by the Government would be analyzed as part of the decommissioning process.

1442.43

As a part of the NEPA review process, alternative method(s) for sealing or filling tunnels, experimental halls, etc., will be considered during the development of the final decommissioning plan prior to the end of SSC operations. Access, consistent with future use of the facility and above-ground structures, will be prevented by whatever means are necessary.

See Comment Response 381.05 for a discussion of measures taken to guard against inadvertent penetration of the tunnel.

1442.44

See Comment Response 1442.42.

1442.45

See Comment Response 991.02

1442.46

EIS Volume IV, Appendices 8, 9, and 14 provide detailed assessments of the issues raised as part of quality-of-life concerns. If the Tennessee site is selected, additional analyses will be conducted for the Supplemental EIS.

1442.47

Particulate matter emissions from all spoils handling activities were estimated in the EIS using emission factors generally accepted as producing very conservative (high) estimates. Tunnel and experimental hall ventilation was also included in spoils handling sections. Other estimates of particulate emissions and needed mitigation measures have been

modified to ensure compliance with ambient air quality standards (see EIS Volume IV, Appendix 8 and Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.3).

See Comment Response 1278.11.

1442.48

Noise produced during operations at F areas is discussed in detail in Volume IV, Appendix 9, Section 9.1.3.1. Sound produced by activities is expected to reach a day-night average sound level of 55 dBA within 450 ft from the service area property line (700 ft from the center of the area). Ground-transmitted vibrations from the cryogenic compressors will not be discernible at locations across the service area property line. The DOE will consider additional mitigation strategies which have the potential to further reduce sound impacts produced by the service area. These additional mitigations, which are described in detail in Appendix 9, include rearranging the service area such that the loudest sources are located close to the center; providing a berm around the entire service area; or relocating the service area away from sensitive locations (also see EIS Volume I, Chapter 3, Section 3.6).

1442.49

EIS Volume IV, Appendix 16, Section 16.3.6, addresses the scenic and visual impacts of the SSC on the Tennessee site. The specific facilities that are within moderately to highly sensitive views have been identified, along with the intensity and significance of the impacts these facilities have on such views. The visual impacts of spoils disposal areas have been addressed in Section 16.3.6.H.

1442.50

See Comment Response 1502.11.

1442.51

Fugitive dust mitigation is discussed in EIS Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.3. See also Volume IV, Appendix 8, Table 8-3 and Comment Response 1278.11.

Discussion of construction noise mitigation is included in the source-by-source analysis in Volume I, Chapter 5, Section 5.1.4.

Transportation mitigations for construction phase activities are discussed in Volume IV, Appendix 14, Section 14.2.1.3.F.

As noted in Volume I, Chapter 3, Section 3.6, the DOE commitment to mitigations will be a function of the site selected, and will be dependent on the final location and design of facilities and final design-phase consultations with Federal, state, and local agencies. These mitigations will be addressed in greater detail in the Supplemental EIS for the selected site. It is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with the applicable environmental statutes, regulations, and standards

1442.52

Air emissions during operations were considered during the EIS process. In Volume IV, Appendix 8, Section 8.3.1.2, the following conclusion was reached:

"The emission points would be provided with the required air pollution control equipment. Each of these sources would be very small. Several may require local air pollution control permits but resultant impacts to the air quality should be local and of little consequence." It is not expected that there will be any odor pollution from the service areas.

EIS Volume IV, Appendix 16, Section 16.3.6.3 presents the visual impact assessment and mitigation measures. There would be significant adverse visual impacts due to above-ground facilities, and a number of mitigation measures are presented in the noted section. These must be evaluated for effectiveness during detailed project design. For instance, even relatively small changes in siting made during final design can affect the success of measures taken to screen the facilities from view. Consequently, the details of visual impact mitigation are best considered in conjunction with final design decisions, and will, therefore, be included in the Supplemental EIS.

Mitigations for noise impacts during operations are described at the summary level in EIS Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.4, and at the detail level in Volume IV, Appendix 9. Noise impacts and associated mitigative measures will also be examined in the Supplemental EIS.

1442.53

Construction of service areas underground is a conceivable possibility technically, for at least parts of the service facility. However, other parts, such as cooling towers, or some other method of heat dissipation, will be required to be aboveground. Such possibilities will be considered during detailed design when site-specific mitigations are considered, and will be addressed in the Supplemental EIS for the selected site. Technical problems associated with the cryogenic apparatus may well prohibit such considerations. It should be remembered that the service areas are 5 mi from each other and that one will not be visible from the other.

1442.54

Quality of life impacts are summarized in EIS Volume I, Chapter 5, Section 5.1.8.5. These are primarily associated with changes to the "character" of an area, such as a conversion from rural to suburban. Visual and aesthetic impacts are discussed in Volume I, Chapter 5, Section 5.1.10, and noise impacts in Section 5.1.4.

The fugitive dust impact is discussed in Comment Response 1278.11.

1442.55

Service areas will be designed and constructed to minimize visual and noise impacts, particularly where they are near residential communities (see Volume IV, Appendices 9 and 16). After the site is selected and more details of SSC design are available, a Supplemental EIS will be prepared which will address in more detail such mitigations.

1442.56

Wastewater management plan presented in EIS Volume IV, Appendix I, Section 1.2.6.12 and Appendix 7, Section 7.1.3.6.F is a conceptual treatment and disposal plan. During the SSC design phase, specifications and performance standards for the proposed package treatment plant will be developed, based on a site-specific study of potential impacts of wastewater disposal (by spray fields, leach fields, or surface discharge) on surface water, ground water, and air environment. Siting, construction, and operation of spray or leach fields will comply with all applicable regulations. For surface discharge, treatment level and effluent quality limits will be specified such that all applicable water quality standards are met. These issues will be assessed in the Supplemental EIS. It is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with applicable environmental statutes, regulations, and standards. See EIS Volume I, Chapter 6, Section 6.1.

1442.57

The tunnel of the proposed SSC is at an elevation below the cave systems. Modeling of radionuclide migration in groundwater due to a hypothetical beam loss in the tunnel is discussed in EIS Volume IV, Appendix 12, Sections 12.2.3.1 and 12.4.1.1. If the proposed Tennessee site is selected for the SSC, a more detailed site-specific analysis of groundwater movement will be prepared for the Supplemental EIS.

Migration of radionuclides from a beam loss accident and groundwater flow are discussed in Comment Response 1442.24.

1442.58

The EIS recognizes that the potential for contaminating groundwaters from the proposed wastewater disposal method exists not only at the proposed Tennessee site but at the other sites as well. This factor is recognized in EIS Volume IV, Appendix 7, Section 7.2.3.6. This appendix includes consideration of the special hydrogeologic features at the proposed Tennessee site. See also Comment Responses 500.03 and 503.03.

1442.59

Design and operation of the treatment plants will be covered after site selection and during final design and in the Supplemental EIS. It is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with applicable environmental statutes, regulations, and standards. See EIS Volume I, Chapter 6, Section 6.1.

1442.60

See Comment Response 1442.56.

1442.61

See Comment Response 1442.56.

1442.62

See Comment Response 1442.56.

1442.63

See Comment Response 1442.56.

1442.64

See Comment Response 1442.56.

1442.65

The DOE presently does not envision any use of the SSC beyond that described in EIS Volume I, Chapter 2. Any future use of the SSC which would create significant impacts not anticipated in this EIS and its attendant supplement would be addressed in additional NEPA review.

1442.66

The specific facility types and functions of future development of the future expansion area (C) and the interaction regions of the far cluster cannot be specified at this time. Whether facilities are developed in these areas depends upon future programmatic requirements. However, it is expected that facilities of the same type as proposed for the

original SSC components would be specified. Should the far cluster and area C be proposed for development, an environmental review of the development consistent with the National Environmental Policy Act would be performed by the DOE.

1442.67

At this time, neither the use of fixed (solid) targets in connection with the SSC collider ring, nor the acceleration of particles more massive than protons are anticipated. There will be modest use of targets with test beams in the test beam area (adjacent to the High Energy Booster ring).

It is conceivable that at some future time, it might be deemed desirable to modify the SSC to provide a capability such as that above, or to provide some new, now unforeseen capability. In such a case, appropriate impact analyses, including Safety Analysis Reviews (SAR) or, if appropriate, environmental reviews would be required.

1442.68

Future modifications that can be foreseen involve increasing the luminosity of the beam (the conceptual design provided for an eventual operating luminosity ten times the design luminosity) and modifications to the detectors. Detectors are usually designed to be optimum for only a certain set of experiments. When such a series of experiments is complete, the detector is shut down and modified to be optimized for a different set of experiments. This is expected to be the case at the SSC.

It is not possible to predict future experiments since they will depend on the results of the first experiments run at the SSC.

Also see Comment Response 1442.67.

1442.69

EIS Volume IV, Appendix 10, Table 10.1.3-14 presents the major components of the SSC that could become radioactive during experiments at the facility. All of these inventories were calculated using conservative assumptions, and it is not likely that they would be larger.

Regarding the amounts of radionuclides and other radiation releases to the environment, the EIS addressed the release quantities and rates in Volume IV, Appendix 10. See Comment Response 1417.13 for a discussion of the possible exposure levels resulting from radiological releases.

1442.70

Experiments will be monitored by DOE's M&O contractor to determine the presence of any unanticipated health and safety impacts. The M&O organization responsible for engineering will be required to oversee change control policies and procedures. The impacts of new designs or modifications to existing designs will be subjected to rigorous reviews including health and safety impacts analysis, and would not be authorized until potential health and safety impacts have been identified and mitigated.

1442.71

See Comment Response 384.02.

1442.72

See Comment Response 1442.65.

1442.73

The SSC must comply with all applicable Federal, State, and local laws and regulations. Fermilab currently has both Federal and State permits and is subject to inspection by regulatory agencies. The recommendation that DOE establish review committees is noted and will be considered for the selected site. See Comment Responses 1442.75 and 384.02.

1442.74

The DOE as a matter of practice uses national and international groups of associated professionals to provide peer review, and input to project planning. The configuration, and function of, any such committees will be decided by the DOE as the SSC project matures and the needs can be more specifically identified.

1442.75

The suggestion of an oversight committee is noted. At some DOE facilities State, local, or citizen's groups participate in facility reviews. It should be noted that the SSC would comply with applicable Federal, State, and local laws, and thus would be subject to review and inspection by appropriate agencies.

See also Comment Response 384.02.

1442.76

See Comment Response 1442.75.

1442.77

See Comment Response 1442.74.

1442.78

See Comment Response 1442.74.

1442.79

Health and environmental impacts of the SSC project are addressed in EIS Volume IV, Appendices 10 and 12 and are summarized in Volume I, Chapter 5, Section 5.1.6.

1442.80

The DOE agrees that most adverse impacts from constructing and operating the SSC could be successfully mitigated. The EIS addresses potential mitigation activities that could be applied to reduce impacts of the SSC on a particular resource area (see Volume I, Chapter 3). Some of these mitigations could be conducted by the State or other entities; the questions regarding the authority of the county or State to mitigate potential impacts from the SSC should be directed to the appropriate State agency. The Supplemental EIS, to be prepared after the SSC site is selected, will identify and analyze specific mitigations needed at the selected site.

1442.81

The EIS examines potential disruption to the normal life of residents in portions of Tennessee affected by the SSC. Socioeconomic impacts which could affect residents lives, including impacts on economy, housing demand, public services, and public finance, were examined for the Tennessee Region of Influence and for the primary impact counties of Bedford, Marshall, and Rutherford (see Volume IV, Appendix 14, Section 14.1.3.6). Certain housing impacts (on Bedford, Marshall Counties) may require a focused local effort; remaining impacts are anticipated to be negligible. Potential impacts to the quality of life of area residents were also examined. Impacts on quality of life are anticipated, most notably for rural farm and nonfarm residents of the area, during both construction and operations. However, careful planning efforts often can help minimize the impacts associated with such projects and the growth that accompanies them (see Volume IV, Appendix 14, Section 14.1.3.6.E).

The State of Tennessee has proposed several options to dispose of excavated material: (1) the limestone could be crushed and used by contractors during site development for roadway surfacing, roads bases, asphalt mixes, concrete aggregate, and construction embankment materials; or (2) the limestone could be sold; or (3) the limestone could be disposed of at 34 possible disposal sites; or (4) could be disposed of by combination of options 1, 2, and 3. At each disposal site, the topsoil would be removed, stockpiled on the site, and later used to cover the excavated material from the site, thus serving as a root bed for revegetation.

1443.01

Comment noted.

1444.01

Comment noted.

1444.02

See Comment Response 509.01, paragraph 1.

1444.03

See Comment Response 1035.04.

1444.04

A concern is raised about the possible impacts of caves and sinkholes on the movement of radionuclides in groundwater at the Tennessee site. There is evidence that caves and sinkholes exist in the area where some of the SSC facilities would be sited. These geologic features are known to be located at relatively shallow depths, and the SSC facilities would be located in distinct geological zones below the plane in which the caves and sinkholes occur. See Comment Response 523.02 for more information.

The concern about tritium entering groundwater used for drinking was addressed in the EIS (Volume I, Chapter 5, Section 5.1.6, Volume IV, Appendix 10, and Volume IV, Appendix 12). The water-solubility of tritium was considered in DOE's conservative analyses, which included accident conditions in which a beam loss occurs and radioactivity is produced in soil outside the tunnel. A model was used to predict the concentrations in water near the SSC, and the model took into account geologic features and other characteristics of the Tennessee site (EIS Volume IV, Appendix 12, Section 12.2.3). The potential exposures arising from the use of groundwater, if a beam loss were to occur, were discussed in detail in Comment Response 497.01. In summary, the annual dose equivalents from consuming water from a nearby well (50 m from the source) at the Tennessee site would be 0.0098 mrem/yr. The estimated level of exposure is considerably less than the public drinking water standard of 4 mrem/yr (40 CFR 141). The hazards expected under normal conditions are projected to be negligible.

The conservatism built into this analysis is important to note. The estimate of exposure greatly over-estimates that which could be expected under normal operating conditions, because the concentration and subsequent projected dose equivalent were based on a hypothetical worst-case accident scenario involving a beam loss.

The injector facilities, which consist of three rings and a linear accelerator, will be located at more shallow depths than the collider ring. The depths for these tunnels would be 14 to 20 ft below the surface. Therefore the movement of any SSC-related radionuclides that would become waterborne near these facilities could potentially be affected by the presence of caves or sinkholes. The radionuclide concentrations that could result from operation of the injector facilities in an area in which caves or sinkholes could influence groundwater transport was considered in Comment Response 1442.57.

1444.05

An error in the input data used in the public finance analysis for Bedford and Marshall Counties has been corrected (see EIS Volume I, Chapter 5, Section 5.1.8.4). Resulting calculations suggest that slight negative cumulative net fiscal impacts would occur in both of these counties during the first four years of the project, to be replaced by virtually no impact for the remaining life of the SSC.

1444.06

See Comment Responses 1462.04 and 1442.24. A discussion of economic benefits for the project is included in EIS Volume I, Chapter 2 and Chapter 5, Section 5.1.8.

1445.01

See Comment Responses 710.01 and 1390.07, third paragraph.

1445.02

The EIS analysis estimated local government capital improvement expenditures based on projected SSC-related population growth in each primary impact county. Data collected from more than 3,200 municipalities and 4,000 school districts in the United States indicate a relationship between population growth rates and spending for capital improvements by local government jurisdictions. This information, provided in a 1981 report prepared by the President's Economic Adjustment Committee, was used as the basis for the EIS capital improvement projections.

Resulting projections for Rutherford County are presented in Volume IV, Appendix 14, Section 14.1.3.6.D. These estimates of capital facilities requirements only consider the costs to accommodate the SSC-related growth.

1445.03

Impacts on the aesthetic character of the Tennessee site have been addressed in EIS Volume IV, Appendix 16, Section 16.3.6 and Volume I, Chapter 5, Section 5.1.10.3.F. Nearly all of the proposed SSC facilities of concern to visual and scenic resources would occur in lands

readily defined as rural or agricultural. The industrial character of the proposed project facilities would be incongruous throughout most of the site.

1445.04

The growth due to SSC and its impacts are discussed in Volume IV, Appendix 14, Section 14.3.1.6. Proposed road improvements and construction are discussed in Volume IV, Appendix 14, Section 14.2.1.3.F.

1446.01

Comment noted.

1446.02

The State of Tennessee supplied the numbers and parcel maps. See Comment Response 710.01.

The EIS considers anything not determined to be a residence to be a business.

See Comment Response 772.03.

1446.03

See Comment Response 880.04. It is assumed that only the relocation compensation would be provided, and compensation is the responsibility of the State. See Volume I, Chapter 5, for a discussion of cumulative impacts.

1446.04

The actual amount of woodland that would be disturbed by construction of the SSC should Tennessee be selected cannot be estimated until a final design is prepared. As placement of the SSC facilities (except the campus and injector) is somewhat flexible, final design would take into account more sensitive habitats including woodlands, and attempts will be made to place the facilities in lower quality or more common habitats.

The actual impact on the local timber industry would be expected to be minimal. The acreage permanently disturbed (see EIS Volume I, Chapter 3, Table 3-2, and Volume IV, Appendix 1) is quite small. There might be a small opportunity for timbering small acreages during early construction, but this would be minor compared to current timbering practices. The amount of timbered land removed from annual logging would be minimal.

1446.05

The EIS public finance assessment studies the cumulative local government fiscal effects to jurisdictions in Rutherford County, Tennessee from SSC construction and operations. The tax revenue loss to local governments from the transfer of private land to Federal ownership in the County as well as required capital improvements were estimated in the analysis and are presented in Volume IV, Appendix 14, Section 14.1.3.6.D.

1447.01

See Comment Responses 1114.04 and 1126.05.

1448.01

Comment noted.

1448.02

The comment is consistent with the housing discussion in EIS Volume IV, Appendix 14, Section 14.1.3.3.B and the traffic analysis in EIS Volume IV, Appendix 14, Section 14.2.1.3.C.

1448.03

Comments noted.

1449.01

In EIS Volume I, Chapter 4, Section 4.9.2.2, Table titled "COMPARISON OF EXISTING UTILITY SYSTEMS IN THE REGION OF THE SITE ALTERNATIVES", the entry for "Construction power available (kV)" under the header "North Carolina" has been changed to 23 kV to correct the actual construction power voltage level available at the proposed site.

1450.01

Comment noted.

1450.02

Information on the proposed new road construction and upgrading of existing roads is presented in Volume IV, Appendix 14, Section 14.2.1.3.E.1.a.

The planning, design, engineering, construction, environmental impact mitigations, securing necessary approvals and permits from the other agencies, and right-of-way acquisition for the new roads would the responsibility of the State. These issues will be addressed by the State and local agencies during final design if the North Carolina site is selected.

1450.03

The State of North Carolina has proposed to convey sewage (0.15 million gal/d) from the main campus to the existing Butner wastewater treatment plant. Mr. J. Dorney, Water Quality Planning Branch, Division of Environmental Management, Department of Natural Resources and Community Development, Raleigh, North Carolina, on June 20, 1988, provided information to the DOE that the existing Butner sewage treatment plant has excess capacity of 1.1 million gal/d, sufficient to handle the campus area flows.

1450.04

Potential impacts of the proposed North Carolina SSC project on surface water quality may result from surface erosion, channel erosion, pollutant run-off, dewatering of the tunnel, and increased wastewater treatment plant effluent. EIS Volume IV, Appendix 7, Sections 7.1.3.5.F presents an assessment of the potential impacts and mitigative measures. Potential impacts on groundwater may result from surface and subsurface construction, disposal of wastewater from tunnel and shaft dewatering, and leaching of spoils. EIS Appendix 7, Sections 7.2.3.5.A.4 and 7.2.3.5.B.2 assess the potential impact on groundwater quality and present possible mitigative measures (also see Volume I, Chapter 3, Section 3.6). No significant secondary or cumulative impacts were identified (see Volume I, Chapter 5, Section 5.2).

1450.05

See Comment Response 707.04.

1450.06

See Comment Response 697.01.

1450.07

See Comment Response 1017.06.

1450.08

Comment noted.

1451.01

Comment noted.

1451.02

The SSC will have a negligible effect on the current growth being experienced in Kane County. From 1980 to 1985, the population of Kane County is estimated to have grown at an annual rate of 1.4 percent, from 278,000 in 1980 to nearly 300,000 in 1985. With the projected SSC-related impact, the population of Kane County is projected to be 329,500 by 1992, an average annual rate of growth of 1.4 percent from 1985 to 1992. Future growth in the population of Kane County is also expected to reflect the continued evolution of Chicago suburbs.

It is DOE policy that Fermilab would continue to be supported if the SSC were sited at some other location. See EIS Volume I, Chapter 3, Section 3.2 for a discussion of the alternatives to the SSC that were considered. It is unlikely that any technical alternatives could render the SSC technologically obsolete in the time frame considered for the SSC project.

DOE recognized that there could be an impact from the loss of property due to construction of the SSC project. See EIS Volume I, Chapter 5, Section 5.I.8.5. Compensation policies for relocated residences were discussed in Volume IV, Appendix 4, Section 4.4.3.

1451.03

Comment noted.

1452.01

Comments noted. The purpose and need for action is the subject of EIS Volume I, Chapter 2. In that chapter, the emphasis is, in agreement with this commenter, on knowledge; jobs are not mentioned. Discussions of society's investment standards are too detailed to discuss in this document and do not affect the impact assessment prepared.

See Volume I, Chapter 2, and Chapter 3, Section 3.1.2 for discussions of purpose and need for the project and site selection criteria, respectively.

1453.01

Comment noted.

1453.02

Only those wetlands that were within 250 ft of surface facilities were included in the wetland assessment presented in the EIS. Wetlands in the vicinity of E8 are all 500 ft or more away from the site. At this distance, with sedimentation and erosion control practices in place, impacts to these wetlands are not expected.

1453.03

The excavated material would be effectively contained during transport by trucks. General possibilities for mitigation of adverse impacts are addressed in the EIS (see Volume I, Chapter 3, Section 3.6). Specific plans for hauling spoils and minimizing spillage will be addressed in the Supplemental EIS prepared for the selected site.

1454.01

Comments noted.

1454.02

Traffic estimates for the roads significantly affected by the SSC are given in EIS Volume IV, Appendix 14, Section 14.2.1.3.C. It should be noted that the estimates are for the peak hours in a peak year during construction and operations. Routes for the construction traffic will be selected during the construction planning stage to minimize the traffic in the areas of highest risk of accidents (EIS Volume 1, Chapter 3, Section 3.6.3). Strengthening of some less-congested roads and additional traffic control by the Illinois Department of Transportation are additional mitigations to be considered if Illinois is selected. Mitigations will be addressed in the Supplemental EIS for the selected site.

1454.03

The SSC will use groundwater for both construction and operations. Because water supplies will come from numerous points, impacts to water levels due to pumping for the SSC will be slight. Impacts to wells from specific construction activities are addressed in Comment Responses 18.03 and 1117.03.

1454.04

See Comment Response 1229.02.

1454.05

See Comment Response 1135.04.

1454.06

See Comment Response 1369.09.

1455.01

See Comment Responses 13.02, 1455.02, 1455.03, and 1455.05.

1455.02

After the SSC site is selected, cultural resource surveys would be completed to identify prehistoric and historic archaeological sites and historic structures specifically subject to potential impacts due to project construction and operations. Evaluations of the inventoried resources would identify those eligible for listing on the National Register of Historic Places. If the proposed Illinois site is selected for the SSC, a Memorandum of Agreement (MOA) between the DOE and the State Historic Preservation Officer (SHPO) and the Advisory Commission on Historic Preservation would be developed. The MOA would include a plan to appropriately mitigate impacts to cultural resources in the event sites are discovered during construction (Volume IV, Appendix 15, Sections 15.1 and 15.1.2.1).

1455.03

See Comment Response 1455.02. If avoidance is not feasible, the principal alternative mitigation measure is to develop and implement a data recovery program at archaeological sites, prior to construction. In this manner, cultural material would be excavated and analyzed to address research questions pertinent to the site. Historic structures that cannot be preserved will be documented before their removal.

The Illinois State Museum has implemented an extensive field survey program to identify and evaluate cultural resources. Sixty percent of defined potential impact areas have been surveyed. The historic building survey is complete. The data available from this survey program were used in the EIS Volume IV, Appendix 15, Section 15.1.3.3, and Volume I, Chapter 4, Section 4.10.1. Evaluations of known resources are currently under way and will continue if the Illinois SSC site is selected. This more detailed discussion will be reviewed in the Supplemental EIS.

1455.04

See Comment Response 1455.02. Procedures for monitoring construction, where necessary, would be included as a component for the Memorandum of Agreement (MOA), as described in EIS Volume IV, Appendix 15, Section 15.1.2.1.A. However, it is expected that in most construction areas the completed archaeological field survey would be sufficient to identify whether or not archaeological sites are present, thus precluding the need for monitoring. Monitoring by professional archaeologists would occur only in areas where the potential for the discovery of archaeological sites remains high, as determined by the intensive surveys of these areas. A more detailed analysis of potential impacts including mitigation strategies will be included in the Supplemental EIS.

1455.05

See Comment Response 570.01.

1456.01

See Comment Responses 856.06 and 861.06.

1456.02

See Comment Response 876.31.

1456.03

The results reported in the EIS Volume IV, Appendix 14, Section 14.1.3.3.E reflect the overall results reported in the telephone survey conducted by the Center for Governmental Studies at Northern Illinois University. Your comments on the telephone survey have been noted and the comments included in Volume IIB of the EIS. In reference to public attitudes to the SSC project in Illinois, there were several sources of information available. These included the following:

1) Illinois proposal with the telephone survey of Illinois residents.

2) DOE EIS Scoping Meetings.

3) News clippings from area newspapers.

4) Site visits including areas of special concern.

5) Petitions both for and against the SSC in Illinois.

6) DOE public meetings on the DEIS.

All of this information has been made available to DOE representatives involved with site selection activities. The DOE is aware of the existence of a variety of opinions concerning the potential siting of the SSC in Illinois. All comments, individual or an organized collective expression, are fully assessed and are considered in preparation of the Final EIS.

1457.01

Comments noted. Details of design and alternative mechanisms of particle acceleration are discussed in the EIS in Volume I, Chapter 3, Section 3.2.

1458.01

The occupational exposures of Fermilab employees have been examined and the results are discussed in EIS Volume I, Chapter 5, Section 5.1.6. Except for a single instance at Fermilab, in which a worker received 5.01 rem of radiation exposure in a single year, all other exposures have been within the DOE limit of 5 rem per year.

A thorough discussion of potential impacts to the public from SSC operations, including an evaluation of possible accidents, is presented in Volume I, Chapter 5, Section 5.1.6 (see also Volume IV, Appendices 10 and 12, and Comment Response 228.14).

Benefits of the SSC programs should parallel those at Fermilab and other high energy physics accelerators, which have contributed to the development of industries and applications that include positron electron tomography (PET) scans, magnetic resonance imaging, and nuclear medicine. However, like any technology from automobiles and airplanes to medical x-rays, there are attendant risks, however negligible, associated with the operation of the equipment or facilities. Like the medical x-ray, the benefits of the SSC are projected to outweigh the risks.

Radiation protection practices have generally presumed that one can predict low dose responses by extrapolation of observations from high-dose effects, and this approach has been the basis upon which DOE, NRC, and EPA have established standards for radiation exposure to workers and the general public. However, some research has indicated evidence of mechanisms, which might under certain circumstances imply that a threshold exists for radiation effects (Journal of the Health Physics Society, Health Physics, Volume 52, No. 5, (May), pp. 521-525, 1987).

1458.02

A very effective safety program has been in place at Fermilab and has resulted in a high level of protection for the people who work there. The SSC health and safety managers will use the valuable experience gained at Fermilab and at other accelerator facilities in designing the worker protection program for the SSC. There is no reason to believe that SSC workers will jeopardize their health in any way by working at the facility (see Volume IV, Appendix 12). As indicated in DOE Order 5480.1B, DOE is committed to protecting the health and welfare of the public and workers who could be affected by DOE activities. DOE's commitment to comply with Federal, State and local environmental rules and regulations is stated in DOE Orders.

1458.03

In various experimental areas of Fermilab, for example APO and NO1, stack releases are continuously monitored. Also, site boundaries are continuously monitored for direct radiation. The closer one is to a source of radiation, the greater the exposure. Therefore, measurements at the source of radiation will be the highest, measurements at the site boundary will be less, and measurements away from the site boundary will be the least. Measurements at the site boundary will thus be conservative and give a higher dose than that received by any member of the general public. For radioactive material that may be carried in the air, measurements are made at the release point before the radioactive material is diluted. These are the measurements used to make assessments about off-site exposures.

The boneyard at Fermilab, which is a secure area not open to the public, lies close to the site boundary. It is used to store activated accelerator components and shielding for reuse. The nearest site boundary dose for 1987 was 3.5 mrem. The maximum exposure to the individual living closest to that point on the site boundary would have been 0.5 mrem for 1987, assuming 24 hour per day occupancy and a dose rate inversely proportional to the square of the distance from the source. This is about 1/1000 of the dose equivalent from background radiation (Baker, S., Site Environmental Report for Calendar Year 1987, Fermilab 88/40 1104.100 UC-41, May 1988).

1458.04

In the 1986 Fermilab Site Environmental Report, the site boundary concentration was calculated using the computer program AIRDOSE-EPA with neutral wind conditions and average wind speed. The average wind speed used was 4.7 m/sec. In the air dose estimation for this EIS, wind speed and stability for 16 compass directions were used to simulate conditions.

The dispersion treatment in AIRDOSE-EPA assumes a continuous plume extending indefinitely outward from the source in a single direction with a single wind speed and atmospheric stability. Fractional contributions to downwind concentrations in each compass direction are based on frequencies of wind and stability category. Realistically, however, wind speed and direction often fluctuate almost continuously as suggested. And the atmospheric stability will ultimately change as a plume is blown downwind. Also deviations from site specific annual average meteorology can be expected at locations beyond a few miles from the facility site.

These limiting factors as applied to dose assessments have been resolved to maximize the estimated individual dose. The highest individual doses are usually close to the release point--usually from several hundred meters to a few thousand meters. The highest site boundary doses for the SSC were estimated at 110 m (for tunnel shaft) and 150 m (for interaction hall) from the release points, respectively (see Volume IV, Appendix 12, Tables 12.3.1-22 and 23). The effective stack height also has been reduced to correct the possible air turbulence or downdrafts. The plume height was assumed to be 4.5 m with zero exit velocity and heat release. The treatment in the code would overestimate concentration at all distances.

In various experimental areas of Fermilab, for example APO and NO1, stack releases are continuously monitored (Radiation Physics Note 68 and Radiation Physics Note 70, Fermilab). In neutrino target train (NO1), the gaseous radioactive effluent is continuously sampled and results are recorded. The radionuclide concentration are at a maximum at the stack before mixing and dilution with the air. Therefore, it is considered conservative to take measurements at these locations. The problem with monitoring people is that the dose from operations such as Fermilab is so small that it is completely masked by the natural background radiation. For example, if an individual who was being monitored with a TLD wore it while he took a flight to the west coast, the badge would pick up approximately 2.5 additional mrem. That is more than what he would receive

from Fermilab in a year (based on conservative assumptions). If someone lives in a brick house rather than a wood house, he will receive approximately 7 mrem more in a year than his neighbor in a wood house. But even the 7 mrem could be 0 or 30 depending on the composition of the brick. A person's diet can make a considerable difference in background radiation. It is all these factors that make it impossible to say in an uncontrolled environment where each mrem came from. Only when the environment is controlled, such as at work or when the exposures are significant over background, would individual monitoring be distinguishable that in relation to a specific source.

1458.05

The concern that there is no safe level of radiation is discussed in *response to Comment Response 1239.03.*

Fermilab does not "dump" radionuclides into the air, land, and water. Waste streams are disposed of in accordance with Federal, State, and local standards, as described in EIS Volume I, Chapter 6. Additionally, the DOE concurs with the concept that the introduction of excess radioactivity into the environment should be avoided. This is reflected in the DOE Orders that exposures to radiation shall be kept as low as reasonably achievable (ALARA).

1458.06

The DOE is committed to construct and operate the SSC in compliance with applicable statutes and regulations (see EIS Volume I, Chapter 6). A regulatory compliance plan will be prepared by the DOE for the selected site prior to construction.

Analysis of the impacts (see EIS Volume I, Chapter 5, Section 5.1.4) expected during construction and operations utilized standard noise source terms delineated in vendor data and references and also used measured sound levels near similarly sized equipment in use at DOE facilities. For example, the source term used for the cryogenic fluid compressors was developed from levels measured at similarly sized equipment at Fermilab. Control measures used were standard practice, many of which are in use at other particle accelerators. For example, the cryogenic facilities for the HERA accelerator at DESY in West Germany use individual compressor enclosures.

Although data submitted by Illinois with the SSC proposal indicates the average day-night sound level (L_{dn}) at the proposed site is on the order of 50 dBA, the very low population density in rural Kane County suggests lower values for L_{dn} in that area. A value of 40 dBA, which is comparable to the values in five of the seven BLQ sites, might be attainable if the contribution of transportation-related noise is absent. Since analyses were performed for sites with either a 40-dBA or a 50-dBA Ldn, the impacts expected from construction or operations at F4 have been bounded.

The number of people in the areas of possible noise impact has been determined by analysis of aerial photographs. These numbers have been used to estimate the magnitude of expected noise impact associated with each construction and operations noise source. The analysis was performed for baseline levels of 40 dBA and 50 dBA (L_{dn}). The results of the 50 dBA baseline analysis are shown in EIS Volume IV, Appendix 9, Table 9-11 which shows 454 people experiencing levels greater than 70 dBA during construction, and 1246 people experiencing levels between 60 dBA and 70 dBA (L_{dn}). The number of people expected to experience day-night levels between 55 dBA and 60 dBA during operations is estimated to be 45. The values for these levels would be the same if the baseline level were 40 dBA (L_{dn}).

1458.07

Comment noted.

1458.08

The format of the EIS follows established guidelines issued by the Council of Environmental Quality (CEQ) for implementing the NEPA process. The DOE places a strong emphasis on the importance of conducting its operations in a manner that is safe and environmentally sound. In this regard, the DOE requires that its operating contractors conduct periodic performance appraisals, including environmental safety and health protection appraisals. These appraisals are performed in accordance with the requirements of the DOE Orders (see Volume I, Chapter 6). Additionally, the DOE maintains an oversight role and conducts regularly scheduled evaluations of its contractors. The authority for the DOE oversight role and the accountability/responsibility charged to the DOE's operating contractors is generally contained in the contract between the DOE and its operating contractor(s). For example, the majority of DOE's contracts contain Health and Safety Clauses which necessitate that the contractor agree to comply with all applicable Federal, State, and local environmental safety and health protection standards, guidelines, and criteria. The DOE monitors against the provisions of the Health and Safety Clause and requests that its contractors do the same. Comments regarding the need for a citizens review committee are the responsibility of DOE and do not affect the impact analyses presented. However, it should be noted that levels of radiation from Fermilab operations are carefully monitored and are well below regulatory standards. Environmental monitoring data are summarized in an annual report which is widely reviewed and distributed, including Federal and State agencies such as the U.S. Environmental Protection Agency, the Illinois Environmental Protection Agency, and the Illinois Department of Nuclear Safeguards.

1459.01

See Comment Response 1126.05.

1459.02

See Comment Responses 275.03, 880.04, and 1369.06.

14511500335888

1459.03

See Comment Response 1007.01 regarding methane gas occurrences, and Comment Response 1279.357 regarding tunnel inflow between E3 and E4.

1459.04

The effect of the weather in Illinois has been taken into account in the Illinois cost estimate (see EIS Volume IV, Appendix 2), and it was determined that construction cost variation among sites was not significant. Haul distances to the four disposal sites average 10 mi (see Volume IV, Appendix 10). With Illinois averaging only one to two heavy snowfalls of 4 to 6 inches per year (see Volume IV, Appendix 5), the winter weather conditions would not significantly affect the construction schedule.

1459.05

The DOE is aware of the existence of a variety of opinions concerning the potential of siting the SSC at any of the identified sites in the BQL. All forms of public expression are valuable and essential in the review of any EIS and in fully complying with the requirements of NEPA. All comments, individual or an organized collective expression, are fully assessed and become an official published part of the NEPA-EIS process. See EIS Volume III, Chapters 2 and 3 for the site selection criteria.

1459.06

See Comment Response 1126.05 for a discussion of the value of the public participation process.

1460.01

Regarding regional transportation, infrastructure and educational facilities, see Comment Response 816.01. Regarding comparative cost of siting the SSC in Illinois, see Comment Response 1276.01.

1461.01

The State of Illinois furnished aerial photographs which show most of the residences in the vicinity of areas F4 and E3. Information was used from these and other aerial photographs to estimate the population currently living in areas that will realize increases in background sound levels during construction and operations. This analysis is presented in the Revision/Errata for EIS, Volume I, Chapter 5, Section 5.1.4, and Volume IV, Appendix 9. The counts of residences include those from the referenced subdivisions. The response to comment 1130.07 gives the estimated number of people estimated to be impacted by noise.

Thompson Junior High School has been added to the list of schools in the vicinity of the SSC site. See Comment Response 860.07 for a discussion of this school.

14511500335889

When a site is selected for the SSC, surveys of the site and its surroundings will be performed to specifically determine the locations of residences and other noise-sensitive locations.

1461.02

See Comment Response 1130.07.

1461.03

Comment noted.

1462.01

Comment noted.

1462.02

Comment noted.

1462.03

See Comment Response 500.03.

1462.04

The DOE agrees that the effectiveness of the recovery and containment system proposed in the referenced Tennessee White Paper is unsubstantiated. Therefore, it is not a proposed mitigation in the EIS Volume I, Chapter 3, Section 3.6. If the Tennessee site is selected, measures to protect shallow groundwater quality in the karst environment at the Tennessee site will be further evaluated. Selected mitigations would be described in the Supplemental EIS. See also Comment Response 500.03.

1462.05

Comment noted.

1463.01

Temporary effects (such as siltation) on water quality of nearby wells may occur due to construction activities of the SSC. These impacts can be minimized to negligible levels by minimizing the amount of disturbed area around drill hole or excavation sites, by using state-of-the-art drilling and shaft sinking techniques, and by minimal use of construction materials with the potential for water contamination. Specific wells that may be impacted cannot be identified until a final design, including the exact location of the SSC facilities, has been developed. The projected groundwater impacts of the SSC at the proposed Illinois site are described in EIS Volume IV, Appendix 7, Section 7.2.3.3. While

operation of the SSC may add to an existing overdraft situation regionally, water sources will be widely distributed and impacts to any specific area will be small. See also Comment Responses 1133.02 (potential compensation to impacted well owners), 18.03 (groundwater quality), and 533.03 (groundwater supply).

1464.01

See Comment Response 1002.01.

1464.02

See Comment Response 533.03.

1464.03

Regional resources such as housing, medical services, educational institutions, accessibility to major airports and other transportation, and other components of the quality of life were considered during proposal evaluation leading to the Best Qualified List (see EIS Volume III, Chapter 1, Section 1.1). SSC-related effects on the quality of life in local communities will depend upon the ability of these communities to plan and finance needed facilities and services. Specific effects on the area's visual characteristics and on the pace of life will largely depend upon the specific pattern of settlement by SSC-related population. Careful planning, with the goal of preserving certain key regional qualities, could minimize many negative conditions associated with rapid growth. See EIS Volume IV, Appendix 14, Section 14.1.3.

Ecological assessment of threatened and endangered species for Illinois is found in EIS Volume IV, Appendix 11.

1464.04

Comment noted.

1464.05

See Comment Response 1292.05.

1464.06

Comment noted.

1465.01

See Comment Response 1126.05.

1466.01

See Comment Responses 873.02 and 1126.05.

1467.01

Comment noted.

1467.02

See Comment Response 1467.04. Land use changes caused by project-related development are assessed in EIS Volume IV, Appendix 13, Sections 13.1.3.7 and 13.1.4.G.

1467.03

No impacts on groundwater quality are projected for the deeper aquifers, but minor impacts may occur to the shallow alluvial aquifers during both SSC construction and operations. These impacts will be minimized through various construction control and waste management techniques. See Volume IV, Appendix 7, Section 7.2.3.7 for descriptions of projected water table and groundwater quality impacts.

1467.04

The U.S. Soil Conservation Service identified 3,389 acres of prime farmland and 1,287 acres of important farmland in the SSC fee simple area. From these inventories, an estimated 588 acres of prime and important farmland would be permanently taken out of production by the SSC at the proposed Texas site. This acreage represents less than 1 percent of the State's prime and important farmland inventory. See the revised EIS Volume I, Chapter 3, Section 3.7.11; Chapter 4, Section 4.8.6; Chapter 5, Sections 5.1.7.2 and 5.2.11, and the Errata to EIS Volume IV, Appendix 13.

1467.05

Comment noted.

1468.01

As described in EIS Volume IV, Appendix 15 and in the Comment Responses 1468.02 through 1468.10, the Illinois State Museum has undertaken an extensive paleontological research program including background research, predictive modeling, and field study. Further study would be undertaken, as necessary, to identify areas potentially containing significant paleontological material which could be subject to impacts during SSC construction.

1468.02

Paleontological resources are considered to be scientifically significant if they possess usefulness to contemporary or future research. Such research value is demonstrated by identifying research questions that can be analyzed utilizing particular paleontological resources in their geological/ecological context. Paleontological resources which

are rare or unique possess particular value for future research due to their potential applicability to yet-to-be-defined research hypotheses.

1468.03

Paleontological resources are abundant and are of importance to the scientific community in the proposed Illinois SSC site vicinity. If the DOE selects the Illinois SSC site, determination would be made of potential locations of paleontological materials where construction impacts would occur. Additional field study to supplement surveys completed to date could be undertaken to evaluate such locations, if necessary. The Illinois State Museum has completed several phases of study for preparation of the EIS. If the proposed Illinois site is selected for the SSC, further studies would be completed as necessary to identify potential adverse impacts to areas with paleontological resources. Mitigative measures would then be taken concerning the resources to ensure that the valuable data would not be lost (EIS Volume IV, Appendix 15, Section 15.2.3.3).

1468.04

The Illinois State Museum has undertaken an extensive paleontological resources research program in preparation of documentation to submit to the DOE for planning the SSC (see references in Volume IV, Appendix 15: McGimsey 1986; State of Illinois 1987, 1988). These studies have included background research (literature review and geological map analysis) and field surveys to identify potentially impacted paleontological sites. If Illinois is the selected site, these data would be further evaluated by DOE to identify construction areas where paleontological resources are potentially located. Additional field survey would be undertaken prior to construction to provide evaluative information for planning purposes.

1468.05

It is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with applicable environmental statutes, regulations, and standards. See Comment Response 384.02 for a discussion of DOE's recognition of the need for establishment of intergovernmental relationships.

After the site is selected, a more detailed discussion of cultural/paleontological resources will be included in the Supplemental EIS as well as a more detailed discussion of mitigation strategies.

1468.06

Prior to construction, contingency procedures (i.e., mitigation measures) would be developed to appropriately respond to the discovery of paleontological resources during construction. Construction workers would be made aware of such procedures. Such discoveries could be made by a professional paleontologist monitoring construction activities (because

resources are likely to be uncovered) or by construction personnel. Procedures would be developed to respond appropriately to both circumstances

1468.07

The Illinois State Museum has studied the proposed SSC site to identify the range of paleontological resources potentially impacted. Sample surveys have been performed by the State to identify some potential locations. EIS Volume IV, Appendix 15, Table 15-12 describes paleontological sites discovered in the SSC project vicinity, based upon research and review of existing collections performed prior to the State surveys for the SSC. After selection of the final SSC site, further evaluation (including further field study, if necessary) and mitigation planning would involve professional paleontologists familiar with the local research and resource circumstances (see Comment Response 1468.04). Consultation with these professionals would take place after selection of the site, as necessary.

1468.08

If paleontological resources are recovered as a result of the implementation of mitigation measures at the SSC site, these findings would be analyzed and documented in a scientific report for future scientific reference. See Comment Response 1468.07.

EIS Volume IV, Appendix 15, Section 15.2.3.3 describes several phases of systematic field survey performed to date by the Illinois State Museum at the proposed Illinois SSC site (see Comment Response 1468.04).

1468.09

See Comment Response 1468.10.

1468.10

Mastodons that have been found in the Quaternary strata are described in EIS Volume IV, Appendix 15. Table 15-2 lists numerous mastodon finds in the vicinity of the proposed Illinois SSC sites.

The SSC tunnel at the Illinois site would be drilled primarily through pre-Quaternary Ordovician formations of the Galena and Platteville Groups (see Volume IV, Appendix 5, Willman and Kolata 1978). Below Quaternary strata, access shafts would be drilled principally through Silurian and Ordovician dolomites, particularly the Maquoketa Group (see Volume IV, Appendix 5, Kolata and Graese 1983). These formations contain many varieties of invertebrate fossils which have been documented. Although further research could be done involving these fossils and their geological distributions, it is expected that the SSC project would have minor overall effect relative to the size of these formations, which extend well beyond the SSC project area. A more detailed discussion will be provided in the Supplemental EIS, as well as a more detailed review of mitigation strategies.

1468.11

Volume IV, Appendix 15 of the EIS summarizes the results of several phases of paleontological research undertaken by the Illinois State Museum including records check, literature reviews, and sample field surveys. Previously discovered paleontological localities in the vicinity have been reviewed in order to characterize the nature of the local resources. Further study would be undertaken, as necessary, to identify areas potentially containing significant paleontological material which could be subject to impacts during SSC construction.

1469.01

Comments noted.

1470.01

EIS Volume I, Chapter 5 discusses potential improvements in quality of life resulting from the SSC.

1471.01

All information including editorials, which have been submitted to the DOE have been reviewed during the site selection process and the preparation of the EIS.

1471.02

See Comment Response 710.01.

1472.01

The hearings' objective was to receive comments on the EIS, not to provide a forum for support or opposition (see Volume I, Chapter 1, Section 1.6). The comments on the hearing format are noted.

1473.01

The EIS presents a conservative, bounding assessment of the radiation exposure risks associated with operating the SSC. (See Volume IV, Appendix 12 and Volume I, Chapter 5, Section 5.6.)

1473.02

DOE facilities are required to use the AIRDOSE-EPA model (or an equivalent that must be approved by the U.S. EPA) in calculating dose estimates resulting from operations. Calculated or measured radiation doses at the Fermilab site boundary are at such extremely low levels that it is impractical to continuously monitor in residences in the surrounding area. A limited program of off-site radiation monitoring in residences (using thermoluminescent dosimeters) has been initiated by Fermilab, and the results will be reported in the annual Site Environmental Report for

calendar year 1988. The CERN accelerator facility in Europe has a similar program. See Comment Responses 1442.15 and 1442.19.

The DOE believes it is possible to extrapolate radiation releases at the SSC from similar (though smaller) existing accelerators. See Comment Response 810.05. See EIS Volume I, Chapter 5, Sections 5.1.6 and 5.2.5, and Volume IV, Appendices 10 and 12 for a discussion of sources of radiation and their impacts.

1473.03

The beam absorbers are designed to contain the radioactivation products formed in them. The beam absorbers consist of a graphite core surrounded by aluminum, steel, and waterproofed concrete (Volume IV, Appendix 10, Section 10.1.2.3.A.1). The beam absorber design incorporates a liner system that is monitored. Provisions are provided for draining into a sump for collection of any leachate. Any water that is drained from the tunnel or any area where there exists a potential for radioactivation will be analyzed for radioactivation products. If the water is found to contain radionuclides over unrestricted release limits, it will be treated as radioactive waste.

A hypothetical beam loss scenario is discussed in Volume IV, Appendix 12, Sections 12.2 and 12.3. The loss of an accelerated beam at a location other than the heavily shielded beam absorbers is the SSC's worst hypothetical accident and could involve the release of radionuclides from the SSC. Modeling results indicate that water pumped from a well located 50 m away from the point of beam loss would have Na-22 and H-3 concentrations below EPA standards.

1473.04

A storage area for SSC-related components that become contaminated will be necessary. The location of the secured storage area will be determined when the final design of the SSC is made. Many components will be temporarily stored until disposed at a low-level waste disposal facility, but it is possible that some equipment will be kept and reused. It is unlikely that a storage area would pose a public health hazard based on the experiences of Fermilab, which would be considered in establishing a boneyard at the SSC. At Fermilab, there has been environmental monitoring around the storage area, and in 1987 the radiation level at the nearest site boundary due to this material was less than 4 percent of the allowable public exposure level of 100 mrem/yr for an individual.

The SSC will be sited, designed, constructed, and operated in strict conformance with applicable Federal, State, and local environmental safety and health protection criteria, regulations, and standards to assure adequate protection of both the SSC work force and the general public. All of these guidelines and regulations are based on the linear dose-response model and non-threshold model. DOE is committed to operate the SSC safely and keep the radiation exposure as low as reasonably achievable.

1474.01

See Comment Response 1126.05.

1475.01

Comments noted.

1476.01

Comments noted.

1478.01

Comment noted.

1478.02

For a discussion of the potential public finance impacts, see EIS Volume IV, Appendix 14, Section 14.1.3.3.D. See also Comment Response 880.04. The DOE believes that the EIS is adequate for the purpose of selecting a site for the SSC. DOE recognizes that further detailed review of impacts at the selected site will be required prior to construction and operations. DOE will prepare a Supplemental EIS following the selection of a site (Volume I, Chapter 1).

1478.03

See Comment Response 710.01.

1478.04

The EIS has been revised with respect to the number of wells located in the vicinity of the proposed Illinois site, including the number of wells that may have to be abandoned due to the project (see EIS Volume IV, Appendix 7, Section 7.2.3.3.A.6). This includes recognition of the existence of municipal wells in the potentially affected area. The specific wells that may be located in the stratified fee area or that may have to be abandoned cannot be identified until a final SSC design has been developed. These aspects will be covered in the Supplemental EIS for the selected site.

The EIS has been revised to indicate that import of Lake Michigan water has begun to the east of the project and is expected to expand, reducing the demand on groundwater sources, including the deeper aquifers (see EIS Volume IV, Appendix 7, Section 7.2.3.3.A.1). This would benefit groundwater supplies in the western portion of the project because of the regional extent of the deeper aquifers.

1478.05

Tunnel exhaust gases and radon are addressed briefly in EIS Volume I, Chapter 4, Section 4.6, and in more detail in Volume IV, Appendices 10 and 12. Also, see Comment Response 1442.11.

1478.06

Mr. L. Eastep, Manager, Permit Section, Division of Land Pollution Control, Springfield, Illinois provided information on May 24, 1988, that the time remaining for the Settlers Hill Landfill is 12 years. No change was made to the EIS.

1478.07

Future land use plans at the regional, county, and site-specific levels of analysis are provided in EIS Volume IV, Appendix 5b, Sections 5.3.10.1 and 5.3.10.2.

1478.08

The number of people in the areas of possible noise impact has been determined by analysis of aerial photographs. This number has been used in estimating the magnitude of expected noise impact associated with each construction and operations noise source. The revised results for the F1 site in Illinois are summarized as follows:

> During construction the number of people exposed to outdoor noise levels greater than 70 dBA (L_{dn}), i.e., those who are within 630 feet of the center of an E or F area, is estimated to be 3. During this period, the number of people experiencing levels between 60 dBA and 70 dBA (L_{dn}) is estimated to be 32.
>
> During operations of the SSC, the number of people experiencing outdoor levels in the range of 55 dBA to 60 dBA (L_{dn}) is estimated to be 3.

The nature and extent of construction, if any, at J1 is currently undefined, thus no estimate of possible noise impact from J1 has been prepared.

1478.09

A comprehensive environmental monitoring program will be implemented at the SSC site to ensure the safety of the employee, the environment, and the general public during construction and operations. At this conceptual design stage, a detailed program has not yet been prepared. The environmental monitoring programs for radiological hazards will be established prior to and during operations of the SSC. These programs will be designed to detect, track, and assess the impacts from any radiation or radioactive materials released from the facilities. Environmental monitoring is capable of detecting levels of released nuclides much lower

than regulatory limits. These programs will be able to detect radiation/ radioactivity prior to impacts on the general public. The SSC environmental monitoring program will utilize continuous monitoring of the site boundary and the points of release, such as stack, and on-site and off-site samples as is currently conducted at the Fermilab. In Fermilab, stack releases are continuously monitored by a GM-based sampling system consisting of an Eberline RM-14 ratemeter and a GM thin window "Frisker" probe (S. Butala and S. Baker, "Calibration of the N01 Stack Monitor," Radiation Physics Note 68, March, 1988).

1478.10

According to the EIS analysis, projected SSC-related in-migrants are not anticipated to exceed 3,300 in any year for the entire Illinois Region of Influence. Only a portion of these workers are expected to settle in the Fox Valley area (see Volume IV, Appendix 14, Section 14.1.3.3.B). Socioeconomic impacts of these in-migrant workers, including impacts on housing and public schools, are presented in Section 14.1.3.3 of the above Appendix. Infrastructure impacts of these in-migrants are presented in Sections 14.2.1.3.C and 14.2.2.3.C. And impacts on water are presented in Volume IV, Appendix 7, Sections 7.1.3.3 and 7.2.3.3. The area should be able to accommodate the projected increases in demand for housing, public education, public road use, and water.

1478.11

Private land would be removed from the property tax base of several school districts in Illinois, reducing the amount of revenue for these jurisdictions. The EIS analysis indicates that although there would be a cumulative long-term property tax revenue loss to Kane County jurisdictions, there would also be a long-term increase in both direct and indirect tax revenue from project spending and additional spending by SSC construction and operation workers. The EIS did not specifically estimate property tax losses to individual school districts or other government entities. This level of analysis could be included in a supplemental EIS if the Illinois site is selected for the SSC. Cumulatively for all jurisdictions in Kane County, the long-term direct and indirect tax revenue increase was estimated at approximately $3.9 million, while the property tax revenue loss was estimated at about $300,000 annually. The public finance analysis is presented in the EIS in Volume IV, Appendix 14, Section 14.1.3.3.D.

1478.12

SSC-related effects on the quality of life in local communities will depend on the settlement patterns of SSC-related workers and on the ability of local communities to respond to the growth effects. The capacity of communities to adapt to growth varies with the ability of the community to plan and finance needed facilities and services and by their past experience with development. Many of the negative conditions associated with rapid growth can be minimized through careful planning.

The net public finance and infrastructure impacts to local governments would vary, in part, from differing tax rates, from differing levels of SSC-related population effects, and from the amount of private land transferred to Federal ownership. Questions concerning strategies and commitments by the State to mitigate local city and county infrastructure impacts should be directed to the appropriate State agency.

1478.13

Traffic analysis for the peak hours during the peak years of 1992 and 2000 is presented in EIS Volume IV, Appendix 14, Section 14.2.1.3.C. Some damage would occur to existing roads if they were not designed or upgraded to serve the SSC construction traffic loads.

1478.14

EIS Volume IV, Appendix 16, Section 16.3 discusses the visual impact of the SSC facilities and mitigation measures that should be considered during final design. Architectural treatment, berms, and landscaping are among the measures described. The visual impact assessment is concerned with above-ground facilities only and the required construction activities. The I areas are the buried beam zones and buffer areas. There are no above-ground structures in these areas; hence, there is no need to discuss mitigation measures.

1478.15

See Comment Responses 710.04 and 880.04.

1478.16

The stratified fee concept is described in the EIS, Volume I, Section 3.6.1.1, and Appendix 4. It is designed to ensure safety and minimize conflicts between SSC operations and existing surface users.

1479.01

Parcels 300-33-022B, 300-33-025A, 300-33-025B, and 300-33-025C are not identified on Figure 3-1, Sheet 6 of the parcel maps submitted May 27, 1988, in response to Appendix D of the ISP. Additional information and updating of maps would be incorporated into a Supplemental EIS for the selected site. See Comment Response 710.01 for a discussion of land acquisition and data verification concerns.

1480.01

Revisions to correct any applicable errors identified in this comment letter are indicated in the following comment responses. These corrections are provided either as revised text in Volume I, Chapters 4 and 5 or as Errata attached to Volume IV, Appendix 5.

Sources cited in the text of the EIS are referenced at the end of each chapter in Volume I. Use of these separate reference lists may be more appropriate for assessing ecological considerations than referral to the "Principal References" section (Volume I, Chapter 9). The Appendices also contain individual reference lists for cited material. The references for Volume IV, Appendix 5, Section 5.1.9 are included in the Errata for that appendix.

1480.02

The State of Arizona proposed two types of spoils disposal options: transportation of spoils to abandoned mines or surface disposal of spoils within the high-energy booster (HEB) ring (1 mi^2 in area; 1 ft thick). The DOE believes that the EIS correctly assesses the impacts to surface lands at the SSC site of the mine disposal options. The impact of surface disposal in the HEB ring has been added to the EIS, Volume I, Section 5.1.5.1.B.1 and Volume IV, Appendix 11, Section 11.3.1.

1480.03

This comment pertains to Drawing No. PL-1, which occurs not only as Figure 3-8 in Volume I, Chapter 3, but also as Figure 1.2.1-1 in Volume IV, Appendix 1. This drawing does not show two sites denoted K5. However, F5 was inadvertently deleted from this drawing. F5 is located on the short axis of the collider ring, exactly halfway between sites K4 and K5. The figures have been corrected in the EIS. Various other versions of the Arizona site map, including Figures 1.2.1-3, 1.2.1-4, and 1.2.1-5 in Volume IV, Appendix 1, do show the correct location of site F5.

1480.04

See Comment Response 1480.13.

1480.05

If fencing and other controls are used around the SSC site in Arizona, they would be instituted in consultation with Arizona Game and Fish Department and BLM, as discussed in Volume I, Chapter 5, Section 5.1.5.4.A, and in Volume IV, Appendix 11, Section 11.3.1.4. Attention would be given to appropriate selection of fence type and location to avoid direct adverse impacts to sensitive wildlife species. This information is contained in Volume I, Chapter 3, Section 3.6.3. More detailed mitigation planning will be discussed in the Supplemental EIS after the final site selection has been made.

1480.06

If water catchments around the SSC site in Arizona are used by bighorn sheep or mule deer, efforts could be made to reduce adverse impacts by human activities. This information is contained in Volume I, Chapter 3, Section 3.6.3.

1480.07

Changes suggested by the comment have been incorporated in EIS Volume I, Chapter 4, Table 4-16

1480.08

See Comment Response 658.38.

1480.09

The Gila monster has been added to EIS Volume I, Chapter 4, Section 4.7.4.1 as a candidate species that is known to occur in the immediate site area.

1480.10

Revisions have been made to EIS Volume I, Chapter 4, and Volume IV, Appendix 11 regarding the natural history of the desert tortoise and Gila monster based on information provided by the commenter.

1480.11

Estimates of the status of bighorn sheep populations in Arizona contained in EIS Volume I, Chapter 4, Section 4.7.5.1 and Volume IV, Appendix 5, Section 5.1.9.5.C.2 are based on the State of Arizona site proposal and published literature sources. Other literature sources such as the Lower Gila South Final Wilderness EIS (BLM, 1987) have also been searched and appear to support the information in the site proposal. If the Arizona site is selected as the SSC site, it will be necessary to determine the status of bighorn sheep in the Maricopa area. The Supplemental EIS would contain results of investigations of the sheep population size, densities in different parts of the state, increases or decreases of sheep numbers in the past decade, and the effects of hunting.

1480.12

Information contained in the comment has been used to modify the text in EIS Volume I, Chapter 4, Section 4.7.3.1.

1480.13

The delineation of bighorn sheep habitat found in the EIS Volume I, Chapter 5, Section 5.1.4, has been derived from that specified by the BLM (1987). The habitat boundaries do not include all the mountainous terrain or the proposed F6 service area which is currently sited at the edge of the mountains. In EIS Volume IV, Appendix 5, Section 5.1.9.5.B.2 there is a reference to all of the Maricopa Mountains being prime sheep habitat. This difference between the mapped areas of habitat and the extent of the mountains is due to the fact that these animals tend to make significant seasonal movements over long distances (Volume IV,

Appendix 11, Section 11.3.1.2) That is, the bighorn sheep may occupy the central mountains for much of the year, but make seasonal forays to other nearby areas.

If Arizona is selected, further studies of the bighorn sheep would be conducted to specifically delineate the sheep habitat and to determine the extent of the effects of activities associated with SSC construction and operations on this sensitive species. This information would be included in the site-specific Supplemental EIS. Interagency cooperation would be anticipated.

1480.14

EIS Volume I, Chapter 5, Section 5.1.5.1.B.1 has been modified to indicate that the most sensitive areas for populations of the desert tortoise typically occur in the mixed cacti/palo verde associations of incised washes and along rocky bajadas, mountain slopes, and pediments.

1480.15

See Comment Response 428.78.

1480.16

In response to this comment, recent information concerning the presence of the Tumamoc globeberry in the vicinity of the proposed Arizona SSC site has been added to the EIS in Volume I, Chapter 4, Section 4.7.4.1 and Chapter 5, Section 5.1.5.2 and Volume IV, Appendix 11.

1480.17

Information on hunting frequency and success at the proposed Arizona SSC site would be incorporated into the Supplemental EIS if Arizona is selected as the SSC site. Other changes as suggested by the comment have been incorporated in the text (see Volume I, Chapter 5, Section 5.1.5.4.A and Volume IV, Appendix 11, Section 11.3.1.4).

1480.18

The notation for site E4 in EIS Volume IV, Appendix 5, Section 5.1.9.2 has been changed to show that it is located adjacent to the Sand Tank Mountains and not in the North Maricopa Mountains.

1480.19

The notation for site E7 in EIS Volume IV, Appendix 5, Section 5.1.9.2 has been changed in the Errata to show that the site is in the North Maricopa Mountains and not adjacent to Bender Wash. It is also noted that the site is in the desert tortoise, gila monster, and bighorn sheep habitat areas.

1480.20

The notation for site F4 in EIS Volume IV, Appendix 5, Section 5.1.9.2 has been changed in the Errata to show that it is not located in the North Maricopa Mountains and that it is not in prime bighorn sheep habitat.

1480.21

The notation for site F6 in EIS Volume IV, Appendix 5, Section 5.1.9.2 has been changed in the Errata to show that it is located in the north Maricopa Mountains and not near Bender Wash.

Bighorn sheep have not been mentioned in the notation because site F6 is not in the sheep habitat area as presently shown in EIS Volume IV, Appendix 5, Section 5.1.9.5.C. Further studies to delineate the extent of bighorn sheep habitat would be conducted for the Supplemental EIS if the Arizona site is selected for the SSC project.

1480.22

See Comment Response 428.78.

1480.23

See Comment Responses 1480.18, 1480.19, 1480.20, and 1480.21.

1480.24

The comment questioning whether the desert tortoise is a dominant species in the bajadas is noted. The commenter is directed to statements in EIS Volume I, Chapter 4, Section 4.7.3.1 regarding potential population distribution of the species. If Arizona is selected as the SSC site, additional field surveys would be conducted that could determine dominant species at each of the areas likely to be disturbed by project development.

1480.25

The first sentence, second paragraph of EIS Volume I, Chapter 4, Section 4.7.5.1 has been revised as suggested.

1480.26

Information contained in the comment has been incorporated in the Errata to the text in EIS Volume IV, Appendix 5, Section 5.1.9.2.B.3.

1480.27

Information contained in the comment has been incorporated in the Errata to the text in EIS Volume IV, Appendix 5, Section 5.1.9.2.B.3.

1480.28

Information contained in the comment has been incorporated as Errata in EIS Volume IV, Appendix 5, Section 5.1.9.2.B.3.

1480.29

See Comment Response 428.78.

1480.30

The comment is consistent with information provided in EIS Volume IV, Appendix 11.

1480.31

See Comment Response 428.78.

1480.32

See Comment Response 428.78.

1480.33

See Comment Response 658.107.

1480.34

Information contained in the comment has been incorporated in the Errata to the text in EIS Volume IV, Appendix 5, Section 5.1.9.5.A.1 and is additionally contained in EIS Volume IV, Appendix 11, Section 11.3.1.2.

1480.35

Information contained in the comment has been used to modify the text, and is presented in the Errata to EIS Volume IV, Appendix 5, Section 5.1.9.5.C.1.

1480.36

See Comment Response 428.78.

1480.37

The sources for the map in Figure 5.1.9-3 in EIS Volume IV, Appendix 5 are Palmer (1987) and Vaughan (1987), and are cited in the Errata to Figure 5.1.9-3 in Volume IV, Appendix 5.

1480.38

See Comment Response 1480.13.

1480.39

See Comment Response 1516.24.

1480.40

The lists of references to Volume IV, Appendix 5, of the DEIS were inadvertently omitted and have been included as errata for that appendix. These references, plus those reference sources listed for Volume IV, Appendix 11, of the EIS are primarily publications of the U.S. Department of Interior (U.S. Fish and Wildlife Service and Bureau of Land Management). These sources appear to be confirmatory of one another. If the proposed Arizona site is selected, further investigations, additional research and field surveys of the desert tortoise and other important species would be conducted and reported in a site-specific supplement to the EIS. As required, consultation with the U.S. Fish and Wildlife Service on threatened and endangered species would continue.

1480.41

Information on the natural history of the desert tortoise provided by the commenter has been incorporated into Volume IV, Appendix 11, Section 11.3.1.2 of the revised EIS.

1480.42

See Comment Response 1480.41.

1480.43

See Comment Response 1480.41.

1480.44

See Comment Response 1480.41.

1480.45

See Comment Response 1480.41.

1480.46

Information on the natural history of the Gila monster provided by the commenter has been incorporated into Volume IV, Appendix 11 of the EIS. References have been included in the revised Appendix 11.

1480.47

See Comment Response 428.78.

1480.48

Information contained in the comment has been used to modify the text and is presented in the Errata to the text in EIS Volume IV, Appendix 5, Section 5.1.9.6.C.

1480.49

Information on the desert tortoise and the Gila monster regarding the species' requirements for cover (which may be a limiting factor in distribution and habitat utilization), has been incorporated into EIS Volume I, Chapter 4, and Volume IV, Appendix 11.

1480.50

EIS Volume IV, Appendix 5, Figure 5.1.9-4 has been modified and is presented in the Errata to that Volume.

1480.51

The bighorn sheep habitat area and the siting of service area F6 as shown in EIS Volume IV, Appendix 9, Section 9.1.3.3 are identical to those areas shown in Volume I, Chapter 5, Section 5.1.4. Please see Comment Response 1480.13 in regard to the delineation of bighorn sheep habitat. The Bureau of Land Management is the source of information on bighorn sheep distribution data used in the EIS. The reference is given in Volume IV, Appendix 11.

1480.52

Changes as suggested by the comment have been incorporated into EIS Section 11.3.1, Appendix 11, Volume IV.

1480.53

See Comment Response 1480.41.

1480.54

See Comment Response 658.134.

1480.55

See Comment Response 658.42.

1480.56

The inclusion of references in the DEIS to research on the effects of noise on the bighorn sheep along riverways was in error. The cited research was not applicable to conditions at the proposed Arizona site. These references have been deleted in the revised EIS.

1430.57

EIS Volume IV, Appendix 11, Section 11.3.1.2 mentions that service area F6 is a portion of the bighorn sheep habitat that might be adversely affected by human activities. Sheep in the area of F4 may be impacted by noise and human presence during construction. If the Arizona site is selected as the site, further studies of the bighorn sheep would be conducted to determine the effects that activities associated with SSC construction and operations (for example, noise) may have on this sensitive species.

1480.53

Suggested changes have been incorporated in the text of EIS Volume IV, Appendix 11, Section 11.3.1.4.

1480.59

The organization is on the SSC mailing list.

1481.01

Comment noted.

1481.02

See Comment Responses 710.01 and 880.04.

1481.03

Comments noted.

1481.04

Comment noted.

1482.01

Comment noted.

1482.02

Comment noted.

1482.03

The Fermilab Tevatron is comparable to the SSC in many ways and is an excellent reference for understanding the basis of the proposed SSC. They are both hadron-hadron colliders and circular in plan; both operate in the TeV energy range and use superconducting magnets. The differences are in beam energy, luminosity, and physical size. The beam energy of the SSC is 20 times that of the Tevatron; the luminosity of the SSC is

1,000 times greater; and, of course, the circumference of the SSC is much greater (53 versus 4 miles). Beam energy in accelerators is related to effective dimensions that can be probed. Thus, the SSC can be used to investigate processes and structures 20 times smaller than those probed at the Tevatron. Luminosity is a measure of the number of interactions produced over a period of time. Thus, if two machines had equal energies but one had a luminosity 1,000 times greater than the other, the high-luminosity machine would produce data 1,000 times faster than the other.

1482.04

See Comment Response 312.03.

1482.05

See Comment Response 312.04.

1482.06

See Comment Response 312.09.

1482.07

The discussion in the DEIS on the impacts related to administrative (land acquisition) or safety-related (nearness to tunnel or other SSC facilities) loss of water wells have been revised to provide an accurate assessment of the potential for loss of water wells at each site.

To assure safety, it is likely that a 150 ft radius around the tunnel will be established within which no water wells, existing or new, will be allowed. A 1,000 ft wide restricted zone along the tunnel (500 ft on each side) is anticipated. This zone is established for control, however, and wells within it would not be required to be closed. Replacement of wells within this zone may be limited due to the vibrations from drilling. However, this would likely be dictated by site specific conditions or timing of the drilling and is not excluded. Existing wells on fee simple land for the project would likely have to be abandoned, but this is not assured in all cases.

State records of water wells were available for the EIS, but the State indicated that the records were not complete. Limited field survey information was available and therefore it was assumed that the well data were not detailed enough to develop an accurate count of the wells that fell within the specific total restriction areas identified above. Given these limitations, the intent of the presentation was only to identify the approximate number of wells within the footprint of the SSC and provide a general comparison of the relative density of water wells near the individual state sites. The number of wells which might be hydrologically impacted by SSC activities (water level declines or possible water quality changes) also cannot be accurately estimated with the available well records and the lack of final siting and design

information. Both of these issues (well closures due to land acquisition and proximity to facilities and wells hydrologically impacted) will be addressed in detail in the Supplemental EIS to be prepared for the selected site.

See revised EIS sections Volume I, Chapter 1, Table 1-1; Volume I, Chapter 3, Table 3-7; Volume I, Chapter 5, Section 5.4 and Table 5.6-3; and Volume IV, Appendix 7, Sections 7.2.3.1.A.6 through 7.2.3.7.A.6. The figures showing the location of wells have been deleted from the EIS.

To reflect the lack of completeness in well records, the Michigan discussion now indicates in excess of 100 wells in the SSC footprint with a limited number directly affected and required to be abandoned by the project. If the Michigan site is selected, detailed field surveys will be performed to accurately determine the number and location of all existing water wells within the footprint and the number that would be required to be abandoned.

1482.08

See Comment Response 810.03.

1482.09

See Comment Response 1548.68.

1482.10

See Comment Response 312.06.

1482.11

The proposed railroad siding is discussed in EIS Volume IV, Appendix 14, Section 14.2.1.3 D. The State of Michigan would be responsible for the design and construction of the siding. If the Michigan site is selected, additional information will be provided.

1482.12

Please see Comment Response 312.08.

Specifically, at the Michigan site, the beam ejection point is 130 ft below the surface. Therefore, the total annual dose equivalent from direct radiation (hadrons and muons) at the surface would be immeasurably small (less than 0.001 mrem/yr). The annual hadron dose equivalent at the surface above the beam absorber for a depth of 130 ft is much less than 0.001 mrem/yr (see EIS Volume IV, Appendix 10, Table 10.1.3-3, Annual Dose Equivalent from Hadrons: Beam Absorber), since the dose equivalent from hadron at the surface for a depth of 46 ft (density of 2.24 g/cm^3) is less than 0.001 mrem/yr (see Volume IV, Appendix 10, Figure 10.1.2-4, Hadron Dose: Beam Absorber). The muons are at approximately the beam depth of 130 ft.

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The annual muon dose equivalent at the depth of the beam plane as determined at the boundary of the controlled zone downstream from the beam absorber is 0.9 mrem (see Volume IV, Appendix 10, Table 10.1.3-5, Annual Dose Equivalent from Muons: Beam Absorber).

Overall radiation exposure to stratified fee residents is expected to be less than 0.001 mrem/yr, an immeasurable amount. It is insignificant when one considers that the average individual receives about 360 mrem annually from background radiation (see Volume IV, Appendix 12, Section 12.2.1.1.A and Table 12.2.1-1).

1482.13

According to the September 15, 1988, article from the Leslie Local Independent which the commenter submitted, paragraphs 7-10 invite supporters, as well as those opposed to the SSC, to participate in the hearings. This is consistent with the approach that the DOE has followed in announcing opportunities for public participation and seeking input from all parties whether for or against the SSC.

1482.14

The comments on community support as reported in the ISR survey have been noted and included in Volume IIA of the EIS. It should be noted that the research reported in the above report was conducted in early 1988. The overall results of this survey are included in EIS Volume IV, Appendix 14, Section 14.1.3.4.E. It should also be noted that, at the request of the governor of the State of Michigan, a team of researchers from the Institute for Social Research at the University of Michigan has been conducting studies of the social effects and community response to the proposed SSC project in the Stockbridge area. The program of research activities was designed to obtain various types of data from different populations in relation to the expected degree of impact of the project. A third stage of the research activity involved systematic in-depth ethnographic reinterviews to measure attitude changes due to the announcement and the more real prospects of siting the SSC in Michigan. The social impact assessment methodologies are designed to provide scientifically valid findings about the social impacts and community responses to the SSC.

1482.15

The status of the conceptual design of the service area is such that making assumptions about components is necessary not only to compile a source inventory, but also to perform attenuation modeling. In this case, the conceptual design is silent on these specific components. Their presence was assumed due solely to the lack of detail in the design. However, that detail design will examine the need for the control measures described. These assumptions can best be viewed as design-controlled mitigations, and will be addressed as such by the DOE. DOE's mitigations strategies would depend upon the characteristics of final design and the final site selected, and will be analyzed in the Supplemental EIS for the selected site.

See Comment Response 312.09.

1482.17

The text has been revised to make the two sections consistent. See EIS Volume I, Chapter 5, Sections 5.1.5.4 and 5.6.4.4.

1482.18

Following the operational period, components containing radioactivity over unconditional release limits will be handled in one of three ways: (1) Components that can be recycled by other facilities will be removed and packaged and shipped per U.S. Department of Transportation regulations. (2) Components that contain the majority of the radioactivation products that have been designed for removal (the beam absorbers for example) will be removed and packaged and shipped per DOT regulations to an authorized disposal facility (see Comment Response 276.03 for a review of disposal site plans). Radioactive waste and liquids containing accelerator produced radionuclides above release limits will be processed and disposed of in accordance with Comment Response 276.03, above. (3) Structural and large nonrecyclable components containing low-levels of accelerator-produced material may be sealed from intruder access, monitored, and allowed to decay. See EIS Volume IV, Appendix 3.

1483.01

Attached materials were reviewed in the process of preparing the EIS. The comments regarding state and local agency/group activities are noted. See Comment Response 1126.05.

1483.02

The EIS is sufficient in its analysis of impacts to support site selection. There will be a supplemental EIS prepared to address in more detail specific issues at the selected site.

1484.01

Comments noted.

1484.02

See Comment Response 1126.05.

1485.01

Comment noted.

1485.02

See Comment Responses 522.12, 522.23, and 1485.20.

145115003358832

1485.03

The threat to the karst drainage basin from hazardous materials spillage is relatively small since these materials will be used in small quantities at the SSC project. Protective measures will be in place where they are used and stored so that any spillage that might accidentally occur during handling can be contained and cleaned up quickly. These design-based mitigative measures will be incorporated into the SSC operations regardless of where the SSC is sited.

Regarding urban encroachment and additional information on efforts and plans to protect the unique karst systems at the Tennessee site, see Comment Responses 500.03, 503.03, and 1485.14.

1485.04

See Comment Responses 500.03, 503.03, and 509.01.

1485.05

Comment noted.

1485.06

See Comment Response 522.03.

1485.07

If the injector complex were to be constructed at the surface at the proposed Tennessee site, in the location currently identified, at least a portion of the Mebone Cave would be destroyed. The State of Tennessee, however, proposed to construct the SSC High-energy Booster (HEB) at a depth to avoid known karst features. Adoption of this construction alternative will avoid most cave impacts. Should the Tennessee site be selected, final design studies would seek to avoid problematic geologic features such as caves see (EIS Appendix 5, Section 5.6.1).

1485.08

The geotechnical exploration that will be needed at the Tennessee site is detailed in paragraph 4 of Comment Response 500.03. If these investigations focus on the potential impacts of construction at specific locations, they need not be "extensive." The techniques are not extraordinary for geotechnical exploration in the region.

1485.09

If the Tennessee site is selected for the SSC the injector would be constructed underground, as suggested by the proposer, rather than by cut-and-cover if the Tennessee site is selected for the SSC. Strategies for avoiding impacts due to shafts penetrating karst features are described in Comment Responses 500.03 and 509.01. Spoils piles and their related

silt retention ponds will not be located where they may alter the karst hydrology (see Comment Response 509.01, paragraph 4). Roads, pipelines, and utilities can be routed around sensitive sinkholes and windows, and will be constructed so that they do not change the existing drainage pattern or otherwise impact the features.

1485.10

EIS Volume I, Chapter 3, Section 3.3 has been modified to identify these continuing activities in the karst topography of Middle Tennessee.

1485.11

Spoil piles and associated silt retention ponds will be located so that they do not impact sinkholes and karst windows. See also paragraph 5 of Comment Response 509.01.

1485.12

The number of wells that may exist outside of the SSC footprint at the Tennessee site has not been characterized for this EIS. EIS Volume I, Chapter 5 and Volume IV, Appendix 7, Section 7.2.3.6 have been revised to note the existence of relatively extensive karst features in the shallow rock units at the Tennessee site. It is noted that impacts to wells may be more extensive due to the occurrence of the karst features. It is recognized that additional well surveys would be needed if Tennessee is the selected site. This would include the identification of the wells to which the comment refers, and the assessment of potential impacts on specific wells. Results would be evaluated in the Supplemental EIS if the Tennessee site is selected.

1485.13

The DOE is aware of the potential for project-related activities to adversely affect the Snail Shell Cave system. For additional discussion see EIS Volume IV, Appendix 11, Section 11.3.6.1. Should Tennessee be selected as the site for the SSC, a Supplemental EIS will be prepared that will examine potential impacts, such as those on Snail Shell Cave, in much greater detail. Once these impacts have been fully identified in context with the proposed facility design and layout, the DOE is committed to working with State and Federal resource agencies to develop effective mitigations.

1485.14

See Comment Responses 500.03 and 503.03 regarding the approaches that will be used to avoid impacts to the sensitive cave and karst system at the site during construction and operations of the SSC if Tennessee is selected as the site. The relationship between karst features and population settlement patterns is discussed in Volume IV, Appendix 5, Section 5.6.10.1.C.

1485.15

When the EIS presented radiation exposures for maximally exposed individuals, the DOE did consider persons who might be exposed underground, such as cave explorers. One of the accident scenarios that was evaluated was a loss of beam in which the highest exposures to an individual would be to those located at the depth of the tunnel at the time of the loss. The hadrons produced by such an event could result in exposure if the cave explorer was within 30 ft of the tunnel. However, the DOE requires that there will be a minimum of 30 ft of earth surrounding the tunnel. Thus, it is not possible for a cave to be any closer than 30 ft, and if a cave were located within the restricted zone of 150 ft from the tunnel, it is unlikely that its use would be permitted. The EIS indicated that at a distance of 35 ft from the tunnel and in light soil conditions, the one-time dose equivalent that could occur, if a person was permitted in this area, would be less than 0.1 mrem (see Volume IV, Appendix 10, Figure 10.1.2-5).

Another source of exposure from a beam loss would be from muons which could travel further in the ground than hadrons. If a person were located 150 ft from the tunnel at the edge of the restricted area, the one-time dose equivalent from muons is estimated to be 100 mrem at the Tennessee site (see Appendix 10, Table 10.1.3-8). Exposure levels would decrease by a factor of 2 for every 500 ft from the point of loss.

It should be recognized that the probability of a person being near the point of a beam loss is extremely small when one considers that the tunnel is 53 mi in length and cave exploring is likely to occur only during a small fraction of the time when the accelerator is operating. Also, the likelihood of a beam loss is remote. Special controls with backup redundancy will be maintained to prevent a loss of beam from occurring.

Nevertheless, the total exposures that are predicted in the event of a beam loss, would not pose a hazard to a typical individual when one considers that normal background levels of radiation in Tennessee are approximately 428 mrem/yr. In the case of muon exposures from a beam loss the expected exposure levels for an individual could be near the DOE exposure limit, which is 100 mrem/yr (Volume I, Chapter 6, Section 6.3.2). It is possible that the natural background exposures for active cave explorers are higher because of the exposures to radon and its progeny, which are found in underground locations.

1485.16

As discussed in the Errata to EIS Volume IV, Appendix 15, Section 15.2.3.6, Mebone Cave is a recently discovered cave located within 2,000 feet of the injector area J6 of the proposed Tennessee SSC site. Several bones tentatively identified as elk, horse and/or deer were located in the entrance chamber. One bone, possibly deer, has been split for removal of marrow. Further evaluation of this site is needed to determine its archaeological significance and the potential for impacts.

1485.17

The DOE is committed to the mitigation of environmental impacts of the SSC. In EIS Volume IV, Appendix 11 and the related sections of Volume I, Chapters 4 and 5, the issues related to the new materials provided to the DOE by Dr. Crawford of Western Kentucky University on the Snail Shell Cave system are included in the discussion of sensitive habitat. In the event that Tennessee is selected as the site of the SSC, special studies of the potential impacts to the cave system will be made and included in the site-specific Supplemental EIS.

1485.18

See Comment Responses 500.03, 503.03, 522.07, 522.25, and 522.36.

1485.19

See Comment Response 523.03. Additionally the Tennessee Cave Act will be considered where appropriate.

1485.20

If Tennessee is selected as the SSC site, field investigations similar to those done by Drs. Crawford and Barr, with input from the Nashville Grotto of the National Speleological Society, will be done in all areas of the site. These investigations, to be done as a part of the site characterization in the preconstruction phase, will be used for the purpose of further evaluating potential impacts to the karst aquifer system and the cave ecological systems. Construction-phase mitigations will be evaluated in greater detail during these field studies. The mitigations will be described in a Supplemental EIS.

1485.21

See Comment Responses 500.03 and 509.01.

1485.22

EIS Volume I, Chapter 4, Section 4.7.1 contains a discussion of the ecological resources of the site alternatives. It has been revised to show that underground cave systems found in the karst at the proposed SSC site are a dominant system within the ecological resources of Tennessee.

Discussions of the karst features at the Tennessee site are also presented in EIS Volume I, Chapter 4, Section 4.1 under the topic of earth resources. This section contains comparisons of the earth resources at all of the site alternatives.

1485.23

See Comment Response 503.10, second paragraph.

1485.24

The text of EIS Volume IV, Appendix 11 has been modified to reflect DOF awareness of the requirements of the Tennessee Cave Act (TCA-39-3-1326).

1485.25

See Comment Responses 500.03, 503.03, 522.12, and 522.23.

1485.26

See Comment Response 523.03.

1485.27

Based on information received since the preparation of the DEIS, the description of karst features and the assessment of potential groundwater quality impacts at the Tennessee site has been revised (see EIS Volume IV, Appendix 5, Section 5.6.2.2 and Appendix 7, Section 7.2.3.6). With the available information, qualitative assessments indicate that the potential for groundwater contamination is high as a result of the shallowness of the water table and the existence of karst features. Therefore, careful construction control and appropriate wastewater treatment considering site-specific conditions would be necessary to minimize groundwater quality impairment. If the Tennessee site is selected, more detailed and qualitative assessments would be conducted following extensive hydrogeologic field work, which would be documented in a Supplemental EIS. See also Comment Response 503.03.

1485.28

The potential for the collapse of karst features as evidenced by the existence of sinkholes, is recognized in the EIS (see EIS Volume IV, Appendix 5c, Section 5.6.1.1, 5.6.1.4 and 5.6.1.5). For the proposed Tennessee site, surface water would provide the main source for both the on-site SSC water needs and for the project-induced population growth. Groundwater use would be small, limited to the construction and operations of two remote service areas, and to new residents settling in rural areas. Thus, only negligible effects on water tables are expected due to the project (see EIS Volume IV, Appendix 7, Sections 7.1.3.6 and 7.2.3.6). Also, due to the karst features, extensive field work would be conducted prior to the commencement of construction to assure that dewatering as a result of excavation can be controlled to negligible levels (see Comment Response 509.01). Therefore, it should be possible to avoid the potential collapse of cavities in the karst.

1485.29

Caves close to construction sites will be monitored for damage due to blasting similar to the way aboveground structures will be monitored. Blasters' Handbook (see EIS Volume IV, Appendix 9, Section 9.2) lists a peak particle velocity of 12 inches per second as necessary to cause

fall of rocks in unlined tunnels, considerably higher than the 2.0 inches per second used in the EIS analysis. Using the same 2.0 inches per second limit for blasting vibrations for caves as for structures will result in negligible vibration impacts for caves.

No research has been done on the effects of blasting vibrations on cave fauna, but all research done on other types of fauna indicates that vibrations and noise, at levels higher than anticipated from the SSC project construction, do not cause damage (Fletcher and Busnel 1978). If the proposed Tennessee site is selected for the EIS, additional studies would be done in this area as a part of the Supplemental EIS procedure.

1485.30

There is considerable literature available documenting that the most serious impacts on wildlife of large-scale projects in rural settings, such as the SSC, occur during the construction phase. These impacts, along with potential impacts due to SSC operation, are addressed in Volume I, Chapter 5, Section 5.1.5 of the EIS. If appropriate habitat still exists after installations are in place, many species of wildlife may acclimate to human presence. Table 3-2 of Volume I, Chapter 3 of the EIS indicates that not all construction areas would be permanently disturbed; areas temporarily disturbed would be reclaimed using native vegetation to partially mitigate loss of habitat. Operation of the SSC would not result in any further habitat loss, beyond that ascribed to construction.

1485.31

The commenter's general statement regarding the localized displacement of a critical habitat and its potential impact on endemic species is true. It should also be noted that while ecosystems share many similar processes, each system has a differing sensitivity and resiliency to alterations due to construction of a major project (EIS Volume IV, Appendix 11, Section 11.1.2). However, the EIS notes in Volume I, Chapter 4, Section 4.7.4 that none of the SSC site alternatives is located on or near any of the critical habitats designated by the U.S. Fish and Wildlife Service (USFWS). If the Tennessee site is selected for development of the SSC, formal consultation on threatened and endangered species will continue with the USFWS as specified under the Endangered Species Act (see EIS Volume I, Chapter 6). For preparation of the EIS, the DOE contacted State agencies regarding the presence or absence and sensitivity of the state-protected, threatened, or endangered species where they exist (Volume IV, Appendix 11, Section 11.1.2).

1485.32

See Comment Response 522.25.

1485.33

See Comment Response 503.03 and 522.24.

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1486.01

See Comment Responses 1486.02, 1486.03, 1486.04, 1486.05 and 1486.06. The Illinois State Museum has undertaken a multi-phased program to identify and evaluate the wide range of cultural resources within the proposed SSC site. Records describing previously recorded sites have been reviewed, predictive models have been developed and an extensive field survey has been undertaken. The historic structure survey is complete; approximately 60 percent of the prehistoric archaeological survey is complete. Additional cultural resource compliance procedures, including additional survey resource evaluations and mitigations measures, as necessary, would be undertaken should the Illinois site be selected.

1486.02

See Comment Response 1486.03.

1486.03

See Comment Response 13.02 concerning the approach DOE took to identify and verify data used for the EIS. The data presented in Volume IV, Appendix 15 are based upon varying levels of archival and field research completed prior to the DEIS at each SSC sites. Study intensity ranges from records reviews, to sample surveys, to intensive surveys of large portions of the identified potential impact areas. Archaeological surveys have not been performed in Colorado, Michigan, North Carolina, Tennessee, and Texas. Extensive surveys have been completed in Arizona and Illinois. The information provided in the EIS on cultural resources is at a level of detail consistent with the SSC conceptual design (see flexibility discussion in Volume I, Chapter 3, Section 3.6.1). These data are sufficient for the assessment of the proposed sites. At the selected site, surveys of cultural resources would be completed in order to identify and evaluate remaining cultural resources. Based on the current knowledge of these resources at alternative sites, there is a high probability that identified impacts could be mitigated.

In Illinois, over 60 percent of the SSC site facility have been surveyed. This represents a significant portion of the study area. (At the North Carolina SSC site, no survey has been undertaken). Although precise numbers or locations of additional sites cannot be predicted in the areas which have yet to be surveyed, any archaeological sites discovered will probably be similar in many ways to those identified in the region to date. This can be predicted based on previous analysis of cultural settlement patterns performed in the region. Regardless of which state is selected for the SSC, the survey in that state will be completed and the scientific information gleaned from it. A review and analysis of this ongoing work will be provided in the Supplemental EIS. Site-specific mitigation strategies also will be discussed in the Supplemental EIS.

1486.04

See Comment Responses 1486.01 and 1486.03.

145115003358839

1486.05

See Comment Responses 1486.01 and 1486.03

1486.06

The Illinois site has undergone a comprehensive study regarding the identification of archaeological and historic cultural resources in the project area. Further work is currently underway to identify additional resources and evaluate known resources. If the DOE selects the Illinois SSC site, cultural resource inventories are to be completed. Mitigation measures would be developed to reduce or avoid impacts to significant cultural resources. The results of these studies would be included in the Supplemental EIS. The Illinois State Museum has pursued an extensive and continuous program of cultural resource management pertaining to the SSC site to identify and evaluate potentially impacted cultural resources.

1487.01

Comment noted.

1487.02

See Comment Response 627.01.

1487.03

See Comment Response 979.02.

1487.04

The SSC will be constructed and operated in a manner that will minimize water pollution and will comply with applicable laws and regulations. Potential impacts to water are analyzed in EIS, Volume I, Chapter 5, Sections 5.1.2 and 5.2.3, and in Volume IV, Appendix 7. See also Comment Response 1487.02.

1487.05

Siting criteria for the SSC is found in EIS Volume III, Chapter 2. See Volume I, Chapter 1, Table 1-1 for a comparative analysis of potential adverse environmental issues at the seven alternative sites. Proposers could include Federal or other public lands in their proposals.

1488.01

See Comment Response 1126.05.

1488.02

See Comment Response 773.03.

1488.03

See Comment Response 1126.05.

1488.04

See Comment Responses 13.02 and 1504.01. The impacts of the highways proposed by the State of North Carolina are addressed in EIS Volume I, Chapter 5, Section 5.1.8 (and the corresponding Appendix) and Volume IV, Appendix 14, Section 14.2.1.3.E.1. Secondary impacts of SSC construction and operation are covered in each technical area of Volume I, Chapter 5, Section 5.1 of the impact assessment, and Volume I, Chapter 5, Section 5.2 includes an assessment of SSC's cumulative impact. A more detailed analysis of impacts will be included in the Supplemental EIS for the selected site.

1489.01

Comment noted.

1489.02

Experience at accelerator laboratories in the United States and Europe has been that large, new additions to existing accelerators can be accommodated with ongoing programs. SLAC, at Stanford, has had two large projects, PEP, and SLC, over the past ten years that were managed as add-ons to the ongoing experimental program. Fermilab itself has added a second ring of superconducting magnets in the accelerator tunnel to make a collider out of its original fixed target storage ring/collider machine. CERN, in Geneva, Switzerland, has had a continuing series of major additions to its existing facilities, which is culminating in an electron-positron collider, LEP, in a tunnel about half the size of that for the SSC. The experience to date is that the presence of a large construction project at an existing laboratory does not necessarily impact the ongoing program adversely.

1490.01

Comments noted.

1490.02

See Comment Response 1252.08.

1490.03

See Comment Response 867.03.

1490.04

See Comment Response 1007.01.

1490.05

See Comment Response 1293.05.

1490.06

See Comment Response 41.02.

1490.07

See Comment Response 1314.31.
1490.08

Cultural resource surveys have not been completed at any of the SSC sites; therefore, it cannot be stated at this time which state has the most sites. See also Comment Response 1486.03.

1490.09

Comments noted.

1491.01

Comments noted. Specific responses are provided to each comment.

1491.02

An average of all seven sites was used for the EIS in Volume IV, Appendix 2.

Deeper tunnel projects do not necessarily mean more expense. While the cost of deeper shafts is more expensive than that for shallower shafts, the total amount of shaft construction is far less than the total amount of tunnel construction. The main ring for the Illinois site was sited deep to take advantage of geological materials that are relatively inexpensive to tunnel through which are not present at shallower depths.

1491.03

See Comment Response 284.05.

1491.04

If the SSC were sited in Illinois, there is no reason to believe that the presence of the existing staff would affect the recruitment of scientists to Fermilab in the future. See also Comment Response 1219.03.

1491.05

Staffing concerns related to the operations of the SSC are considered in EIS Volume I, Chapter 5, Section 5.1.8. The Department anticipates

that the SSC, regardless of where it is sited, will attract enthusiastic people with a sense of purpose.

1491.06

See Comment Response 873.02.

1491.07

See Comment Response 864.01 first paragraph.

1491.08

Comments noted.

1492.01

Comments noted.

1492.02

Cost is a consideration for site selection, as outlined in the Invitation for Site Proposals (ISP), Section 3.5, and EIS Volume III. The development of the project cost estimates for the EIS are shown in Volume IV, Appendix 2 and special adjustments for Illinois are defined in Section 2.4.2.2.

However as stated in Section 3.1.1 of the ISP, "the goal in evaluating sites is to select a site that will permit the highest level of research productivity and overall effectiveness of the SSC facility at a reasonable cost of construction and operations and with minimal adverse impact on the environment."

1492.03

See the first paragraph of Comment Response 864.01.

1492.04

Comments noted.

1493.01

The DOE believes that with proper engineering, safety procedures, and mitigation a deep tunnel can be constructed in Illinois in a safe and environmentally sound manner. See EIS Volume IV, Appendix 5, Sections 5.3.1.4 and 5.3.1.5.

1493.02

Impacts from blasting and resulting vibration are discussed in EIS Volume I, Chapter 5, Section 5.1.4.2, which also discusses air blast

overpressure. A monitoring and mitigation plan is outlined in Volume I, Chapter 5, Section 5.1.4.2.A.1. Additional information on blasting and mitigation techniques may be found in the Comment Responses 877.02 and 1278.35. The DOE and its contractors will comply with appropriate safety standards (see EIS Volume I, Chapter 6).

1493.03

See Comment Response 1252.01. The "drift gas" referred to in Comment Response 1252.01 refers to naturally occurring gases such as methane and hydrogen sulfide, although principally methane.

1493.04

The excavated material would be stored for a short period and then hauled away to four quarries (see Figure 10.2.3-5, Appendix 10, Volume IV). The quarries would mix these materials with their own materials and sell the mixed product.

1494.01

The State of Illinois has proposed four quarries for the disposal of excavated material. These quarries would stockpile the excavated material and gradually blend it with their own produced material and sell the combined product. See the discussion in EIS Volume IV, Appendix 10, Section 10.2.3.3.

Discharge of any waters containing fines or leachate from the excavated rock would result in a measurable impact to area streams. Planned holding ponds will minimize this impact but additional measures will be necessary to ensure a negligible impact. Safely handling the huge quantities of finely ground rock and any leachate water presents a challenge, but not an insurmountable one. The disposal of such wastes will be analyzed in the Supplemental EIS for the selected site. The DOE is committed to working with State and Federal environmental agencies to develop mitigations that will protect the environment.

1495.01

Comment noted.

1496.01

EIS Volume IV, Appendix 15, Section 15.1.3.4 has been revised to reflect the suggested deletion.

1497.01

Development or selection of criteria for comparing the seven sites on the basis of potential noise impacts was not done capriciously. The EPA statement quoted in the DEIS (with respect to a lack of legal consensus on acceptable noise levels at residences) is essentially correct even

now, six years after the publication of the referenced document. However, this does not mean the body of knowledge required to establish criteria does not exist. The State of Illinois, for example, has developed and legislated criteria which were determined to be most appropriate for applicable circumstances. In order to provide a basis of comparison between all states, the high annoyance criteria was applied to all of the proposed sites regardless of existing sound levels. In addition, information was presented which defined the areal extent for two different background cases of the increase in background sound level as a result of project activities. Also applicable local laws at the BQL sites were utilized to determine if noise levels produced by the SSC during either construction or operations produced violations or exceedances of those laws. Note that the first two assessment criteria discussed above are applied to all sites in an objective manner, and the third criterion is utilized only when applicable or relevant local laws are identified. It is anticipated that analyses prepared in the Supplemental EIS will utilize more stringent criteria for assessing the potential noise impacts of the project at the selected site. For the purposes of site selection, analyses based on the criteria discussed above are sufficient to obtain an objective comparison of the noise impacts of the project at the site alternatives. Comparison of the sites on the basis of subjective measures, such as the sounds of birds and insects, is not appropriate, as these measures have different values for each individual person.

1497.02

The comment information is consistent with the EIS. The expected noise impacts, including the number of people affected and techniques for mitigating these impacts, are described in detail in Volume IV, Appendix 9, Section 9.1.3.5.B.1.

1497.03

Comment noted. See EIS Volume III, Chapters 2 and 3 for a discussion of the criteria to be used in selecting the SSC site. See also Comment Response 1211.02.

1497.04

E8 was indeed listed among the group of service and intermediate assess areas with the potential to cause high annoyance to people (see EIS Volume I, Chapter 5, Section 5.1.4 and Volume IV, Appendix 9, Section 9.1.3.5). The plots of residences, subdivisions, and schools were developed using information integrated from U.S.G.S. 7-1/2 min current quadrangle maps and observations made by the DOE and its contractors during site visits. A revised analysis of the affected population living near E and F areas at the Illinois site, based on recent aerial photographs (1985-1988), is presented in the final EIS in Volume I, Chapter 5, Section 5.1.4 and in the revisions to Volume IV, Appendix 9.

The Supplemental EIS for the selected site will address the population numbers and distribution at a level of detail which will identify each residence, school, and other institutional structure, its location relative to the SSC facilities, and the number of people associated with it. The Supplemental EIS will also address planned but uncompleted land development as it affects impact mitigation requirements.

1497.05

The number of people in the areas of possible noise impact have been determined by analysis of aerial photographs and included in EIS Volume IV, Appendix 9, Figure 9-20 and Section 9.1.3.5.B. The number has been used in estimating the magnitude of expected noise impacts associated with each construction and operations noise source. The results for Illinois are summarized as follows:

> During construction, the number of people exposed to outdoor noise levels greater than 70 dBA (Ldn), i.e., those who are within 630 ft of the center of an E or F area is estimated to be 454. During this period, the number of people experience levels between 60 dBA and 70 dBA (Ldn) is estimated to be 1,236.
>
> During SSC operations, the number of people experiencing outdoor levels in the range of 55 dBA to 60 dBA (Ldn) is estimated to be 45.

1497.06

See Comment Response 841.02. EIS Volume I, Chapter 2, discusses the purpose and need for action. See also Comment Response 13.02 for a discussion of accuracy of data.

1497.07

See Comment Response 7.02.

EIS Volume I, Chapter 2, discusses the purpose and need for action.

See Comment Response 13.02 for a discussion of accuracy of data.

1497.07

See Comment Response 7.02.

1498.01

Comments noted.

1499.01

Comments noted.

1499.02

See Comment Response 1039.04.

1499.03

The potential environmental effects related to the SSC at the Texas site are identified and analyzed in Volume I, Chapter 5, "Environmental Consequences During the Life of the Project and Mitigative Measures." The impact on water resources is considered in Section 5.1.2 "Water Resources." Specific analysis of the potential for pollution of waters are covered in section 5.1.2.3, "Water Quality." A more detailed evaluation of potential effects on water resources is provided in Volume IV, Appendix 7, Section 7.2.3.7.

Potential effects on other areas of the environment include Air Quality in Section 5.1.3 and Health Hazards associated with radioactive or hazardous materials in section 5.1.6. Possible cumulative impacts are considered in section 5.2, and in particular 5.2.4 on Air Quality and 5.2.5 on Radiation. Unavoidable adverse impacts are summarized in Section 5.4.

1499.04

This information is inconsistent with the following information collected for EIS preparation: the Waxahachie Fire Department maintains three ambulances for emergency services.

1500.01

Comments noted. Specific responses are provided to each comment.

1500.02

See Comment Responses 1278.11 and 1442.51.

Environmental factors, such as noise, air pollution, and traffic (EIS Volume I, Chapter 5, Sections 5.1.3, 5.1.4, and Volume IV, Appendix 14, Section 14.2.1.3) are part of the information used in the site selection process described in EIS Volume III.

1500.03

See Comment Response 1288.02.

1500.04

The EIS recognizes that a groundwater overdraft exists in the region of the proposed Illinois SSC site. This factor would be considered among other factors in selecting the site (see Volume III for a description of the site selection process). See also Comment Response 1279.115 concerning regional overdraft conditions.

1500.05

See Comment Response 870.04.

1500.06

See Comment Response 1381.11.

1500.07

See Comment Response 1275.12.

1500.08

The DEIS incorrectly indicated the number of prairie remnants that would be affected at the proposed Illinois SSC site. The text has been revised to indicate that only seven prairie remnants are located within the 16-township area. Approximately 940 acres of natural systems (including about 900 acres of wetlands) are located within the A, B, and C areas on the Fermilab property (Volume I, Chapter 4, Table 4-15). Plans to mitigate wetlands impacts would be developed in consultation with the U.S. Army Corps of Engineers, as required by Section 404 of the Clean Water Act and analyzed for the selected site in the supplement to the EIS.

1500.09

See Comment Response 997.01.

1500.10

The DOE estimates that locating the SSC in Illinois would require the proposed relocation of 59 businesses (see Volume I, Chapter 3, Table 3-5). The number of those businesses that may decide to close or sell rather than relocate is unknown. However, the SSC-related indirect and induced employment impact in Illinois has been estimated at about 5,000 to 6,000 jobs. The induced economic effects are triggered by direct SSC-related regional spending and consumer spending by workers directly employed by the SSC. This induced economic effect may result in the creation of new businesses in the region as well as increased sales for existing businesses. (See Volume IV, Appendix 14, Section 14.1.3.3.A).

1500.11

As stated in the baseline section of the EIS, the Illinois Region of Influence (ROI) grew slowly between 1969 and 1984, relative to growth throughout the rest of the United States (see EIS Volume IV, Appendix 5, Section 5.3.11.1). More recently, there has been evidence of an increased level of economic growth in the region. This evidence includes decreasing unemployment rates at the same time that the number of workers in the labor force was increasing. For example, the ROI labor force grew by 2.7 percent between 1984 and 1985 while the ROI recorded a drop in unemployment rates from 10.6 percent in 1982 to 6.5 percent in 1987.

DuPage County's labor force grew by 17.3 percent between 1984 and 1985 while the unemployment rate dropped from 8.2 percent in 1983 to 4.1 percent in 1987. Kane County's labor force grew by 4.8 percent between 1983 and 1984 and by 2.3 percent between 1985 and 1986 while the unemployment rate dropped from 12.3 percent in 1982 to 6.1 percent in 1987. Kendall County's labor force grew by 3.6 percent between 1984 and 1985 while the unemployment rate dropped from 11.4 percent in 1982 to 5.5 percent in 1987. This recent trend in the baseline level of growth in the ROI was considered in the socioeconomic assessment.

1500.12

See Comment Response 1276.01.

1500.13

The DOE has fully considered the possible consequences to the health and well being of the public during normal operations of the SSC and under upset conditions, such as a fire in the tunnel or other events resulting in radiation or chemical exposures (EIS Volume I, Chapter 5). The results of these assessments lead one to conclude that even under worst reasonably foreseeable upset conditions, the public would not be exposed to significant levels of radiation or chemicals (EIS Volume I, Chapter 5, Section 5.1.6.3).

The SSC will not generate high-level radiological wastes like a nuclear reactor. The potential exposure levels from the low-level radiological wastes are small enough that they will not pose a hazard to the public even under the worst reasonably foreseeable circumstances (EIS Volume I, Chapter 5, Section 5.1.6.3). Wastes that are generated at the SSC will be disposed of in an environmentally safe manner as required by Federal law and as indicated in EIS Volume I, Chapter 6, Section 6.2.6. See also Comment Response 229.06.

Comment Response 1206.04 provides a detailed discussion of the exposures and risks from an accident involving a loss of beam, which is one of the most serious types of upset conditions at the SSC.

1500.14

Comments noted.

1500.15

See Comment Responses 867.03 and 1215.02.

1500.16

See Comment Responses 1169.04 and 1478.12 (first paragraph).

1501.01

Comments noted.

1501.02

A detailed description of the occupational health and safety programs that will be implemented for construction and normal operations at the SSC is not provided in the EIS. The DOE's commitment to protecting the health and safety of workers and the requirement for developing a worker protection program is indicated in DOE Orders 5480.1B and 5483.1A (see EIS Volume I, Chapter 6, Section 6.3).

The Supplemental EIS will address the plans for mitigating and eliminating exposures to some of the occupational hazards that will be found at the SSC. For example, if the Arizona location is selected as the site for the SSC, the Supplemental EIS will identify some of the mitigative factors to be considered in reducing the hazard from valley fever. These factors would likely be training programs, use of protective equipment, dust suppression methods and safety enforcement.

1501.03

The DOE agrees that a carefully designed and implemented safety and health program is important both during construction and operations of the SSC. DOE Orders 5480.1B and 5483.1A require detailed and comprehensive occupational health and safety plans. These plans will be developed and implemented for the SSC (see EIS Volume I, Chapter 6).

1501.04

The comment on the EIS regarding its adequacy in covering radiological exposures to construction workers and the general public is noted. Precautions would be taken to lower radiation exposures to construction and operations workers to levels that are as low as reasonably achievable (ALARA). However, exposure to radon and its progeny is likely to occur during the construction phase and accounts for virtually all of the known occupationally related radiological exposures that will take place at that time. Shielding from the tunnel lining will not eliminate exposures to radon and its daughters during construction. The anticipated concentrations in the tunnel with a ventilation rate of 0.46 air exchanges per hour have been presented in EIS Volume IV, Appendix 12, Table 12.3.1-39. At the seven proposed sites, the levels range from 0.008 to 0.046 WL (working level) which are within occupational exposure limits of 0.3 WL.

A more detailed analysis of muon penetration and radon emanation based on site-specific density, topography, and radium content of rock would be conducted, after the tunnel is sited in a Supplemental EIS.

1501.05

The projected site-specific total collective population dose equivalent, which is presented in EIS Volume I, Chapter 5, Table 5.1.6-3, ranges from 0.13 to 0.31 person-rem/yr. The collective dose equivalent is small when compared to the background radiation exposure received by a single average American from all sources of radiation, which is 0.360 rem/yr (EIS Volume IV, Appendix 12, Table 12.2.1-1). Also, it should be noted that the dose equivalent to the general public was based on actual measurements from Fermilab. These measurements of radiation levels include a contribution from background radiation. Background radiation was not subtracted from the projected radiation levels and thus contributes to the total dose equivalent of 0.13 to 0.31 person-rem/yr.

The site-specific routes of travel are shown in EIS Volume IV, Appendix 10, Figure 10.1.3-30. The total transportation distance in miles from each proposed SSC site to the assumed low-level radioactive waste (LLRW) disposal site at Richland, Washington, and to the proposed regional compact LLRW disposal facilities are presented in EIS Volume IV, Appendix 10, Table 10.1.3-18.

The site-specific strategies designed to minimize the exposure risk to the general public are minimization of distance traveled, minimization of source term, and solidification of waste (EIS Volume IV, Appendix 12, Section 12.2.3.1.D.2. The dose equivalent and the risk factor are directly proportional to the distance traveled.

The transportation route from the proposed sites to the DOE LLRW disposal facility was based on the guidelines of 49 CFR 177.825, "Routing and Training Requirements for Radioactive Materials" (Volume IV, Appendix 10, Section 10.1.2.3.A.4.d

A Supplemental EIS will be prepared that will address transportation of low-level radioactive waste in more detail for the selected site.

1501.06

Comments noted.

1502.01

Comment noted.

1502.02

The DOE believes that the 45-day public comment period on the draft EIS was sufficient. The format and preparation of the EIS conform to the requirements of the Regulations of of the Council on Environmental Quality.

1502.03

See EIS Volume III, Chapter 3 concerning the site selection discussion. The DOE does not plan to conduct any further public hearings on this EIS. See Comment Response 1126.05. The Supplemental EIS will be on the construction and operations of the SSC at the selected site, and public hearings will be held to receive public comments on the Draft Supplemental EIS.

1502.04

Comment noted.

1502.05

See Comment Responses 278.02 (number of wells that may have to be abandoned), 352.04 (water consumption by project), and 276.04 (groundwater supply and overdraft). Although various impacts are projected for the proposed Michigan site, the selection of the SSC site will depend on an evaluation of many factors, including groundwater impacts, for all candidate sites.

1502.06

An analysis of public finances for the Michigan Region of Influence and the counties of Ingham and Jackson, which incorporates potential impacts to all local jurisdictions including school districts, is found in EIS Volume IV, Appendix 14, Section 14.1.3.4.D. The reported concerns over local educational funding and policies is an existing condition over which the DOE has no control.

1502.07

The cited increase of almost 1,400 pupils (1,374 students in 1992 and 1,262 students in 2000 (see EIS Volume IV, Appendix 14, Section 14.1.3.4.C, Table 14.1.3.4-10) represents potential public school enrollment increases for the entire Michigan Region of Influence, not for a single school district or county alone. Local government finances (including schools) in Ingham County would experience negative fiscal impacts due to the SSC only during the first two years of construction, and positive fiscal effects thereafter throughout the life of the project (see Volume IV, Appendix 14, Section 14.1.3.4.D.2). Fiscal impacts to Jackson County governments would be positive throughout the life of the project (see Volume IV, Appendix 14, Section 14.1.3.4.D.3).

1502.08

Of the 16,025 acres of land that would be required in Michigan to site the SSC, 7,885 would be private land obtained by the State for fee simple transfer to the Federal government and 7,778 would be private land obtained by the State for stratified fee transfer to the Federal government. The loss to each of the primary impact county's tax base is

discussed in Volume IV, Appendix 14, Section 14.1.3.4.D, (also presented are projections of SSC-related net revenues). See Comment Response 1502.07.

1502.09

See Comment Response 658.06, the first three paragraphs.

1502.10

See Comment Responses 658.06 and 880.04.

1502.11

A description of the proposed SSC campus area and service areas including perspectives of the proposed facilities is presented in Volume I, Chapter 3, Section 3.1.1 of the EIS. The impacts of the proposed facilities on the local environment are presented in Volume I, Chapter 5, Section 5.1.4, Noise and Vibration and Section 5.1.10, Scenic and Visual Resources.

It is expected that the campus area would be landscaped to blend into the general setting of the selected site. Additional mitigations that would be considered at the time of detailed design to reduce annoyance to residents include berming, screening, or acoustically fencing the service areas site perimeter, placing maintenance activities inside acoustically treated sheds, and relocating/reorienting the service areas and facilities. Design options such as choice of color and materials of construction to blend the structures with the background may be considered as well as landscaping to enhance screening.

1502.12

The information used in this EIS was furnished by the proposers and represents a reasonably accurate picture of existing conditions at the site or conditions likely to occur at the selected site. Should the proposed Michigan site be selected, a more detailed site-specific analysis would be carried out in a Supplemental EIS. See also Comment Response 19.01.

1502.13

Specific actions for the protection of wetlands would be identified and implemented upon final placement of the collider ring. Possible mitigative measures are discussed in EIS Volume IV, Appendix 11, Section 11.3.4.3, and more detailed information relative to wetland mitigation would be included in the site-specific Supplemental EIS.

The areas of localized groundwater overdraft referred to in the EIS are limited in size and occur in the communities of Lansing and Jackson, the two largest communities near the site. These two communities are also the only areas where existing localized groundwater overdraft is documented by areal declines in water levels (EIS Volume 5, Section 5.4.2.2). The existing or projected overdraft is expected to cause negligible impact on wildlife or wetlands since the overdraft is limited in its areal extent.

1502.14

Information on wastewater treatment and disposal for the proposed Michigan SSC project is presented in EIS Volume IV, Appendix 7, Section 7.1.3.4.

1502.15

See the first two paragraphs Comment Response 627.01.

1502.16

The DOE believes the EIS does reflect a sufficiently accurate picture of the potential impacts to support a decision to select a site for the SSC. The DOE recognizes that further analysis will be needed prior to construction and operations of the SSC at the selected site (see EIS Volume I, Cover Sheet). The Supplemental EIS will be prepared, with additional opportunity for public comment, to address in more detail the impacts of constructing and operating the SSC at the selected site. The DOE believes that the 45-day comment period on the DEIS was adequate. See Comment Response 13.02.

1502.17

See Comment Responses 13.02 and 1126.05.

1502.18

The comment requests the use of a public ballot for the DOE's siting of the SSC. The DOE has followed Federal procurement regulations in the site selection process. The site selection process is described in EIS Volume III, Chapter 1, and Volume I, Chapter 1, Section 1.8.

1503.01

Comments noted.

1503.02

See Comment Responses 710.01 and 1467.04.

1503.03

National priorities for budget expenditures are established by Congress and the President. See Comment Response 0278.08.

Cost estimates for the SSC are found in EIS Volume IV, Appendix 2. Since publication of the DEIS, a more detailed cost analysis has been prepared and is reprinted in EIS Volume III, Chapter 3.

1503.04

Comments noted.

15011514335885

1504.01

See Comment Response 13.02. The DOE believes the EIS is adequate for the proposed action, which is to select a site for the SSC. The DOE recognizes the need for further analysis of potential impacts before a decision is made to construct and operate the SSC at the selected site. Before such a decision, the DOE is planning to prepare a Supplemental EIS that will address in detail impacts of constructing and operating the SSC, and possible mitigations, at the selected site.

1504.02

The U.S. Fish and Wildlife Service has indicated in the comment that they were concerned that environmental studies done in support of the EIS were insufficient to give fish and wildlife resources equal consideration under the law (NEPA). Although there may have been varying degrees of technical data used in preparation of the DEIS, the data used were verified by the DOE as being accurate and sufficient for all sites to allow an assessment of impacts at each site and to provide a comparison of sites. More detail and comprehensive surveys would be conducted at the selected site and would, along with a revised assessment of impacts, be reported in a Supplemental EIS.

Since completion of the draft EIS, the DOE has attempted to obtain additional data for each of the sites in order to better address specific issues, such as the potential presence of protected species and valuable wetlands. For example, a reconnaissance survey has been conducted in Texas of potential nesting habitat of the endangered black-capped vireo and the candidate golden-cheeked warbler. The results of this survey are reported in Volume I, Chapter 5, Section 5.1.5.2.G and Volume IV, Appendix 11, Section 11.3.7.2 of the EIS. Although the survey suggested that there was insufficient habitat for these species, in the event the Texas site is selected, more detailed, confirmatory surveys would be conducted for the presence of these and other protected species, and, if necessary, appropriate mitigative measures would be incorporated into SSC design and development. This information would be reported in a Supplemental EIS.

1504.03

See Comment Response 873.02.

1504.04

For detailed discussion of the impact of traffic on roads in the SSC site area, see Volume IV, Appendix 14, Section 14.2.1.3.G and Tables 14.2.1-13 and 14.2.1-14.

See also Comment Responses 1030.17 and 1278.35 for a discussion of the noise impacts.

1504.05

SSC-related impacts on public services and public finance are discussed for each of the seven sites (EIS Volume IV, Appendix 14). Impacts were assessed for each year from 1989 through 2000 for these and the other socioeconomic impacts considered in the EIS. However, for purposes of brevity, the discussion of socioeconomic impacts typically focused only upon the peak year of construction (1992) and the first year of full operation (2000), the former comprising a worst, reasonably foreseeable case in terms of project impacts in general, and the latter providing an idea of impacts throughout the operating life of the facility. A noteworthy "bust" after the initial "boom-town" period of construction is not anticipated for any of the proposed sites, as increasing numbers of operation workers and their families will begin to replace some of the construction workers and their families.

A degradation of lifestyle need not occur if one is not employed by the SSC, or by one of the service industries directly associated with the facility. As is discussed in the assessment of economic impacts of the project (see Volume IV, Appendix 14, within the section for each site), a number of indirect economic effects would also accompany the SSC. These indirect or secondary effects, such as increased employment, typically are projected to be greater than the direct economic effects of the SSC.

SSC-related effects on the quality of life in local communities and the social well-being of particular groups within those communities will depend in part upon the settlement patterns of SSC-related workers and their families, and in part upon the abilities of local communities to respond to these growth effects. Of particular importance is the capacity of these communities to plan and finance needed facilities and services. Social disruption will vary depending on the rate of population growth that each community experiences.

1504.06

The methodology used to assess the economic activity, labor force, and income effect of the SSC in the Region of Influence (ROI) for all seven sites is presented in Volume IV, Appendix 14, Section 14.1.2. As such, the analysis reflects a conservative estimate, i.e., likely to be an overestimate, of the impacts due to the SSC in the ROI. Conservative assumptions are used in the analysis in order not to underestimate the magnitude of potential impacts.

1504.07

Comment noted. The methodology for site selection, site selection criteria, and the recommended Best Qualified List of sites being considered for the SSC are contained in Volume III of the EIS. The DOE is committed to establishing a full range of intergovernmental relationships to contribute to the successful establishment of the SSC project

in the area of the selected site. The DOE recognizes the essential need of interacting with all levels of governmental responsibility to ensure the elimination or minimization of potential negative impacts, while also providing the opportunity for maximizing the attendant benefits of the SSC project to the host area.

1504.08

Throughout the EIS, references to the hydrogeology of the proposed Texas site generally include consideration of the saturated surficial sediments. However, the statement in DEIS Volume I, Chapter 3, Section 3.4.7, which suggested that the SSC would lie completely above the water table, has been changed to reflect the significance of the shallow groundwater sources.

1504.09

The hydrogeologic conditions encountered beneath the English Channel should be vastly different from those expected at the Texas SSC site. The English Channel tunnel is constructed in saturated media, while most of the SSC tunnel in Texas would be in unsaturated materials. This fact in itself considerably reduces the chances of encountering saturated zones of high secondary permeability.

As stated in EIS Volume IV, Appendix 7, Section 7.2.3.7.A.1, the groundwater inflow is expected to be nearly zero along most of the tunnel. Greater flows (up to 50 gal/min) are expected in areas where the tunnel passes at shallow depths beneath streams, or from isolated fractures of weathered zones in the Austin Chalk. Based on borehole tests, these projected inflows are not anticipated to be great enough to have measurable impacts on local groundwater systems.

The level of investigation conducted for the EIS in Texas is equivalent to that for the other site alternatives, and is consistent with the intended scope of the document. A more detailed site characterization will be conducted for the selected site; the conceptual design and proposed mitigative measures may be modified, as necessary, to conform with the site-specific criteria of the selected site.

1504.10

The State of Texas has proposed to upgrade existing roads and to construct new access roads to most of the SSC facilities, as discussed in EIS Volume IV, Appendix 1, Section 1.2.7.8. The State of Texas would be responsible for upgrading existing roads and bridges to satisfy the SSC transportation needs. Additional information on the local roads will be provided in the Supplemental EIS for the selected site.

1504.11

See Comment Response 19.01.

15011514335888

1505.01

If the farm is in the stratified fee area, minimal surface impacts would be anticipated. Refer to EIS Volume I, Chapter 5 for summary of impacts, including those in stratified fee areas.

If the portion of land is in the proposed fee simple area, impacts at the surface would be greater. See also Comment Response 880.04 regarding land acquisition.

1505.02

For a description of the water table impacts at the proposed North Carolina site, see Volume I, Chapter 5, Section 5.1.2 and Volume IV, Appendix 7, Sections 7.2.3.5.A.1 and 7.2.3.5.B.1. Surface water will supply most of the SSC water requirements, both for the SSC on-site needs and for the off-site population increase. Groundwater would be used only for eight remote service areas and by new residents settling in rural areas not supplied by community water systems. As a result of this limited groundwater use, impacts on water tables are projected to be negligible. Water levels in a few nearby wells may be affected during shaft and tunnel construction as a result of groundwater inflow control measures or water infiltration into the tunnel. Dewatering will be minimized for foundation and shaft construction and since tunnel infiltration would be controlled by grouting and other means, these effects should be minimal and of short duration. Although these are admittedly qualitative assessments, they are sufficient for evaluating and comparing the candidate sites in order to select the SSC site. More detailed, quantitative assessments would be performed and more specific mitigation plans would be developed for the selected site and documented in the Supplemental EIS.

1505.03

An analysis of the population in the Region of Influence of noise generated during construction at E and F areas appears in EIS Volume I, Chapter 5, Section 5.1.4, and in Volume IV, Appendix 9. The results and assumptions used in the study based on 1987 aerial photographs and current census data for North Carolina are summarized as follows in the amended version of the cited section and appendix:

During construction, the number of people exposed to outdoor noise levels greater than 70 dBA (L_{dn}), i.e., those who are within 630 ft of the center of an E or F area, is estimated to be 136. During this period, the number of people experiencing levels between 60 dBA and 70 dBA (L_{dn}) is estimated to be 705.

Because the sound level associated with each source falls off rapidly as the distance from the source increases, the number of people highly annoyed by the sounds of SSC construction will not be the same as the population of the region. From a subjective standpoint, at distances

greater than 6,000 ft from construction sites, specific construction sounds may be identifiable in the normal background, but will not be any louder than the background. As one approaches the construction noise activities, the associated sounds become increasingly dominant. Within 3,000 ft, the construction related sound may completely mask all but the loudest native sounds. At this point the daytime sound level may reach 50 dBA, comparable to the level of normal conversation heard at a distance of 12 ft (see Appendix 9, Table 9-1).

Regarding dust during construction, please refer to Comment Response 1278.11.

The State of North Carolina has proposed to dispose of excavated material at 17 different locations. Each disposal site would be cleared area (3 to 5 acres) within an existing wooded area (15 to 45 acres). At each disposal site, the topsoil would be removed, stockpiled on the site, and used to cover the excavated material as soon as possible. The disposal sites could then be revegetated.

The maximum distance from the shaft to the disposal site is less than 4 mi. There could be as many as 480 truckloads per day of excavated materials if ten tunnel boring machines operate simultaneously.

1505.04

Each disposal site consists of a clearing (3-5 acres) within an existing wooded area (15-45 acres). Trees could also be planted after the excavated material is deposited and covered with topsoil, but the disposal sites would be surrounded by existing trees.

At each disposal site, the topsoil would be removed and stockpiled on the site and later used to cover the excavated earth material from the SSC site and serve as a root bed for revegetation. Please refer to Volume IV, Appendix 10, Section 10.2.3.5.A for details.

1505.05

Comment noted. No decision has been made on whether to proceed with the SSC project. See Comment Response 520.06.

1505.06

Comment noted. See Comment Response 19.01.

1507.01

Dust generation is discussed in Volume I, Chapter 5, Section 5.1.3; water overdrafts in Section 5.1.2; and wetland impacts in Section 5.1.5.

1507.02

The numbers of people in the areas of possible noise impact have been determined by analysis of aerial photographs. The numbers have been used to estimate the magnitude of expected noise impact associated with each construction and operation noise source. The results for the State of Texas are summarized as follows:

During construction, the number of people exposed to outdoor noise levels greater than 70 dBA (L_{dn}), i.e., those who are within 630 ft of the center of an E or F area, is estimated to be 25. During this period, the number of people experiencing levels between 60 dBA and 70 dBA (L_{dn}) is estimated to be 314.

During SSC operations, the number of people experiencing outdoor levels in the range of 55 dBA to 60 dBA (L_{dn}) is estimated to be 19.

The day-night sound level, L_{dn}, is defined in the Glossary, which is located in Volume I of the EIS. The night time period as used in the formulation of L_{dn} is the 9-hr period between 10:00 p.m. and 7:00 a.m.

The Supplemental EIS will describe site-specific mitigation measures that can be implemented to reduce the extent of noise generation by, and propagation from, construction activities and operations of SSC facilities. Implementation of these measures will limit the number of people who will be annoyed by noise, and provide adequate protection where the need is identified for threatened or endangered species. Possible measures are described in EIS Volume IV, Appendix 9, Section 9.1.3.1.C.1 and Volume I, Chapter 3, Section 3.6. Additional information on mitigation techniques can be found in Comment Response 1278.35. Through the application of noise control technology and implementation of administrative controls, noise impacts can be greatly reduced or eliminated altogether. The specific mitigation measures to be implemented will be a function of the selected site.

1507.03

See Comment Responses 1354.03 and 1278.35.

1507.04

The fact that the proposed SSC site is along the migratory route of certain endangered species does not mean that those species would be adversely affected by the project. The project would have to reduce the quantity of some habitat requirement or produce a toxic product to have an adverse effect on the migratory species. Should Texas be selected as the site for the SSC, both the DOE and the USFWS would look carefully into the possibility of impacts to these species, but at present no adverse impacts are foreseen. For additional discussion see EIS Volume IV, Appendix 11, Section 11.3.7.2.

1507.05

See Comment Response 228.04.

1507.06

See Comment Responses 402.01 and 1030.09.

1507.07

Authorization of funding for construction and operation of this facility would be made by the U.S. Congress. Funding for design and construction would probably be authorized by Congress on an annual basis, as has been the case with other accelerator construction and operational funding. If the SSC were to be stopped prior to the completion of construction, an appropriate plan would be developed to secure the facility.

1507.08

See Comment Response 238.03.

1507.09

The EIS is an assessment of effects the SSC would have if constructed at one of the seven alternate sites. It is not a regulatory instrument. The DOE is responsible for the assuring the operations of the SSC are in accordance with applicable statutes and regulations and will implement appropriate environmental health and safety programs for all its contractor operations.

A list of DOE Orders implementing these requirements is given in EIS Volume I, Chapter 6, Section 6.3. Chapter 6 also includes a summary of applicable Federal laws.

1507.10

Stringent requirements will be imposed on SSC construction and operations. See the discussion in Invitation for Site Proposals and the Federal regulations and DOE Orders listed in EIS Volume I, Chapter 6. The DOE requires that construction and operations contractors comply with all applicable Federal, State, and local environmental safety and health regulations, criteria, and standards. Additionally, the DOE's contractors are required to perform periodic performance assessments. The DOE independently conducts in-depth audits of its contractor operations. Regulatory agencies also will enforce compliance with applicable requirements within their juristictions. During operations of the SSC, environmental (air, water, soil) monitoring programs will be assessed on a periodic basis and any necessary mitigative measures taken to preclude violation of applicable standards.

1507.11

The DOE has carefully evaluated all factors affecting siting (see Volume III) and the impacts of the proposed action (see Volume I, Chapter 5).

1507.12

Comments noted.

1508.01

Utility rates affecting SSC siting were taken into consideration in the siting selection (see Volume III).

1508.02

The information on the two electric utility companies noted in comment paragraph 1 is consistent with the statements made in the EIS, Volume IV, Appendix 5, Section 5.1.11.2.8.1.a. Comment paragraphs 2, 3, and 4 concerning past increases in consumer electric power rates are outside the scope of this EIS. In response to comment paragraph 5, the future energy costs were estimated and used in the EIS Volume IV, Appendix 2 to determine construction and operating costs over the life of the facility.

1508.03

Comments noted.

1508.04

The questions about the safety record, violations, and shutdowns of the Palo Verde nuclear plant are noted, but they are unrelated to the SSC since it is a different type of facility. See EIS Volume I, Chapter 2 and Volume IV, Appendix 1. The DOE is confident that the SSC, which is totally unlike a nuclear reactor (see Volume IV, Appendices 1 and 10), can be constructed and operated in a safe manner.

See Comment Response 312.02 for a more detailed discussion.

1508.05

Impacts on automobile insurance rates were not analyzed in the EIS since they are unrelated to the SSC.

1509.01

See Comment Responses 1509.02, 1509.03, 1509.04, 1509.05, 1509.06, 1509.07, 1509.08.

1509.02

If the proposed Colorado site were chosen for the SSC, it is likely that the area neighboring the Last Chance waste site would remain sparsely populated. The SSC campus area would be about 17 mi from the waste site and the closest portion of the ring (underground and unpopulated) would be about 6 mi away. The majority of the increase in residential housing to accommodate the influx of SSC employees and scientists would be far to the north in Morgan County around Fort Morgan and Brush.

1509.03

It is understood that the BFI facility near Last Chance will be a large-scale, commercial, hazardous waste disposal site. Its impact on the SSC project, should the SSC be constructed at the proposed Colorado site, is expected to be minimal. In addition, any population changes that are likely to occur if the SSC is built in Colorado would not significantly alter the siting considerations for the Last Chance disposal facility. See Comment Response 1509.04.

1509.04

The Browning Ferris Industries hazardous waste management facility located near Last Chance, Colorado, will handle hazardous materials, including flammables. Some of the employees working at the waste disposal facility will be at increased risk due to the nature of the materials they will be handling. If trucks delivering wastes to the Last Chance site from points north would use Interstate 76 to State Route 71 south, then residents along Route 71 and near Brush could potentially be affected if an accident and spill occurred. Any significant increase in population due to the SSC project is likely to occur near the towns of Brush and Fort Morgan (see Volume IV, Appendix 14). See also Comment Response 1509.02.

1509.05

Public concerns regarding the Browning Ferris Industries hazardous waste management facility, which are unrelated to the SSC and would not affect the cumulative impact of the SSC, are not the responsibility of the DOE. Hazardous waste disposition from the SSC is discussed in Volume I, Chapter 5, Section 5.1.6.

1509.06

Since the closest point on the proposed SSC tunnel is about 6 mi from the waste disposal site and the campus area of the SSC would be about 17 mi away, there is no likelihood of an impact on the SSC from this site. In addition, any population increase in the tri-county area that would result from the SSC is likely to occur to the north of the SSC site, which is far from the Last Chance facility (see Volume IV, Appendix 14). See Comment Response 1509.02.

1509.07

See Comment Response 1509.08.

1509.08

The information available to the preparers of the EIS does not indicate that there is a high probability of off-site contamination from the yet-to-be-built hazardous waste facility near Last Chance. Since the closest portion of the SSC tunnel would be 6 mi from the waste disposal site, it seems unlikely that leakage from the site would endanger the SSC project.

1509.09

Climate and meteorology are discussed in EIS Volume IV, Appendix 5, Section 5.3.3. Severe weather is specifically addressed in Volume IV, Appendix 5, Section 5.3.3.6. Should Colorado be selected as the site for the SSC, this meteorological information would be used, in conjunction with standard construction scheduling techniques, to ensure that disruption due to adverse weather conditions would be kept to a minimum.

1509.10

See Comment Response 1229.02.

1509.11

The public was first notified of DOE's intent to prepare an EIS on the proposed SSC project through the Advance Notice of Intent (52 FR 16304, May 4, 1987). The Advance Notice was followed by the Notice of Intent (53 FR 1821, January 22, 1988) which again asked for public comments on the scope and content of the EIS. In addition, scoping meetings were held in the vicinity of each of the best qualified list (BQL) sites.

The DOE invited interested persons and organizations to review the draft EIS and provide comments on the content of the document. A 45-day comment period on the draft EIS was provided after the Environmental Protection Agency (EPA) published the Notice of Availability in the Federal Register (Volume I, Forward).

The health impact from the SSC ventilation system is addressed in EIS, Volume IV, Appendices 10 and 12. See EIS Volume I, Chapter 5, Section 5.1.8.5 for a discussion on impacts to rural and other specific population groups.

1509.12

Information presented by the Colorado site proposer group in Volume 7, Section 7.1 of the site proposal, indicates that vibrations caused by

activities at Explosive Fabricators, Inc., will not produce deflections at the site in excess of the criteria delineated in the Invitation for Site Proposals. Existing vibration conditions are an impact of the environment on siting the facility, and will be considered as inputs to detail design if the Colorado site is selected.

1510.01

Comment noted.

1510.02

Strategies and commitments used to meet the Invitation for Site Proposals (ISP) requirements are the responsibility of the proposer. Questions about those strategies and commitments should be directed to the appropriate State agencies. See also Comment Response 710.01.

1510.03

See Comment Response 13.02.

1510.04

See Comment Response 710.01.

1510.05

Of the 14,437 acres of private land that would be required in North Carolina to site the SSC, 6,817 would be fee simple and 7,620 would be stratified fee. The loss to each of the primary impact county's tax bases is estimated in EIS Volume IV, Appendix 14, 14.1.3.5.D.

1510.06

Proposers are responsible for the methods used in fulfilling the requirements of the Invitation for Site Proposals (ISP). Questions about the strategies and commitments of the proposer should be directed to the appropriate State agency. The EIS provides support analysis for a siting decision. Following a decision for site selection, a Supplemental EIS will be prepared by the DOE prior to a decision to construct and operate (see EIS Volume I, Cover Sheet).

See Comment Response 13.02.

1510.07

The DOE's solicitation (Volume III, Chapter 1) allowed the use of State and Federal land. It was the responsibility of the proposer to decide the location to be proposed. Several proposals did include the use of existing State and Federal property.

1511.01

Comment noted. See Comment Response 880.04 for a discussion of land acquisition plans. Social well-being, including stressful reactions to relocations, is discussed in EIS Volume IV, Appendix 14, Section 14.1.3.3.E.1.

1511.02

See Comment Response 1276.01.

1512.01

These comments are consistent with what appears in Volume I, Chapter 3, Table 3-7 in the EIS.

1512.02

See Comment Response 1196.02.

1512.03

See Comment Response 867.03.

1512.04

See Comment Responses 878.04, 1130.07, 1252.14, and 1332.04.

1512.05

See Comment Response 1196.05.

1512.06

See Comment Response 41.02.

1512.07

The comment is accurate in noting that Illinois taxpayers will be affected by the SSC if it is located at the Illinois site. See EIS Volume IV, Appendix 14, Section 14.1.3.3.D.1.

1512.08

See Comment Response 856.06.

1512.09

Comment noted.

1512.10

Comments noted.

1513.01

Attached materials were reviewed in the process of preparing the FEIS.

1513.02

See Comment Response 1390.07.

1513.03

See Comment Response 13.02 concerning the use of data in the EIS.

It is acknowledged in EIS Volume IV, Appendix 14, Figure 14.2.1-6 that U.S. Route 501 and a railroad generally follow the alignment of the ring in the southwest quadrant. However, the exact alignment of the ring will not be known until the DOE agrees to the final placement and design of the SSC. The Supplemental EIS will address the ring alignment and its relationship with roads and railroads in greater detail.

1513.04

See Comment Response 19.01.

1513.05

The number of wells within the SSC footprint in North Carolina was not reported accurately in the DEIS. The State had provided well records which documented 112 wells within 1 mi of the ring centerline and had also noted that wells have only been required to be registered since 1959 and since that time perhaps only half or fewer of the wells drilled have been actually registered. Given the potential for unregistered wells and commenter's input, it is assumed that in excess of 300 water wells may exist within the SSC footprint. However, only a small number of these may be directly affected by the project and required to be closed. The State estimates, based on field surveys, that only about 9 wells (the number reported in the DEIS) would be directly affected and required to be closed because of the SSC. See Comment Response 1390.07 for clarification of criteria for assessing the number of wells closed and consequent revisions to the EIS.

1513.06

See Comment Response 1513.05.

1513.07

The number of wells within the SSC footprint in North Carolina was not reported accurately in the DEIS. State data were adequate for the purposes of this EIS. The State had provided well records which documented

112 wells within 1 mi of the ring centerline and had also noted that wells have only been required to be registered since 1959 and since that time perhaps only half or less of the wells drilled have been actually registered. Given the potential for unregistered wells and commenter's input, it is assumed that in excess of 300 water wells may exist within the SSC footprint. However, only a small number of these may be directly affected by the project and required to be closed. The State estimates, based on field surveys, that only about 9 wells (the number reported in the DEIS) would be directly affected and required to be closed because of the SSC. See Comment Response 1390.07 for clarification of criteria to assess number of wells closed and revisions to EIS.

1513.08

See Comment Response 1513.14.

1513.09

See Comment Response 1390.07, paragraph 5.

1513.10

See Comment Response 19.01 and Volume IV, Appendix 7, Section 7.2.

1513.11

See Comment Response 1513.05.

1513.12

See Comment Response 1390.07.

1513.13

The potential environmental impacts of constructing and operating an SSC at the proposed North Carolina site were evaluated by the DOE on the basis of information provided by the State and additional information available to the DOE, and documented in the EIS. The combined information has been determined to be sufficient for evaluating the proposed site for comparison with other alternatives and for fulfilling NEPA requirement. More detailed evaluation of potential impacts and site-specific mitigative measures will be made for the selected site and will be documented in a Supplemental EIS which will be provided to the public for review and comment prior to commencement of any SSC construction.

1513.14

The DOE feels that the North Carolina site meets all criteria in the ISP. The fact that the site was named to the BQL and was considered as an alternative in this EIS confirms this. See EIS Volume III for a discussion of the DOE's site solicitation and selection process.

1513.15

The data provided in the comment has been considered, along with other data sources, in correcting the estimate of the number of wells in the SSC footprint at the North Carolina site.

1513.16

See Comment Responses 19.01 and 880.04. See also Volume IV, Appendix 13, Section 13.2 and Volume IV, Appendix 4.

1513.17

See Comment Responses 13.02, 710.01 and 880.04.

1513.18

See Comment Responses 710.01 and 880.04.

1513.19

See Comment Response 13.02.

1513.20

Local activities and proposer actions were considered in the site-selection process (see EIS Volume III).

1513.21

Questions about state methods or procedures should be directed to the appropriate State agency. Also, see Comment Responses 13.02 and 1126.05.

1513.22

See Comment Response 1513.20.

1513.23

See Comment Response 13.02. Land use analyses as presented in Volume IV, Appendices 5 and 13, employed two types of data sources: (1) proposer generated data related to acreage affected, number of affected parcels, and number of residential and business relocations required; and (2) publicly available data (Federal, State, regional, and local) on jurisdictional setting, land ownership, land uses, land use plans, land use policies, and land use controls.

A variety of map sources were used in the land use analyses, and references are cited at the end of each appropriate section. Aerial photographs were also employed as a means to verify existing land uses. The aerial photographs consulted for North Carolina are based on imagery flown in 1987.

1513.24

See Comment Responses 13.02, 710.01 and 880.04.

1513.25

The information was furnished by the State of North Carolina (see EIS Volume I, Appendix 4, Section 4.1). It is recognized that exact numbers cannot be precisely determined until the DOE agrees to a final placement of the collider ring and associated areas. The numbers do, however, represent a reasonably accurate picture of conditions likely to occur at the site alternatives (see Volume IV, Appendix 4, Section 4.4).

Land acquisition is the responsibility of the proposer (see Volume IV, Appendix 4, Section 4.4.1). Proposers have all agreed to comply as a minimum standard to the Federal Acquisition Laws (91-646 and 10 CFR 1039, 51 FR 7000). Questions concerning the proposers' SSC land acquisition strategies and commitments should be directed to the appropriate State agency (see Volume IV, Appendix 4, Section 4.3.2).

1513.26

See Comment Responses 710.01 and 880.04.

1513.27

See Comment Responses 710.01 and 880.04.

1513.28

See Comment Responses 710.01 and 880.04.

1513.29

The DOE's concept of stratified fee does not anticipate the use of negative easements. See also Comment Response 1548.68.

1513.30

The EIS uses each state's estimates for the market and/or assessed value of private land that would be transferred to Federal ownership to estimate the property tax losses to local government jurisdictions in primary impact counties. These estimates were used in the absence of any other available information. They were combined with estimates of average real property tax rates in each county using the most recently available data from published state or local financial reports. In North Carolina, the EIS estimates for cumulative annual property tax losses to all jurisdictions are $28,000 in Durham County, $84,500 in Granville County, and $56,000 in Person County. These estimates appear in the EIS in Volume IV, Appendix 14, Section 14.1.3.5.D.

1513.31

See Comment Response 734.01

The issue of the relocation of Camp Butner is a State responsibility. Questions regarding relocation of Camp Butner should be addressed to the appropriate State agency (EIS Volume IV, Appendix 4, Section 4.3.2). Secondary impacts of the SSC on Camp Butner are discussed in the EIS Volume I, Chapter 5, Section 5.2.

1513.32

See Comment Response 880.04.

1513.33

Locations of quarries, mines, and prospects are shown in the Volume IV, Appendix 5, Figure 5.5.1-5.

Carolina Sunroc Quarry is located 6 mi south of the ring footprint on the southwestern side of Butner. At this distance, vibrations caused by blasting and crushing at the quarry should not impact the SSC operations.

1513.34

Comments and questions regarding information contained in the SSC proposal submitted to the DOE by the State of North Carolina are the responsibility of the State and not the responsibility of the DOE. Socioeconomic analyses presented in the EIS are based upon independently collected data. Discussion of current housing conditions in the North Carolina Region of Influence and in Durham, Granville, and Person counties is found in Volume IV, Appendix 5, Section 5.5.11.1.B. Secondary impacts are discussed in the EIS in Volume I, Chapter 5, Section 5.2.

1513.35

State of North Carolina proposal strategies are not the responsibility of the DOE. Questions about proposer strategies and commitments should be directed to the appropriate State agency.

1513.36

The commenter reiterates that there are probably no Federally listed threatened or endangered species in the vicinity of the proposed North Carolina SSC site. Additional information concerning species listed or proposed for listing by the State of North Carolina has been added to the revised Volume IV, Appendix 11. Mention has also been made of sensitive habitats that may contain populations of rare plant life. The assessment of impacts has been revised in Volume I, Chapter 5.

In the event the North Carolina site is selected, unique and sensitive habitats for rare and protected species would be surveyed to determine the presence of such species and to evaluate the potential effects of project development. Results of this research effort would then be addressed in a Supplemental EIS.

1513.37

Before information provided in a State's proposal is used in the EIS, the procedure is to verify the information for accuracy. Additionally, water well records were culled from North Carolina State agency files for additional EIS data. The information in the State proposal discusses the nature of the aquifer and is a summary of well depths, average yields, and depths of commonly reported producing zones. Basically, the primary aquifer at the North Carolina site is the partially weathered and fractured bedrock below the saprolite zone. Below a depth of approximately 150 feet, the openings in the bedrock diminish to the point where the rock will not be a reliable aquifer. Consequently, relatively few wells extend to tunnel depth. A summary of the groundwater regime at the North Carolina site is provided in EIS Volume IV, Appendix 5, Section 5.5.2.2.

With regard to the loss of a well, all States have indicated that where use of a well is lost because of the SSC project, either a new well would be constructed or an alternate water supply would be provided. The only wells that would be thus impacted are wells within the fee simple title areas and wells that penetrate within a 150 ft radius of the collider tunnel. Details concerning specific well locations and proposed mitigation efforts would be provided in the Supplemental EIS for the selected site.

1513.38

Long-term water inflow rates will be much less than the 20 to 50 gal/min 100 ft noted in the comment, perhaps as low as 0.5 gal/min 100 ft (see Comment Response 1513.53). Dewatering is not planned for the tunnel, but may be used for the upper (saprolite/weathered rock) portions of some shafts and experimental hall excavations; some of the need for dewatering may be mitigated by using slurry wall techniques. It is not necessary to have a completely dry tunnel; inflow can be reduced by grouting to a low-enough rate that it can be easily handled by drains and pumps, so the expense of completely lining the tunnel is not warranted. Geohydrologic conditions of the site are discussed in EIS Volume IV, Appendix 5, Section 5.5.2.2.

1513.39

The type of dewatering proposed for some of the SSC excavations has been done in similar geologic settings elsewhere in the Carolina Piedmont and with no subsidence effects.

A brief discussion of the potential for subsidence in North Carolina due to groundwater withdrawals is provided in EIS Volume IV, Appendix 7, Section 7.2.3.5. Subsidence due to groundwater withdrawal elsewhere in the nation is due to collapsible, unlithified sediments; such conditions are not present at the North Carolina site. Essentially, the subsurface stratigraphy at the North Carolina site, a thin veneer of weathered bedrock overlying strong igneous and metamorphic rocks, is not prone to the occurrence of subsidence even if groundwater use is significant.

1513.40

The numerical values quoted from the State of North Carolina proposal were not used in the preparation of the EIS.

1513.41

See Comment Response 786.05.

1513.42

No active mines are located in the footprint of the SSC ring (EIS Volume IV, Appendix 5, Section 5.5.1.6 and Figure 5.5.1-5). One small abandoned prospect (the Cross-Cut Mine) is located about 300 ft north of the ring footprint and about 1,800 ft from the centerline of the collider tunnel. The mine shaft, reported to have been 70 or 80 ft deep, has its bottom at an elevation that is at least 50 ft above the elevation of the collider tunnel and would not be expected to impact the construction. Data on mines and prospects used in the EIS were collated from the U.S. Bureau of Mines Mineral Industries Location System (MILS), Reid (1988b), Carpenter (1976), and DOE SSC Site Task Force site visits. No caves are recorded in geological publications for the area.

1513.43

See Comment Responses 1513.142 and 1513.170.

1513.44

See Comment Response 738.01 with regard to earthquake hazards. Geoengineering conditions are discussed in Volume IV, Appendix 5, Section 5.5.1.4 and Tables 5.5.1-3 and 5.5.1-4. The State of North Carolina submission also tabulates the shaft excavation parameters for the proposed SSC site (Volume III, Table 3-29). Summary-level data in the site proposal were verified by reviewing the basic data and comparing them with comparable independent data. Geology and tunneling conditions at the North Carolina site are within the range of ground conditions that can be handled by existing techniques for underground construction.

1513.45

The observation about the range of elevation along the collider ring being 340 ft is consistent with EIS Volume IV, Appendix 5, Figure 5.5.1-4.

1513.46

At the North Carolina site, the current collider ring profile is within 35 ft of the surface at three locations: the Flat River, Jackson Creek, and Mayo Creek. The collider arc region would need to be acquired in fee simple estate at these three locations. If the 41 acres as cited were acquired and the acquisition were 1,000 ft wide, the length of this property would be roughly 1,800 ft long, or roughly 600 ft long for each low point. This appears to be a reasonable amount; however, the precise amount can not be determined until a detailed design for the SSC is approved. If the North Carolina site is selected as the final site, the exact acreage required will be determined during site-specific design and will be addressed in the Supplemental EIS.

1513.47

The observations on variations in weathered zone depths are consistent with the EIS Volume IV, Appendix 5, Figure 5.5.1-3. To a great extent the thickness of the weathered zone has been extrapolated from widely spaced borings and would need to be verified by careful field studies if the site is selected. Based on the geotechnical data available for this weathered zone (Volume IV, Appendix 5, Tables 5.5.1-3 and 5.5.1-4) the characteristics appear to be within the range of conditions that can be handled by fairly routine methods for both aboveground and underground construction. Construction and operations of the SSC would not be affected by the protrusion of saprolite and unweathered bedrock.

1513.48

The "poorly developed cleavage" referred to on page 3-29 of the North Carolina proposal can result in some mechanical anisotropy in the rock. However, the effect on the strength characteristics will be less than if the rock had a strongly developed slatey cleavage (the metamorphic minerals in the site rocks are described in Volume IV, Appendix 5 Table 5.5.1-1). Overall, the anisotropy due to the poorly developed cleavage will be less than that caused by the bedding. Neither cleavage nor bedding is sufficiently pronounced in the rocks at tunnel depth nor so oriented that it will affect the geometry of the tunnel.

The water table depth for rock unit 7 is listed in Table 3-9, page 3-48 of the North Carolina SSC Proposal Appendix. It is noted that columns 6 and 7 should be reversed for those data on rock unit 7. A summary of the water-bearing properties for the bedrock in the vicinity of the North Carolina SSC site is tabulated in the EIS, Volume IV, Appendix 5, Table 5.5.2-5.

Apparently there was limited data gathered from outcrops of rock unit 2b. This explains the absence of data in Table 3-4 of the North Carolina SSC site submission. Borehole data (borehole E-3), however, support the findings of the geo-engineering conclusions on this small section of the ring geology. Prior to the construction of the SSC, detailed drilling would be conducted on the selected SSC site.

1513.49

The observations are not contradictory. Page 3-39 of the North Carolina SSC site proposal describes the potential for groundwater acidification due to the construction of the SSC tunnel. Pyrite is a mineral composed of iron and a reduced form of sulfur which is stable in an environment lacking oxygen, such as bedrock. When exposed to oxygen, the sulfur changes to an oxidized form called sulfate. If the sulfate is dissolved in water, it may form a dilute sulfuric acid solution (i.e., acid water). The formation of the acid water depends upon a number of factors which include the amount of pyrite present and the surface area exposed. In the North Carolina site rocks there is not a lot of pyrite, and because there will be only limited exposure of pyrite in the walls of the SSC tunnel, there will be no formation of an acid groundwater. The excavated rock material is stored at the surface where it has a larger surface area and where the pyrite is exposed to the oxygen of the atmosphere. However, since the pyrite content of the rocks is so low, there is still only a low potential to form acid water (EIS Volume IV, Appendix 7, Section 7.2.3.5).

Volume 5 of the North Carolina SSC site proposal discusses surface water quality not groundwater acidification. Table 5-5 provides water quality data for seven streams in the area. The pH of these streams ranges from 6.6 to 7.0. The water in these streams would be classified as slightly aidic to neutral. This is normal and typical for streams in that area. The streams listed in Table 5-5 are described as having circumneutral (i.e., around neutral) pH, which is correct. No discussion of acid water is found in the text.

The proposal data also include water quality data for ten selected wells in the area (Table 3-13). The pH values reported range from 6.2 to 7.2 which would be classified as slightly acidic to slightly basic. Again, this range is also normal and typical for that locale and does not indicate any problem with groundwater acidification.

In summary neither the surface water nor the groundwater are acidic, and the project will not change this existing condition.

1513.50

Quartz veins are known locally to be sites of appreciable groundwater flow. However, this does not mean that permeability is directly related to the amount of quartz in the rock. In quartz veins the permeability is due to fracturing of the nearly pure quartz; the vein quartz fractures because it is brittle compared to the rocks on either side of it.

As tectonic stress affects the rocks, the quartz veins are the first places to break. Since they are broken, they allow water to move along them. Hence, some of the best shallow wells tap into water-bearing quartz veins.

Rocks at the site may contain 20 to 40 percent quartz distributed in a matrix of unweathered groundmass minerals rather than as a vein. This mass is integrally "tight", hence there are no preferred pathways for water flow. The quartz is not concentrated in brittle layers that break preferentially when the rock is stressed. In short, there is no intrinsic reason for a rock with 40 percent quartz to be more water-yielding than one that has only 10 percent quartz.

The geohydrologic characteristics for the site rocks noted in the EIS (Volume IV, Appendix 5, Section 5.5.2.2) span a range of values representing rocks both with and without quartz veins and other water-transmitting flowpaths.

1513.51

The two observations in the North Carolina proposal are not contradictory. Carbonate rocks, in dissolving, can contribute to a bicarbonate groundwater. However, it is not necessary to have carbonate rocks to have bicarbonate groundwater. Bicarbonate water also forms as a result of rainwater dissolving carbonaceous organic material in the upper soil layers as it percolates downward to the water table. This is the case at the North Carolina site. A discussion of groundwater quality at the North Carolina site can be found in EIS Appendix 5, Section 5.5.2.2.

1513.52

Although clays are widespread over the proposed SSC site it should be noted that clays with swelling potential are restricted in their areal distribution, and clays are confined to the upper layer of the saprolite horizon. These observations are included in the EIS Volume IV, Appendix 5, Section 5.5.1.4. The geotechnical characteristics of the soils are listed in Table 5.5.1-3 of that appendix.

Groundwater yield capacities are also discussed in the EIS Volume IV, Appendix 5, Section 5.5.2.2 and Table 5.5.2-5. The most water-productive rocks in the site have a low to moderately low water yield (Law Engineering 1987). Clays in the saprolite act as a reservoir, yet their hydraulic conductivities are low (0.0001 to 0.000001 cm/s; Sowers and Richardson 1983). Hence rapid inflow into the tunnel is not expected. Additionally the tunnel's position is such that it is predominantly below the weathered saprolite layer and away from any potential swelling clay horizons. Shafts which may penetrate the saprolite may be "over-excavated" prior to placing the shaft liner. Should any local swelling clay be encountered, normal geo-engineering practices (such as overexcavating and replacing with controlled fill) would accommodate these variations.

1513.53

Water inflow into a segment of tunnel may be appreciable. As the tunnel is being excavated, workers will begin to seal off fractures from which the water is flowing.

Geohydrological characteristics of the North Carolina rocks at tunnel depth (see EIS Volume IV, Appendix 5, Section 5.5.2.2) indicate the initial rate of water inflow into the majority of the tunnel will range from less than 5 to a few tens of gallons per minute (gal/min) per 100 ft of tunnel. The source of this inflow will be principally from fractures in the rock; in crystalline and metamorphic rocks like those at the site, the water has to move through fractures, since sound rock has negligible water transmittability. Additionally, occasional isolated, highly fractured zones may yield still higher flows of water (a few to several hundreds gal/min). However, it is important to note that this is the initial rate of inflow; long-term, continuing rate of inflow after fractures are sealed -- which is achieved in a matter of a few days -- is much less, perhaps averaging 0.5 gal/min/100 ft of tunnel.

The initial rate of inflow is the rate at which water enters the tunnel when the tunnel boring machine (TBM) first passes through the rock; however, this inflow is not allowed to continue unchecked. A grouting crew closely follows the TBM to plug fractures from which water is flowing. This is accomplished by drilling holes into the tunnel wall to intercept the weeping fractures. Then cement grout is forced under high pressure into the drillhole and outward into the fracture to cement the fracture closed. The cement impregnates only a small zone of rock immediately around the tunnel, so it does not change groundwater flow patterns in the aquifer, or affect yields of wells, and it does not alter groundwater discharges to streams. On first-pass grouting, water inflows are easily reduced to one-tenth of the initial inflow rate. If water is still entering the tunnel, additional groutings are done until water inflow is reduced to an acceptable rate.

At any time during tunnel excavation, the initial inflow rate will be experienced only over a tunnel length of 100 ft or less. This is the length of tunnel immediately behind the advancing TBM that has not yet been grouted. The remainder of the tunnel will already have been grouted and the inflow reduced to a very low rate. The long-term inflow rate can be reduced as necessary by applying further water-controlling measures. A series of grouting campaigns will reduce the overall average inflow to perhaps 0.5 gal/min/100 ft of tunnel. This low residual inflow could be used for cooling water or other purposes, or could be permitted and reinjected or discharged.

1513.54

Table 3-27 of the North Carolina proposal shows the anticipated range of support for the various types of rock units at the site. The range for Roxboro metagranite is from 10 percent to 20 percent.

While the proposal suggests that only 10 percent of the tunnels would require rock bolts and shotcrete support, a slightly more conservative support system of 13 percent receiving rockbolts and shotcrete and 5 percent receiving ribs and lagging followed by cast-in-place concrete lining was used for the EIS.

1513.55

The distances from the SSC campus to the airport of 24 mi in the State proposal and 25 mi in this EIS (Volume IV, Appendix 5) are approximate straight line distances. Similarly, the State's estimate of the distance between the SSC and Research Triangle Park may be the shortest. This has no impact on the traffic analysis of this EIS.

1513.56

During the peak year of SSC construction, the EIS estimates that almost 1,200 jobs would be available to local workers in the construction crafts (or building trades) industry within the North Carolina region of influence (ROI). The North Carolina ROI had an annual average unemployment rate of 4.2 percent in 1987 (nearly 38,500 unemployed workers). Furthermore, national unemployment data collected by the U.S. Bureau of Economic Analysis indicate that the rate of unemployment among construction workers is typically almost double the rate among all other workers

It is reasonable to assume that at least 1,200 crafts workers would be available among the 38,500 unemployed workers in the ROI since the construction sector comprised 5.4 percent of the total jobs in the ROI in 1984 (note that 5.4 percent of 38,500 unemployed is 2,079 workers and double that amount is 4,158 workers).

However, in spite of these statistics, it is not anticipated that SSC direct construction workforce would come exclusively from the ranks of the unemployed, or even exclusively from the North Carolina ROI -- 53 percent of the total direct and indirect workforce is expected to in-migrate from outside the ROI during the peak year of construction.

The main factors that trigger in-migration into each ROI in the socioeconomic assessments were unemployment rates and the overall size of the existing labor force. If each of these measures were relatively low, as in the North Carolina ROI, then in-migration into the ROI would be relatively high. In the North Carolina ROI, some direct jobs, and most secondary jobs, would however be obtained by local residents. During peak construction in 1991, in-migrants to the region are expected to obtain nearly 5,000 jobs. Nearly as many, approximately 4,600 are expected to be obtained by local residents. The North Carolina ROI would have the greatest amount of in-migration of the seven sites under consideration during the construction period (see Volume I, Chapter 5, Table 5.1.8-4). The socioeconomic effects of this in-migration is discussed in EIS Volume IV, Appendix 14, Section 14.1.3.5.

Current levels of service for public education, police and fire protection, health care, and all government services combined are presented for the North Carolina region of influence and for Durham, Granville, and Person Counties in Volume IV, Appendix 5, Section 5.5.11.1.C. Each service addressed is developed to some degree in each region discussed from long-established public school systems to volunteer fire departments. As stated in Volume IV, Appendix 14, Section 14.1.3.5.C, services would probably need to be expanded to meet demand generated by SSC development.

1513.58

Comments and questions regarding information contained in the SSC proposal submitted to the DOE by the State of North Carolina are discussed in Comment Response 1513.35. Socioeconomic analyses presented in the EIS are based upon independently collected data. Discussion of current public school conditions in the North Carolina Region of Influence and in Durham, Granville, and Person counties is found in Volume IV, Appendix 5, Section 5.5.11.1.C.

1513.59

See Comment Response 1513.35. Socioeconomic analyses presented in the EIS are based upon independently collected data.

1513.60

See Comment Response 1513.35. The North Carolina proposal information mentioned by the commenter was not used in the analysis in the EIS. Socioeconomic analyses presented in the EIS are based upon independently collected data. Discussion of current economic activity and employment in the North Carolina Region of Influence and in Durham, Granville, and Person Counties is found in EIS Volume IV, Appendix 5, Section 5.5.11.1.A

1513.61

See Comment Response 1513.35. Socioeconomic analyses presented in the EIS are based upon independently collected data.

1513.62

Comment noted.

1513.63

The background sound level and noise sources at the North Carolina SSC-site were discussed in EIS Volume IV, Appendix 5, Section 5.5.5. None of the sources discussed in the comment are expected to change the assumption of a uniform 40-dBA day-night average sound level for the site.

The Butner quarry is addressed in the above section and is located within 6.5 mi of the collider ring. The NASCAR racetrack is not specifically addressed in the EIS, but would be addressed in a detailed Supplemental EIS if the North Carolina site is selected.

1513.64

This comment refers to a discrepancy in the North Carolina State proposal. The information presented in EIS Volume IV, Appendix 5, Section 5.5.11.2.A.2 is correct and agrees with the comment.

1513.65

This comment addresses the content of the North Carolina SSC proposal. See Comment Response 1513.35. Socioeconomic analyses presented in the EIS are based upon independently collected data. Discussion of current population and housing conditions in the North Carolina Region of Influence (ROI) and in Durham, Granville, and Person Counties is found in EIS Volume IV, Appendix 5, Section 5.5.11.1.B. Secondary impacts are discussed in Volume I, Chapter 5, Section 5.2. Stem and Rougemont are discussed in Volume IV, Appendix 5, Section 5.5.11.1. The existing sewage treatment facilities, their location, design flowrates, and available capacities are presented in Volume IV, Appendix 5, Section 5.5.8. The Hillsborough sewage treatment system is outside the 3-county primary ROI and therefore is not considered in the EIS.

1513.66

The North Carolina SSC proposal information was not used in the analysis in the EIS. Socioeconomic analyses presented in the EIS are based upon independently collected data.

1513.67

See Comment Response 1126.05

1513.68

The commenter is correct: the advanced notice of intent was issued in May 1987. This was a "generic" notice published in the Federal Register which sought comment on proposed scope of the Environmental Impact Statement and announced the approach that the DOE would follow in identifying a list of best qualified sites and in selecting a site for the SSC. Since it was not known who would respond to the Invitation for Site Proposals or where proposed sites would actually be, it was not possible to notify landowners in any state.

1513.69

See Comment Response 1513.21.

1513.70

See Comment Responses 710.01 and 880.04.

1513.71

See Comment Responses 13.02 and 710.01.

1513.72

Meetings held by the State of North Carolina in preparing the State proposal were not a requirement of the DOE's solicitation for site proposals. Decisions on places and agenda for such meetings were the responsibility of the State. The DOE conducted an EIS scoping hearing February 9, 1988, in Butner, North Carolina. The public hearing on the DEIS was held in Butner on October 3 and 4, 1988.

1513.73

Comments noted.

1513.74

See Comment Response 1513.21.

1513.75

All submitted materials were reviewed in the process of selection of the BQL (EIS Volume III) and in preparing the Final EIS. See Comment Response 1513.20.

1513.76

See Comment Response 710.01 and 1513.20.

1513.77

See Comment Responses 772.03 and 1259.02.

1513.78

Comment noted.

1513.79

Local support and opposition were considered in the site-selection process (see Volume III).

1513.80

The impacts on local finances are discussed in EIS Volume I, Chapter 5, Section 5.8.4 and in Appendix 14, Section 14.1.3.5.

1513.81

See Comment Response 710.01. Federal lands have been proposed for the location of the SSC as part of the Arizona and Illinois proposals.

1513.82

See Comments Responses 708.03 and 749.05.

1513.83

Educational services provided by local governments (school districts) in the North Carolina Region of Influence, and the primary impact counties of Durham, Granville, and Person, were characterized in terms of the level of service they provide, and in terms of student/teacher ratios (see EIS Volume IV, Appendix 5, Section 5.5.11.1.C). Anticipated impacts on public education due to the SSC were also examined for these areas (Volume IV, Appendix 14, Section 14.1.3.5.C). Due to the large number of local government jurisdictions studied in the EIS, it was not feasible within the bounds of the EIS to analyze the existing capacities and qualities of services for each local jurisdiction. Moreover, the public education provided in each state was not characterized in terms of national trends, and no attempt was made to evaluate current education in terms of quality.

1513.84

See Comment Response 738.01.

1513.85

It has been estimated that the quantity of hazardous waste to be produced at the SSC will be approximately 10,000 gal/yr (EIS Volume IV, Appendix 10, Section 10.1.3.2). Any hazardous waste generated at the SSC will be collected, treated, and stored in accordance with RCRA regulations, and these wastes will be disposed in a RCRA-permitted facility. As indicated in DOE Order 5480.1B, DOE is committed to following all applicable rules and regulations governing the handling and disposal of hazardous waste. RCRA regulations are intended to protect the public from the hazards of these wastes.

1513.86

A traffic analysis for the affected major roads in the SSC area is presented in EIS Volume IV, Appendix 14, Section 14.2.1.3. An analysis of traffic within Durham was not considered to be necessary due to the low increase in traffic. Population and, therefore traffic, is projected to increase in the region of influence by up to 0.8 percent during construction and 0.7 percent during operations over levels projected to exist without the SSC.

1513.87

See Volume IV, Appendix 4 for a presentation of parcel maps as submitted by the State proposer group for incorporation into the EIS.

1513.88

Funding for the current phases of fiscal year 1989 work has been authorized by the Congress of the United States. Funding for future design, construction, and operations of the SSC facility will be authorized on an annual basis for succeeding fiscal years.

A more precise decommissioning plan is not possible at this time for reasons stated in Volume IV, Appendix 3.

The stated purpose of the EIS is "to select the site for the Superconducting Super Collider." A Supplemental EIS will be prepared for the construction and operations of the selected site.

1513.89

The need and purpose for the SSC are addressed in EIS Volume I, Chapter 2.

During the final design period, the DOE will strive to locate all facilities to achieve a minimum of disruption to individuals and the environment in carrying out the project.

1513.90

See Comment Response 1126.05.

1513.91

See Comment Responses 13.02 and 710.01.

1513.92

Should North Carolina be selected as the SSC site, localized land use analyses and impact assessments would be evaluated in the Supplemental EIS.

1513.93

See Comment Responses 1513.92 for a discussion of land use concerns. Although the DOE will acquire title to land in this area, this will not preclude the maintenance of easements for utility lines such as a water main.

1513.94

See Comment Response 1513.92.

1513.95

See Comment Response 1513.92.

1513.96

See Comment Responses 710.01 and 880.04.

1513.97

See Comment Responses 13.02 and 1513.25, paragraph 1. Sociological impacts are discussed as part of quality of life assessments and are provided in Volume IV, Appendix 14, Section 14.1.3.5.E.

Comment Response 1230.03 addresses psychological impacts.

1513.98

The DOE agrees that economic impacts can be projected with more certainty than can sociological impacts. Socioeconomic analyses presented in the EIS are based upon independently collected data. Discussion of current economic activity and employment in the North Carolina Region of Influence and in Durham, Granville, and Person Counties is found in Volume IV, Appendix 5, Section 5.5.11.1.A.

1513.99

Comment noted.

1513.100

The EIS notes that residential relocations of rural, non-farm residents would occur in certain portions of the North Carolina Region of Influence as a result of the SSC, and singles out the Rougemont area as one case in point (see EIS Volume IV, Appendix 14, Section 14.1.3.5.E). Morever, it is anticipated that replacement properties providing equal satisfaction may be difficult to find, and that certain characteristics of the area's rural character would be altered as a result of changes associated with the SSC. Major facets of these impacts would be "sociological/psychological" in nature. Within the context of rural, non-farm residents, the EIS would concur that Rougemont would be one of the areas most impacted by the SSC.

1513.101

The proposer States have the responsibility for all land acquisition and relocation services (see EIS Volume VI, Appendix 4, Section 4.1).

Social well-being including stressful reactions to relocations is discussed in the EIS Volume I, Appendix 14, Section 14.1.3.3.E.1. Questions concerning the proposer's authority to mitigate such impacts should be directed to the appropriate State agency (see Volume IV, Appendix 4, Section 4.3.2).

The proposer States have the responsibility for all acquisition and relocation services. Until the DOE establishes the final placement of the collider ring and associated areas the exact acreages, parcels, and ownership cannot be determined precisely. However, the numbers used represent a reasonably accurate picture of conditions likely to occur it the site were selected for the SSC project (see EIS Volume IV, Appendix 4, Section 4.4) and Comment Response 1513.37.

1513.102

See Comment Responses 710.01 and 880.04.

1513.103

To the extent that crop quotas may have a value related to land to be acquired, resolution of that matter will be the responsibility of the state proposer who is responsible for land acquisition.

1513.104

The proposer States have the responsibility for all land acquisition and relocation services. All proposer States have agreed to comply as a minimum standard to the Federal acquisition laws (91-646 and 10 CFR 1039, 51 FR 7000). Questions concerning the proposer State's SSC land acquisition and relocation services strategies and commitments should be directed to the appropriate State agency (Volume IV, Appendix 4, Section 4.3.2). See also Comment Response 744.01.

1513.105

See EIS Volume I, Chapter 5, Section 5.1.8.5 for a description of the potential impact on affected landowners who may be required to relocate. See Comment Responses 710.01 and 880.04.

1513.106

Compensation exchanged for property is considered a standard commercial activity and is not an infringement on the separation of Church and state.

The DOE recognizes the sensitive factors associated with disturbances created by the relocation of cemeteries. Possible impact on the cemetery is noted in EIS Volume IV, Appendix 14, Section 14.1.3.5.E.

1513.107

See Comment Responses 880.04 and 1259.02.

1513.108

See Comment Responses 1513.102, 1513.103, 1513.104, 1513.105, 1513.106 and 1513.107.

1513.109

See Comment Response 1259.02.

1513.110

It is recognized that relocation has the potential to be a major life event for people. The compensation policies for relocations (EIS Volume IV, Appendix 4) provide for mitigation in terms of financial compensation. However, other considerations are also important, such as emotional ties, which differ from those which can be monetarily compensated. As a result, there may be a net adverse impact to individuals.

Regarding the responsibility to acquire land for the SSC, see Comment Response 880.04.

Regarding SSC-related effects on the quality of life in local communities, see Comment Response 1107.04.

Regarding the identification of specific tracts needed for the SSC, see Comment Response 710.01.

1513.111

See Comment Responses 710.01 and 880.01.

1513.112

See Comment Response 1513.30.

1513.113

The comment is consistent with the discussion of the Northern Parkway and Campus drive in the EIS Volume IV, Appendix 14, Section 14.2.1.3.E.

1513.114

See Comment Responses 710.01 and 880.04.

1513.115

Baseline population projections for the North Carolina Region of Influence (ROI) indicate that the area will grow steadily over the next two decades (EIS Volume IV, Appendix 5, Section 5.5.11.1.B). Although projections were not prepared for individual counties, the EIS states that steady growth is anticipated in Durham County, generated largely by the continued growth expected for the city of Durham.

With regard to SSC-related population impacts in an area already experiencing substantial population growth, two perspectives may be taken. One is that impacts of project-related increases will be relatively less in an area already experiencing impacts of population growth than in an area whose population is stagnant. Moreover, an area which is growing presumably would have planning mechanisms in place to help mitigate impacts associated with growth, thus more easily accommodating population increases due to a particular project. A second perspective is that project-related growth in an area whose population is already increasing would serve to make a bad situation even worse -- in essence attempting to fit still more people into an area trying to cope with growth due to other developments. The present comment appears to consider the second perspective to the exclusion of the first.

The EIS notes that one result of SSC-related population growth in Durham County, namely the increased demand for year-round housing, could strain the county's capacity to absorb project-related in-migrants (Volume IV, Appendix 14, Section 14.1.3.5.B). However, these impacts are not projected to exceed the county's ability to mitigate them. It should be noted that compared to growth anticipated in Durham County without the SSC (such as that discussed in the comment) project-related growth would constitute a relatively small amount of additional people (Volume IV, Appendix 14, Section 14.1.3.5.B).

The EIS public finance analysis, which incorporated anticipated increases in public services due to the SSC, indicates net fiscal impacts on Durham County would be negative during the first three years of project construction, and positive thereafter (Volume IV, Appendix 14, Section 14.1.3.5.D). SSC impacts on public services and transportation, also discussed in the EIS (Volume IV, Appendix 14, Sections 14.1.3.5.C and 14.2.1.E, respectively), are expected to be within manageable levels.

1513.116

See Comment Response 1291.03.

1513.117

Contrary to the commenter's statement, Durham County received approximately 57 percent of total revenues in 1987 from taxes (including taxes other than those on sales and property), Granville County received

approximately 70 percent of total revenues in 1987 from taxes (including taxes other than those on sales and property and licenses and permit fees), and Person County received approximately 72 percent of total revenues in 1987 from taxes (including taxes other than those on sales and property and licenses and permit fees).

Estimates of additional capital expenditures required by local jurisdictions to accommodate SSC-related population increases were made cumulatively for all jurisdictions within each of the primary impact counties in North Carolina. Local governments in the three primary impact counties were projected to have a positive net fiscal impact during construction and operation of the facility, except during the first three years of construction. The projected negative impact in the three counties during the early years of the project would be offset by the positive impact in later years. Furthermore, if local jurisdictions are able to obtain financing for SSC-related capital improvements through bonds, the negative impacts during the early years of construction could be deferred to later years when a net positive impact is projected.

Additional revenues were projected in each of the primary impact counties from spending by direct SSC workers who would have greater than average baseline earnings. Only workers anticipated to reside within each county were included in projection of these additional revenues -- workers commuting from outside each primary impact county were not included in this projection.

Additional details of the assessment of impacts of SSC construction and operation on both State and local government finances are presented in EIS Volume IV, Appendix 14, Section 14.1.3.5.D.

1513.118

The EIS projections indicate local governments in the three primary impact counties in North Carolina would incur a positive net fiscal impact during construction and operations of the SSC facility, except during the first three years of construction. The projected negative impact in the three counties during the early years of the project would be offset by the positive impact in later years. It may be possible for local jurisdictions to obtain financing for SSC-related capital improvements through bonds, thereby deferring the negative impacts during the early years of construction to later years when a net positive impact is projected.

Additional detail of the assessment of impacts of SSC construction and operations on both State and local government finances is presented in the EIS in Volume IV, Appendix 14, Section 14.1.3.5.D.

1513.119

Educational services provided by local governments (school districts) in the North Carolina Region of Influence and in Durham, Granville, and Person Counties were analyzed based on a "level of service" indicator in

general education employment and by student/teacher ratios. These both are simply ratios between government jobs in the education or instruction sector, and the population they serve. The ratio concept is not without flaws and does not denote a numerical ranking or a quality rating of the service provided. The measure is useful as an indicator of the level of impact by which regional population changes would affect the need for local services. Volume IV, Appendix 14 indicates that Durham, Granville, and Person Counties would all need additional public school classroom space as a result of the SSC.

The EIS analysis estimated local government capital improvement expenditures based on projected SSC-related population growth in each primary impact county. Data collected from more than 3,200 municipalities and 4,000 school districts in the United States indicate a relationship between population growth rates and spending for capital improvements by local government jurisdictions. This information, provided in a 1981 report prepared by the President's Economic Adjustment Committee, was used as the basis for the EIS capital improvement projections.

The EIS estimates of required increases in general education and public school instructional employment, necessary to meet future demand, only consider demand related to SSC development. Likewise, estimates of capital facilities requirements only consider the costs to accommodate SSC-related growth. The present situation of reported overcrowding in schools and noncompliance with the "Basic Education Program" in Durham County and elsewhere in the North Carolina Region of Influence is an existing condition which would be present with or without SSC siting in the region. The SSC-related growth would contribute to this situation (see discussion of cumulative impacts in EIS Volume IV, Appendix 14, Section 14.1.3.8.E for more details).

1513.120

Potential employment opportunities arising from SSC development are discussed in Volume IV, Appendix 14, Section 14.1.3.5.D. Employment opportunities associated with the SSC in North Carolina would be available to anyone possessing the qualifications to fill these jobs and who seek the jobs.

1513.121

The general comments regarding reduction in agricultural activities and the increase in manufacturing and services are consistent with the EIS Volume IV, Appendix 14, Section 14.1.3.5.

Work force in-migration due to the SSC is expected to depend on a broad range of factors. These are discussed in EIS Volume IV, Appendix 14, Section 14.1.2.3.B. It was not possible to predict with certainty the extent of local hiring and worker in-migration in each of the siting regions in the context of these many factors.

1513.122

Comments noted.

1513.123

Although it is true that some of the SSC construction and operation jobs may require skills that would preclude local residents from obtaining the work, only those jobs that could be obtained by local residents were included in the EIS socioeconomic assessment. The two main factors that trigger in-migration into each Region of Influence (ROI) in the reference case socioeconomic assessments were unemployment rates and the overall size of the existing labor force. If each of these measures were relatively low, as in the North Carolina ROI, then in-migration into the ROI would be relatively high.

In the North Carolina ROI, some direct jobs, and most secondary jobs, would be obtained by local residents (see EIS Volume IV, Appendix 14, Section 14.1.3.5.A). During peak construction in 1991, in-migrants to the region are expected to obtain nearly 5,000 jobs. Nearly as many, approximately 4,600, are expected to be obtained by local residents. During operations, beginning in the year 2,000, approximately 3,490 jobs would be obtained by in-migrants to the region, and about 2,910 jobs would be taken by local residents.

Additional details on projected employment impacts of the SSC in the North Carolina ROI, and estimates of the portion of these employment opportunities likely to be filled by in-migrant workers, are presented by year (1989-2000) in EIS Volume IV, Appendix 14, Section 14.1.3.5.A.

1513.124

If the North Carolina SSC site is selected, residents of the North Carolina Region of Influence with equivalent educational and work experience would have a locational advantage over other persons seeking SSC-related jobs. These residents could be trained during the eight years of SSC construction in preparation for SSC operation jobs. In contrast to the comment's depiction of low average levels of education in the region (based on cited statistics for Granville County alone), the North Carolina region's adult population contains a high percentage of college graduates.

1513.125

Secondary jobs related to siting the SSC in the North Carolina Region of Influence are estimated in the EIS analysis. These estimates are presented in Volume IV, Appendix 14, Table 14.1.3.5-2. As postulated in the comment, many of these jobs are in the trade and services sectors. Public employment impacts are presented in Volume IV, Appendix 14, Section 14.1.3.5.C. Fiscal impacts to host counties are addressed in Volume IV, Appendix 14, Section 14.1.3.5.C.

1513.126

EIS Volume I, Chapter 3, Section 3.3 presents no-action scenarios. A comparison of these scenarios with project development scenarios as provided in Volume IV, Appendix 13 measures lost opportunity costs. In so doing, alternative investment and development opportunities considered to be lost can be ascertained. By the same token, the impacts associated with not implementing the SSC project are considered as costs of lost opportunities and are discussed in EIS Volume I, Chapter 5, Section 5.3.1. Economic and employment conditions with and without the SSC project are discussed in EIS Volume IV, Appendix 14, Section 14.1.3.5. It is anticipated that new job formation caused as a result of the SSC project will afford employment opportunities to both local residents and newcomers on an equal basis.

Farms and businesses that would be required to relocate would not be lost, but simply moved to new locations. See EIS Volume IV, Appendix 4 for a discussion of land acquisition plans, including the State proposal's need to comply with federal laws on property acquisition and relocation assistance.

1513.127

See Comment Responses 1513.120, 1513.124, and 1513.126.

1513.128

The fiscal policies of the State of North Carolina are not within the responsibilities of the DOE. ISP requirements for State support are summarized in EIS Volume III, Chapter 1. Regarding the North Carolina National Guard facilities, see Comment Response 734.01. Secondary impacts are discussed in EIS Volume I, Chapter 5, Section 5.2.

The schedule and sequence for delivery of title to land are discussed in EIS Volume I, Chapter 3, Section 3.1.3.

The requirements for providing the required land are covered in the ISP, Section 2.2.2.1 and in EIS Volume IV, Appendix 4.

1513.129

See Appendix 11, Section 11.3.5. The referenced material has been reviewed in the process of preparing the Final EIS. At the selected site, a more detailed evaluation of identified candidate, threatened, or endangered species would be conducted during the preparation of the Supplemental EIS.

1513.130

Present information about habitat availability as reported in EIS indicates that there are no known federally listed threatened or endangered species at the proposed North Carolina SSC site although migratory range of the bald eagle and peregrine falcon includes the site region. The endangered plant, harperella, is known to occur in Granville County in the site area. Additional information concerning the species listed or proposed for listing by the State of North Carolina has been added to EIS Volume IV. Appendix 11, Section 11.3.5.2. Mention has also been made of sensitive habitats that may contain populations of rare plant life. The assessment of impacts has been revised in Volume I, Chapter 5, Section 5.1.2.2.E and includes the species listed in the comment.

In the event the North Carolina site is selected, site habitats would be surveyed to determine the presence of rare and protected federal candidate and State-listed species and to evaluate the potential effects of project development. Results of these studies would be presented in a Supplemental EIS.

1513.131

The comment questions information in North Carolina's SSC site proposal. Before information provided in a State's proposal is used in the EIS, the procedure is to verify the information for accuracy by checking independent sources. Some independent sources of data on groundwater use are noted as references in EIS Volume IV, Appendix 5, Section 5.5.2.

Section 5.5.2 discusses the existing groundwater and surface water resources at the North Carolina site. A discussion of the impact of the SSC project on surface water resources at the North Carolina site is found in EIS Volume IV, Appendix 7, Section 7.1.3.5. A discussion of the impact of the SSC on groundwater resources is found in EIS Volume IV, Appendix 7, Section 7.2.3.5. Increased water use due to the project will not have a significant impact on water supply in the region. This is because a large amount of the water supply would derive from existing reservoirs and is well within the current excess capacity of those reservoirs (EIS Volume I, Chapter 5, Section 5.1.2.4).

1513.132

As discussed in EIS Volume IV, Appendix 14, Section 14.1.3.5.B, the population of Durham County would grow as a consequence of locating the SSC at the proposed North Carolina site. Associated impacts on Durham County public service infrastructure are discussed in Section 14.1.3.5.C of the aforementioned appendix, while impacts on other types of infrastructure (transportation and utilities) are examined in Section 14.2.1.E. Careful planning would enable appropriate jurisdictions to take steps to mitigate these anticipated impacts, and thus minimize the disruption to county residents.

With regard to concerns about the proposed North Carolina SSC site occurring in a watershed, aspects of the geology and hydrology of the site are discussed in Volume IV, Appendices 6 and 7, respectively.

1513.133

See Comment Response 707.04. The North Carolina Soil Conservation Service indicates to the DOE that none of the 4,374 acres of prime farmland and 2,265 acres of important farmland listed on the U.S. Department of Agriculture Form AD-1006 is under the protection of the Prime Farmland Preservation legislation passed by the North Carolina General Assembly in 1986.

1513.134

Surface runoff, surface erosion and associated mitigative measures are discussed in EIS Volume IV, Appendix 7, Section 7.1.3.5 and Volume I, Chapter 3, Section 3.6. The SSC may result in localized increases in surface runoff and surface erosion. Detention basins will be used, if necessary, to control surface runoff. Sediment basins and sediment traps will be used, if required, to mitigate any potential siltation downstream from SSC construction sites.

1513.135

Radon is a decay product of naturally occurring radium in soils and rocks. Available data indicate that there are two specific geologic regions where high radium soils/rocks are encountered in U.S.: the Piedmont and Coastal Plain providences in Georgia, South Carolina, North Carolina, and New Jersey; and a northcentral area consisting of parts of Wisconsin, Missouri, Illinois, Minnesota, and Iowa.

Existing data on the relationship between cancer risk and exposure to waterborne radon are scarce and nonconclusive. The great risk to health from radon occurs when the radioactive gas is inhaled. If you regularly drink household water containing radon, it is not considered a health risk ((EPA, "Removal of Radon from Household Water," U.S. EPA, Washington, DC, OPA-87-011, Sep, 1987). Waterborne radon is therefore a problem only when the radon is released from the water and enters household air. Maintaining a low radon level in water may be accomplished by treating water. Aeration systems, granular activated carbon (GAC) tanks, and storage for decay have been demonstrated to be effective methods for reducing radon levels in water. The U.S. EPA has not established a waterborne radon standard for potable water yet.

The health impacts from radiation during SSC construction and operations have been assessed in EIS Volume IV, Appendices 10 and 12. There are no measurable adverse impacts from cumulative effects of exposure to radon in drinking water and exposure to radiation from SSC operations. The dose equivalent from SSC operations is primarily through the air pathway and is less than 0.001 percent of that from background radiation in North Carolina.

1513.136

The DOE is committed to construct and operate the SSC in compliance with applicable statutes and regulations (see EIS Volume I, Chapter 6). A regulatory compliance plan will be prepared by the DOE for the selected site prior to construction.

The environmental consequences of the SSC and the proposed mitigative measures have been addressed in the EIS. Volume I, Chapter 5 includes a comprehensive evaluation of four types of impacts on water resources in Section 5.1.2: runoff and erosion (including sedimentation impacts on streams); floodplains and flood risk (in accordance with 10 CFR 1022); water quality (both direct impacts of any facility emissions and indirect effects of spoils leachate or soil contamination), and water use (both surface and groundwater). Additionally, detailed water resources assessments for each site alternative are provided in Volume IV, Appendix 7.

Detailed evaluation of water supply availability is presented in EIS Volume I, Chapter 5, Section 5.1.2.4 and Volume IV, Appendix 7, Section 7.1.3.5.G.

As stated in EIS Volume IV, Appendix 7, Section 7.1.2.2, the presence of impervious surfaces (such as parking lots) may locally increase surface runoff. These areas will be relatively small (up to a few acres) and may be dispersed around the ring; therefore, net impacts are likely to be small. If site-specific design studies indicate that paved areas will have an adverse effect on local runoff and erosion, a variety of mitigations are possible, including relocating the paved area, providing drains and catchment basins, and using a porous pavement. See also Comment Response 1272.02.

1513.137

See Comment Responses 708.03 and 749.05.

1513.138

According to the ISP (DOE/ER-0315, Invitation for Site Proposals for the Superconducting Super Collider (SSC), April 1987, U.S. Department of Energy, p. 59), the typical daily water needs for the SSC will be 250 gal/min on average for potable water and 2,200 gal/min as a peak level for industrial water. A lower capacity to supply industrial water is acceptable if certain electrical power requirements are met. It is unlikely that the SSC will reach a consumption rate of 3 million gal/day, given its current design.

One of the primary needs for industrial water at the SSC is for cooling systems, such as operation of cooling towers. These systems operate independently of the facilities of the SSC in which radioactivation can occur, and therefore there will be no radioactive contamination of the water used in cooling towers. See Comment Response 503.08 for more information.

Wastewater from the SSC will be handled in several ways. Conventional liquid wastes generated in the campus and injector area from sewage and cooling towers will be approximately 150,000 gal/day and will be discharged into a central sewage treatment plant. Effluent from this plant will be treated and discharged in accordance with National Pollutant Discharge Elimination System (NPDES) permit requirements. Wastewater from other SSC facilities will be treated locally in other sewage treatment facilities. The State of North Carolina did not make specific recommendations on treatment of industrial wastewater, such as blowdown from cooling towers, and because precipitation rates exceed evaporation rates at the proposed site, the use of evaporation ponds is not feasible (EIS Volume IV, Appendix 10, Section 10.3.3.3). Therefore, it is assumed that treatment systems, such as vacuum compression brine concentrator units or side stream softening, would be used to dispose of blowdown wastes. See also Comment Response 503.08.

Regarding the comment that water will be used to cool the magnets and could become activated, EIS Volume IV, Appendix 10, Table 10.1.3-14 summarizes the major components of the SSC that can become radioactive during normal operations. The only water associated with cooling that could develop a significant quantity of radioactivity is the cooling water in the beam absorbers. Any water that has been in an active beam area and therefore has the potential of containing accelerator-produced radioactivity will be analyzed for radionuclides and handled accordingly. See also Comment Response 1513.192 regarding treatment and disposal of tritium.

1513.139

Neutron bombardment of ground- water may occur if the hadronic cascade, which includes neutrons, interacts with the soil. This has been evaluated for the worst case, which would be a beam loss at three times the design intensity (see Volume IV, Appendix 12, Section 12.2.3.1.C). Tritium is produced by neutron activation; it has a half-life of 12.3 years and it migrates with the groundwater since it is part of the water. Sodium-22 is produced by protons and it has a much shorter half-life of 2.58 years. A thorough analysis of the consequences of a beam loss accident and the production and migration of accelerator-produced radionuclides was included in EIS Appendix 12. The consequences of drinking water which is in the direct line of the radionuclides produced was studied and presented in Volume IV, Appendix 12, Section 12.4.1.1. If an individual were to use as a sole source of drinking water a well located 50 meters away, the maximum dose equivalent for an entire year would range from 0.0098 to 0.5 mrem. To put this in perspective, the EPA standard for public drinking water is 4 mrem per year and the dose equivalent from background radiation is approximately 360 mrem per year.

1513.140

At the time of decommissioning, all fuel storage tanks at the service areas and areas not planned for future use will be removed. Fuel storage tanks at the campus area necessary for future use goals would be left in place.

Decommissioning procedures to remove potential hazards are summarized in the EIS Volume IV, Appendix 3 and discussed in more detail in Reference I of Appendix 3.

1513.141

The North Carolina SSC proposal was determined to be responsive to the Invitation for Site Proposals. The EIS is not based solely on data in the site proposals. Data sources used include Federal agencies, State agencies and organizations, privately or corporately funded sources, and the State proposals.

Siltation and sedimentation impacts to surface water and mitigative measures are discussed in Volume IV, Appendix 7, Section 7.1.3.5 and Volume I, Chapter 5, Section 5.1.2.

1513.142

The impact of soil erosion and stream sedimentation caused by the SSC project will be mitigated by minimization of disturbed areas, rapid revegetation, and well-maintained sediment basins. With implementation of proper mitigative measures, the impacts are expected to range from negligible to measurable but will generally be short-term and will not be significant. A detailed discussion of impact mitigations is presented in Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.2.1 and Volume IV, Appendix 7, Section 7.1.2.2.D.2.

1513.143

See Comment Response 153.142.

1513.144

The State of North Carolina has proposed that the excavated material could either be disposed of at 17 different locations or could be sold or discounted to local producers of aggregate or some combination of these dispositions. See Volume IV, Appendix 10, Section 10.2.3.5.A for details.

At each disposal site, the topsoil would be removed, stockpiled on the site, and serve as a root bed for revegetation. Grading of the excavated material pile and revegetation will prevent erosion. Standard construction methods preventing erosion to streams would be implemented. The details of design would be developed during the final design of the SSC. The topsoil is stored temporarily and could be covered if necessary to preclude erosion of topsoil.

1513.145

The spoil disposal sites are presented in EIS Volume IV, Appendix 10 Section 10.2.3.5.A.1. The excavated material disposal sites were presented in Figure 10.2.3.7 of the DEIS. Please refer to Figure 10.2.3.7, Section 10.2.3.5A1 and Volume VI, Appendix 10 for the location of disposal sites.

1513.146

It is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with applicable environmental statutes, regulations and standards.

The State of North Carolina proposes disposal of the excavated materials at 17 different locations or to sell or donate excavated material to local producers of aggregate, or sell some excavated material and dispose of some material. The disposal sites are shown in EIS Volume IV, Appendix 10, Figure 10.2.3.7.

At each disposal site, depending upon site conditions, berms or dikes may be used to prevent surface erosion and runoff from the sites. Mitigative measures are discussed in Volume IV, Appendix 7.

1513.147

The comment questions information in North Carolina's SSC site proposal. See Comment Response 1513.35 and 13.02. Before information provided in a state's proposal is used in the EIS, the procedure is to verify the information for accuracy by checking independent sources. Unsubstantiated statements are not included and conflicting information was resolved before use in the EIS.

1513.148

The statement on page 3-84 of the North Carolina proposal attempts to indicate that tunneling in the North Carolina rock material will be less expensive than other sites due to more favorable water inflow conditions.

An excavation/lining plan similar to that proposed by North Carolina was used for the cost estimate in EIS Volume IV, Appendix 2, Sections 2.2, 2.3 and 2.4.

Potential impacts to North Carolina site surface water and groundwater are discussed in EIS Volume IV, Appendix 7, Sections 7.1.3.5 and 7.2.3.5.

1513.149

Questions concerning State of North Carolina regulatory actions with regard to existing operation of the Butner waste water treatment plant are beyond the scope of this EIS. See also Comment Response 786.05.

1513.150

Regardless of the precise value, the correlation is poor--given the complexity of the natural system, good correlation should be 0.70 or better. The example provided in the comment makes this point quite well; the correlation of 0.38217 (the table suggests it should be 0.39357) between ground elevation and water table level is significant only if the level of confidence (the odds of being correct) is lower than one chance in 20. That is a poor correlation. In preparing the EIS, it was not assumed that the depth to the water table is a function of the land-surface elevation. Geohydrologic conditions at the site are described in EIS Volume IV, Appendix 5, Section 5.5.2.2.

1513.151

See Comment Response 1390.07.

1513.152

See Comment Responses 749.05 and 1513.142.

1513.153

Radon is a naturally occurring, chemically inert radioactive gas. It is a decay product of uranium or thorium, which are common naturally occurring elements found in low levels in rocks and soils. Radon is produced from the radioactive decay of the element radium, which is a decay product of either uranium or thorium. Radon-222 has a relatively short half-life of 3.8 days. Radon-220, a progeny of thorium decay series, has an even shorter half-life, 55 seconds. Radon-222 decays in several steps to form radionuclides with very short half-lives: polonium-218 (3.1 min), lead-214 (27 min), bismuth-214 (20 min), and polonium-214 (0.2 sec). These particles are commonly referred to as radon decay products. The radon released rate from rocks/soils is determined by the radium content, the physical/mechanical characteristics of the earth materials, and fracturing or faulting of the rock. The rocks most commonly enriched in uranium are certain types of granitic rocks, black (carbonaceous) shales, and phosphatic rocks. Two specific regions of geological formation in the U.S. are known with elevated radium content: the Piedmont and Coastal Plain provinces in Georgia, South Carolina, North Carolina, and New Jersey; and a northcentral area, consisting of parts of Wisconsin, Missouri, Illinois, Minnesota, and Iowa.

In Volume IV, Appendix 5, Section 5.5.6.1.B, the radioactivities of the soil/rock at the proposed North Carolina site are reported. The soil samples collected near the proposed SSC ring were analyzed for U-238,

Th-232, and K-40 concentrations. The concentrations, as reported in pCi/g, were less than 0.03 and 0.38 for U-238, 0.81 and 0.59 for Th-232, and 4.7 and 7.2 for K-40. Eight core samples from six locations around the proposed SSC site ranging in depth from 8.8 ft to 238.6 ft were analyzed using gamma spectroscopy for radium/radium daughters. Two of these samples were at shallow depths -- 8.8 ft and 13.4 ft -- and yielded results of 1.08 pCi/g and 0.55 pCi/g, respectively. The other six cores were from 1116.9 ft to 238.6 ft and ranged from 0.05 pCi/g to 0.75 pCi/g with an average of 0.33 pCi/g. Twenty-one samples from locations around the ring near the proposed tunnel depth (38 to 251 ft) were analyzed. The U-238 and Th-232 in rocks/soils, which are calculated from the reported data, range from 0.4 to 5.2 ppm (average 1.5 ppm) and 0.6 to 11.4 ppm (average 3.8 ppm), respectively. Radium activities in the various geologic classifications are also summarized in Volume IV, Appendix 5, Table 5.5.6-2. The radon concentrations in tunnel and interaction regions are projected with the available data and conservative assumptions in Volume IV, Appendix 10, Section 10.1.3.1.B.2 and summarized in Table 10.1.3-12 and 13. The estimated working levels in the tunnel with 0.46 air exchanges per hour for the North Carolina site was 0.009 working level (WL). This is well below 0.3 WL which is the Federal occupational limit based on continuous exposure (170 hours per month) (see Volume IV, Appendix 12, Section 12.3.1.2). Because anomalies in radium content of the rock may occur, monitoring for compliance with occupational standards will be conducted during the construction phase as well as the operational phase.

During construction, the DOE has committed to be in compliance with the mining safety standards to protect the underground workers. The standards have been set for radon as well as other health and safety issues.

At the North Carolina site, about 2.7 million yd^3 of rocks and earth material would be excavated during the construction of shafts and tunnels. The composition of the excavated rocks and earth material would be 36 percent felsic to intermediate metavolcanics, 11 percent pelitic metaseds, 5 percent matic metavolcanics, 27 percent felsic intrusions, 13 percent metagranite, 3 percent hornblende, and 5 percent other (see Volume IV, Appendix 10, Section 10.2.3.4). North Carolina has proposed either to dispose of the excavated rocks and earth material at 17 different locations or to sell (or donate) excavated material to local producers of aggregate. Most of these aggregates have background levels of naturally occurring radium and other radionuclides. Because of the short half-life of radon (3.82 days), they will decay out in a short period. No adverse health and safety impacts from the naturally occurring radionuclides is expected when the excavation materials are used as aggregates.

1513.154

The North Carolina groundwater data was presented in EIS Volume IV, Appendix 5 and summarized in Volume I, Chapter 4.

If the proposed North Carolina site is selected for the SSC, a monitoring program would be established for determining existing conditions as a baseline for comparison of future measurements. To the extent more detailed information were available on existing conditions, this would be addressed in the Supplemental EIS.

1513.155

Radon is a decay product of naturally occurring radium in soils and rocks. Natural radioactivity in North Carolina is addressed in Volume IV, Appendix 5, Section 5.5.6.1. Indoor radon activity, radioactivity in soil/rock, and radioactivity in groundwater wells and in public water supplies are discussed in detail.

The health impacts from radiation during SSC construction and operations has been assessed in Volume IV, Appendices 10 and 12. There would be no measurable adverse impact from cumulative effects of exposure to radium or radon in drinking water and exposure to radiation from SSC operations. The dose equivalent from SSC operations would be primarily through the air pathway and is less than 0.001 percent of that from background radiation in North Carolina.

The dose equivalent from SSC operations would be primarily through the air pathway and is less than 0.001 percent of that from background radiation in North Carolina.

1513.156

See Comment Response 1513.154.

1513.157

In the day-to-day operations, tritium can be produced where the proton beam interacts with matter. Tritium produced as an air activation product was addressed in EIS Volume IV, Appendix 10, Sections 10.1.2.3.A.2 and 10.1.3.1.B, and Appendix 12, Sections 12.1.3.1.B and 12.3.1.1.B. Tritium produced in components, including the beam absorber closed loop cooling system, was addressed in Volume IV, Appendix 10, Section 10.1.3.1.D. A slight amount of tritium may be formed in the soil/rock surrounding the tunnel from routine beam gas losses. This amount was calculated for the projected operating lifetime of the SSC and the levels occurring under normal conditions are much less than those estimated from a beam loss. Even after a beam loss, the levels of tritium and sodium-22 would not pose a health hazard to users of groundwater (EIS Volume IV, Appendix 12; and Volume 1, Chapter 5).

Tritium will occur in the water of the cooling systems for the beam absorbers. This water will be contained in a closed loop cooling system and will not be able to leak into the ground (EIS Volume IV. Appendix 12, Section 12.4.1.2). Periodically, the water will be removed and treated in a solidification process. An evaporation treatment process is not planned. Solidified wastes will be disposed in a low-level radiological waste facility.

Generation of radioactive contaminated groundwater and associated health impacts are discussed in Volume IV, Appendix 12, Sections 12.1.3.1.C, 12.3.1, and 12.4.1. Results are presented in Tables titled Maximum Radioactivity in Well Water (50m Away), and Annual Dose Equivalent from Contaminated Groundwater, Volume IV. Appendix 12, Section 12.2.3.1.C. If the North Carolina site is selected the supplemental EIS will address in more detail disposal of any radioactive water produced.

1513.158

Any water in an active beam area, whether in a closed loop cooling system for the beam absorbers or water which has infiltrated the tunnel and collected in a sump, will be monitored prior to disposal or treatment. Any water found to contain radioactive material or constituents in excess of background will be treated as low-level radioactive waste in accordance with applicable regulations. The quantity of tritium produced in the infiltrate would be expected to be immeasurably small based on dewatering and dehumidification of the tunnel and the low beam gas losses tolerated by superconducting magnets.

1513.159

As suggested in the Site Environmental Report 87/58 1104.100 UC41, p. 61, water vapor removes tritium from components. This is because tritium is radioactive hydrogen (H-3) that is produced when two neutrons are absorbed into ordinary hydrogen. Tritium exchanges with the hydrogen in ordinary water. When water vapor is passed over components contaminated with tritium, an exchange takes place and the end product can be tritiated water. To prevent this, cooling water is kept to a minimum in those areas of the collider where the presence of a neutron beam could induce radiation by activation of the water. Additionally, if tritiated water is produced in an area of the SSC, precautions are taken to assure that it is isolated from nonradioactive water sources. For example, heat exchangers will use secondary sources of cooling water (nonradioactive cooling water) to cool components containing tritiated water, but these components are separated by double jackets or other barriers. EIS Volume IV, Appendix 10, Section 10.1.3.1.D discusses quantities of tritium that would result from operation of the closed loop system (see Comment Response 1322.82, which describes how the tritium will be treated and disposed). Additionally, the Conceptual Design Report of the Superconducting Super Collider (SSC-SR-2020) Section 6.8.2, describes in detail the cooling water requirements and identifies the locations where the presence of radiation necessitates engineering applications for health and safety purposes. Two primary examples are the primary cooling loops at location QQ, and the two abort dumps for the High Energy Booster (HEB) at QQ. To isolate radiation from the dumps, a secondary closed loop system is required. The primary loop is cooled by a local air heat exchanger.

1513.160

Since the SSC is at the conceptual design stage, the amount of piping in the cooling water loops has not been determined. That will be determined during final detailed design.

Although no specific details have been developed for decommissioning, some probable actions include: the piping that is part of the beam absorber cooling water loop will be removed and disposed of at a low-level radioactive waste site. Concerning the other loops, the piping that is below ground will remain in place. Piping above ground will be most likely be below release limits and will be monitored and released for scrap. If above release limits, it will be disposed in the same way as the beam absorber piping.

See Comment Response 1322.66 concerning the activation of cooling water and systems.

1513.161

The possible release of radiation as a result of proton or neutron activation of nonradioactive material is addressed in EIS Volume IV, Appendix 10, and summarized in Table 10.1.3-10 and Table 10.1.3-11. Its consequent health impact is assessed in Volume IV, Appendix 12, Section 12.3.1.1.B . The radionuclides assessed include tritium (H-3), Beryllium (Be-7), carbon (C-11), nitrogen (N-13), oxygen (O-15), chlorine (Cl-39), argon (Ar-41), radon (Rn-222), and its short-lived progeny. The interaction of a proton with matter gives rise to a nuclear electromagnetic cascade. Total absorption of the energy of a proton leads to about 20,000 to 30,000 nuclear interactions. Carbon-11 is produced in the inelastic collisions between a proton and nitrogen or oxygen. The concentration of C-11, presented in Volume IV, Appendix 10, Table 10.1.2-4, ranged from 0.025 $\mu Ci/m^3$ in the tunnel to 1.8 $\mu Ci/m^3$ in the beam cleanup areas. The major release points for C-11 are the ventilation shafts, which are located at ten service shafts labeled as F-sites on the layout and four interaction points and experimental areas labeled as K-sites. Meteorological data were used in the calculations leading to Table 10.1.2-4.

Doses to humans are estimated for total body and various organs through five exposure pathways. These exposure pathways include:

- Immersion in air containing radionuclides
- Direct exposure from radionuclides deposited on ground surface
- Immersion in water containing radionuclides
- Inhalation of radionuclides
- Ingestion of food produced in the area

All of the meteorological data were obtained from the weather station in the major metropolitan area nearest the proposed SSC sites. This meteorological data included annual average frequencies of wind direction in 16 compass directions, wind speed, atmospheric stability

category, annual rainfall rate, height of atmospheric mixing layer, and annual average concentration of each radionuclide at ground level as a function of direction and distance from the release point.

1513.162

The comment states, "Occasional loss of the beam will occur as a result of equipment failures. This will result in activation of tunnel components." This statement is not consistent with the EIS (see Volume IV, Appendix 12, Section 12.4.1). The EIS states that accidental beam loss will occur rarely, if ever. Considerable design effort has been and will be devoted to avoiding such an accidental loss, even with multiple and simultaneous failures of equipment, since such a loss would not only create radioactivity outside the tunnel, but would also damage the SSC magnets and other equipment.

A summary of all major radionuclides expected to be generated by SSC operations is given in Volume IV, Appendix 10, Section 10.1.3.1.D, and Table 10.1.3-14. This includes information on cobalt-60 as well as other radionuclides. Additional discussion of impacts can be found in Volume I, Chapter 5, Section 5.1.6.1.A, 5.1.6.2.A, 5.1.6.2.A.1 and 5.1.6.2.A.2.

The scenario that is postulated for full beam loss with artesian inflow carrying radioactivation products to the surface would involve a great deal of dilution. There would be more dilution and, consequently, less impact than the impact of the scenario postulated and quantitatively analyzed in Volume IV, Appendix 12, Section 12.4.1.1. The impact of this scenario shows the levels of radioactivity to be well below the EPA standards for drinking water even if an individual uses this hypothetical well as the only source of drinking water for an entire year. Therefore, the addition of shielding throughout the tunnel would not be necessary.

1513.163

The beam absorbers are designed for only one purpose -- to safely and conservatively absorb the energy of the beam when it is removed from the collider ring. The pelletized graphite core absorbs the vast majority of the beam energy. The day-to-day functional activities of the beam absorbers are very straightforward and are described in Volume IV, Appendix 1, Section 1.1.3.6.

The radioisotopes generated in each absorber will be contained primarily by the concrete vault that surrounds it. The radioisotopes generated are held or fixed in place since they are a part of the materials of the absorber. They will not be removed until the absorber is removed for replacement or at the time of SSC decommissioning. For a description of how these radioactivated materials will be handled at that time, see Volume IV, Appendix 3, Section 3.2.4.

An exception to the above is tritium that will be produced in the cooling water. At Fermilab this is drained periodically (and disposed of as low-level radioactive waste) in order to prevent the accumulation of a significant inventory of tritiated water.

1513.164

The DOE considered the radiation exposure that could occur to a person residing in the beam absorber areas. The overall radiation exposure to residents of the stratified fee areas is expected to be less than 0.001 mrem/yr, an immeasurably small amount. It is insignificant when one considers that the average individual receives about 360 mrem annually from background radiation (Volume IV, Appendix 12). For a more complete discussion of radiation exposure in the beam absorber area see Comment Response 789.03.

1513.165

The potential health risks from exposure to electromagnetic radiation from high-voltage power lines are not fully understood. (see Comment Response 733.02).

The available details of the power transmission grid and proposed new high-voltage lines for the North Carolina site are presented in Volume IV, Appendix 1, Section 1.2.5.10. Should the North Carolina site be selected for the SSC, further planning by the DOE, the State, and the utility company would be required to finalize the plans for power transmission.

1513.166

For planning purposes, the DOE assumed that all low-level radiological waste would be disposed at the Hanford facility in Richland, Washington, although disposal at a regional site is an option if such a site becomes available. See Comment Response 276.03. According to the information provided by the State of North Carolina, the State is entering a compact with seven other States in the southeast (see Volume IV, Appendix 10, Table 10.1.3-16). The siting of the southeast regional compact facility is subject to its own NEPA requirements and NRC licensing. Secondary impacts of SSC wastes are discussed in Volume I, Chapter 5, Section 5.2.

1513.167

The Freedom of Information Act request for waste management information has been noted.

1513.168

The DOE used 11 years of operations data, rather than just one year, in estimating the volume of low-level radiological wastes that have been generated at the Fermilab. The average volume of wastes over the time period of 1976 to 1986 was 7,650 ft^3 (EIS, Volume IV, Appendix 10, Table 10.1.3-15).

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The DOE is confident in its estimates of the amount of low-level wastes to be generated at the SSC. These projections took into account not only the experiences of Fermilab, but also the type of collider operation (i.e., no high-intensity, fixed-target program), the number of protons accelerated annually and the energy of those protons, and the 'clean' nature of the superconducting magnets (EIS, Volume IV, Appendix 10, Section 10.1.3.1). The estimates of the volume of wastes are conservative because they did not consider the benefits from a minimization program. As indicated in the EIS (Volume IV, Appendix 10, Section 10.1.3.1), the projected volumes from the SSC would be a small fraction (0.44 percent) of the low-level radiological wastes produced in the United States.

For planning purposes, it was assumed that low-level wastes would be disposed of at the DOE's Hanford facility in Richland, Washington, but other sites, such as a regional compact-operated and NRC-licensed facility, will be considered (Section 10.1.3.1).

1513.169

No matter where the SSC is sited, an on-site hazardous waste storage facility will be constructed for the temporary storage of the SSC-generated wastes. A permit will be applied for under the Resource Conservation and Recovery Act that incorporate all necessary safeguards against leakage to the environment from spills and other mishaps. When hazardous wastes are stored to await shipment offsite to an approved disposal facility, they are normally placed in secured, 55-gal drums or equivalent containers.

1513.170

The excavated material could either be disposed of at 17 different locations or could be sold or discounted to local producers of aggregate or some combination of these dispositions. Refer to EIS Volume IV, Appendix 10, Section 10.2.3.5 for details. EIS Volume IV, Appendix 10, Figure 10.2.3-7 shows the locations of the excavated material disposal sites.

At each disposal site, the topsoil would be removed, stockpiled on the site, and serve as a root bed for revegetation. Grading of the excavated material pile and revegetation will prevent erosion. Standard construction methods such as berms or dikes preventing erosion to streams would be implemented. Detailed mitigation plans to control sedimentation and erosion would be addressed in the Supplemental EIS for North Carolina if this is the selected site.

1513.171

The management of the proposal is the responsibility of the State of North Carolina. Questions about the management should be directed to the appropriate state agency. The DOE recognizes that prior to a decision to construct or operate the SSC a detailed review of impacts

and mitigation will be needed. A supplemental EIS will be proposed. Should North Carolina be the selected site, water quality control issues and mitigation measures will be assessed in greater detail (see Volume I, Chapter 3, Section 3.6).

1513.172

The final disposition of the occupied "sites" (facilities) is covered in the EIS in as much detail as possible. It is not possible at this time to predict exactly what part of the facility will be useful, e.g., for medical research or educational purposes, at the time of decommissioning.

Before the end of SSC operations, when the decision has been made to decommission, a detailed decommissioning plan will be prepared.

Any use of the land for purposes other than constructing and operating the SSC would require full compliance with the NEPA process, including preparation of additional NEPA documents to assess impacts. Disposal or use of the land after the useful life of the SSC by the Government would be analyzed as part of the decommissioning process.

Should the North Carolina site be selected for SSC construction, decommissioning of the SSC would be reviewed by the DOE to determine if it qualifies as a major Federal action significantly affecting the quality of the human environment. If it does qualify, preparation of an Environmental Impact Statement (including public comment period) would be required. This would address among other things, the need (if any) and detailed plans for monitoring.

1513.173

Geologic structures are discussed in EIS Volume IV, Appendix 5, Section 5.5.1.3. Information on the mapped faults in the site vicinity is featured in Appendix 5, Table 5.5.1-2. The shear zones noted in the comment are recognized in this appendix and also described in the State's proposal. The proposers positioned experimental hall K2 to avoid the shear zones. Additionally, field testing will be done prior to start of the construction stage which will validate the rock integrity at the K2 location. Available data on the shear zones indicate they can be tunneled-through with conventional techniques for rock support and water control.

The abandoned Cross-Cut Mine shaft is located about 300 ft north of the ring footprint and about 1800 ft from the centerline of the collider tunnel. The mine shaft, reported to be 70 or 80 ft deep, has its bottom at an elevation that is at least 50 ft above the elevation of the collider tunnel and would not be expected to impact construction of the tunnel.

The mineral resource potential of this and other mines and prospects is discussed in Volume IV, Appendix 5, Section 5.5.1.6; impacts of the SSC project on these resources are discussed in Volume IV, Appendix 7.

Water quality information presented in Volume IV, Appendix 5, Section 5.5.2.2 and Table 5.5.2-6 shows no correlation of rock type to water quality. Records from groundwater usage in the three counties concerned show wide usage for human consumption, irrigation, and commercial applications with no record of poor quality or acidic zones. pH values are given in Table 3-13 of the State's SSC proposal; no anomalous values were encountered in this data. Notwithstanding this, should acidic waters be intercepted by the tunneling, suitable resistant concrete and cement products can be designed to negate the impact.

Water inflow at the mines to the north was not a problem (Laney, 1917). At these locations quartz veins and shearing (a site for potentially greater local groundwater yield), did not produce engineering difficulties at that time. Underground mining techniques have advanced considerably since then. Additionally, based on the EIS geohydrology data (Volume IV, Appendix 5, Section 5.5.2.2), anticipated yields are well within construction tolerances.

1513.174

See Comment Response 1513.53

1513.175

A discussion of the inflow of groundwater into the tunnel and mitigation measures to minimize the volume can be found in EIS Volume IV,

Appendix 7, Section 7.2.3.5, and in Comment Response 1513.53. All of the expected conditions, including water conduits and artesian pressures, are within the range of water conditions that can be handled with normal underground construction techniques.

With regard to the inflow of acidic water mentioned in the comment, data in Table 3-13 of the North Carolina SSC site proposal indicate that there is no acid groundwater in the area. The pH values of the groundwater range from 6.2 to 7.2 which would be classified as slightly acidic to very slightly basic. See also Comment Responses 1513.49 and 1513.179.

1513.176

See Comment Responses 1513.50 and 1513.53.

1513.177

See Comment Response 738.01.

1513.178

See Comment Response 1513.47

1513.179

The comment suggests that the groundwater at the North Carolina site has a low pH resulting in a very acidic environment. The North Carolina SSC site proposal provides water quality data for ten selected wells in the area (Table 3-13). The pH values reported range from 6.2 to 7.2 which would be classified as slightly acidic to very slightly basic. (A pH of 7.0 is neutral, values less than 7 are acidic and greater than 7 are basic.) This is normal and typical for that environment. SSC components would not be adversely impacted under these conditions.

1513.180

The approximate locations for the disposal sites are shown in EIS Volume IV, Appendix 10, Figure 10.2.3-7 and the descriptions of the disposal sites are shown in Table 10.2.3-7. Final details of the disposal sites will be decided during final design and in the Supplemental EIS for the selected site.

1513.181

See Comment Response 1513.35.

The comment questions information in North Carolina's SSC site proposal. Before information provided in a State's proposal is used in the EIS, the procedure is to verify the information for accuracy by checking independent sources. In general, unsubstantiated statements are not included and conflicting information is resolved before use.

Table 3-9 of the North Carolina SSC site proposal shows the depth to the local water table. The information was derived from both borings (identified with the prefix SC) and from wells. Table 3-10 provides data on average water yield from wells. The borings listed in Table 3-9 were not completed as wells and cannot be tested for yield, the borings are not listed in Table 3-10.

In the EIS, a summary of the groundwater regime at the North Carolina site can be found in Volume IV, Appendix 5, Section 5.5.2.2. The depth to the water table, depth of wells, and well yield are discussed in this section. In addition, a discussion of the potential impact mitigation of the SSC on the groundwater regime can be found in Volume IV, Appendix 7, Section 7.2.3.5. Additional information on earth resources can be found in Volume IV, Appendix 5, Section 5.5.1. In particular, the stratigraphy of the North Carolina site is discussed in Section 5.5.1.2; the geology structure of the site is discussed in Section 5.5.1.; the geoengineering conditions are discussed in Section 5.5.1.4, and the geologic hazards are discussed in Section 5.5.1.5.

1513.182

The potential infiltration (if not controlled) into the tunnel and the plans for infiltration control and dewatering for the proposed North Carolina site are described in EIS Volume IV, Appendix 7, Section 7.2.3.5.A.1 and in Appendix 10, Section 10.2.3.5. Uncontrolled infiltration rates ranging from five to several tens of gal/min/100-ft of tunnel were estimated by the DOE, based on data provided in the State of North Carolina proposal. Since the infiltration into the tunnel can be controlled by various techniques, such as grouting, freezing, and slurry wall control, the actual infiltration is expected to be small and would not affect the regional groundwater supply. Consequently, the additional detailed studies suggested by the comment are not needed for site comparison and selection. Such studies would be considered if the North Carolina site is selected. Results of any additional analyses would be reported in the Supplemental EIS for the selected site.

1513.183

Comments noted.

1513.184

See Comment Response 1126.05.

1513.185

See Comment Responses 13.02 and 710.01.

1513.186

Comments noted. The cited report is not a DOE document and is not the responsibility of the DOE. See Comment Response 19.01.

The proposed North Carolina site was evaluated as a reasonable site alternative for the construction and operations of the SSC. The evaluation process which led to North Carolina being included on the list of best qualified sites (reasonable siting alternatives) is described in EIS Volume III, Chapter 2. Details of the current environmental and socioeconomic conditions are described in Volume IV, Appendix 5, Sections 5.5.2 (water resources) and 5.5.11 (socioeconomics and infrastructure). Water resources impacts are assessed in Volume IV, Appendix 7, Sections 7.1.3.5 (surface water) and 7.2.3.5 (groundwater), and socioeconomic and infrastructure impacts in Volume IV, Appendix 14, Sections 14.1.3.5 and 14.1.3.8.E (resources), 14.2.1.E, and 14.2.1.H.5 (transportation), and 14.2.2.E and 14.2.2.H.5 (utilities).

1513.187

Issues related to North Carolina site waste disposition are discussed in EIS Volume IV, Appendix 10, Sections 10.2.3.5 and 10.3.3.

Questions associated with spoils disposition at the North Carolina site are addressed in EIS Volume IV, Appendix 10, Section 10.2.

The decommissioning plan is discussed in EIS Volume IV, Appendix 3. Any use of the land for purposes other than constructing and operating the SSC including decommissioning would require full compliance with the NEPA process, including preparation of additional NEPA documents to assess impacts. Disposal or use of the land after the useful life of the SSC by the government would be analyzed as part of the decommissioning process.

Should the North Carolina site be selected for SSC construction, decommissioning of the SSC would be reviewed by the DOE to determine if it qualifies as a major Federal action significantly affecting the quality of the human environment. If it does qualify, preparation of an EIS (including public comment period) would be required.

1513.188

Data used in the DEIS were provided by the proposer states, including North Carolina. As noted in the DEIS Volume I, the Final EIS will contain revisions and additions to the DEIS, including updated detailed information provided by the States. This Final EIS will identify the DOE's selected site. The DOE's final decision, and the rationale for its choice, will be documented in the Record of Decision.

The DOE further recognized that a more detailed site-specific review will be required under NEPA prior to a final decision on the construction and operations of the proposed SSC. This more detailed review will be provided in the supplement to the Final EIS.

1513.189

See Comment Responses 13.02 and 710.01.

1513.190

See Comment Response 1513.14.

1513.191

Water requirements for the SSC project and additional off-site domestic use can be met by existing reservoirs in the project vicinity which have adequate excess capabilities. Lake Michie would not be used for direct water to the proposed North Carolina SSC project, although some increase in demand could be placed upon the lake due to in-migration induced by the project. The safe reservoir yields used in the evaluation were estimated for 20-yr drought conditions, i.e. a drought with an average recurrence internal of 20 years. The safe yield for a more severe drought would be less, but such yield data are not currently available (see EIS Volume I, Chapter 5, Section 5.1.2.4 and Volume IV, Appendix 7, Section 7.1.3.5.G, for clarifying changes.

See also revised Volume I, Chapter 1, Table 1-1; Volume I, Chapter 3, Tables 3-3 and 3-7, and Sections 3.7.3 and 5.2.3; and Volume IV, Appendix 5, Section 5.5.2.1.C.

1513.192

The wastewater referred to in the DOE letter comes from SSC activities, such as the cooling towers, which are different and independent of the closed-loop cooling systems for the beam absorbers. There will be no radioactivity associated with the water or wastewaters of the cooling towers, because these systems will not be linked with the collider operations where radioactivity can be produced. See Comment Response 1513.138 for more details.

In the core of the beam absorbers is a water cooled cylinder of aluminum surrounding the graphite. The beam absorbers are cooled with a closed loop water system consisting of coils wrapped around the aluminum cylinder. The water becomes radioactive because of interactions of the cascade with the water in the coils. The only long-lived isotope is tritium, which has a half-life of 12.3 years. The whole assembly is encased in a reinforced concrete vault in order to prevent groundwater from entering the active core of the absorber. The 400 gal (1,600 l) of cooling water contained in this closed-loop system contains a maximum of 0.14 Ci of tritium (EIS Volume IV Appendix 10, Section D). It is intended that the water in the absorbers would be replaced periodically to keep tritium concentrations low. The beam absorbers incorporate a liner that is monitored and would detect and contain any leakage that might occur. It is unlikely that the tritiated water would be released to the environment because of the closed loop system.

A treatment method which is currently used in treating low-level tritiated water involves solidification in a matrix, such as concrete. After the tritiated wastes are treated at the SSC, they will be disposed as low-level radioactive waste (see Comment Response 229.06).

Regarding the concern that tritium could be released to the environment during a concrete solidification process, the water used is bound up in the crystalline structure of the cement. Tritium as a gas is not available for release. During the solidification process as the concrete sets, water becomes chemically bound to the solids and is not available for evaporation. DOE Order 5820.2A limits the amount of free-standing liquid in a shipped waste to less than 0.5 percent of the waste. Thus, the treatment and disposal method is designed to fix the tritium and prevent its release to the environment.

1513.193

The DOE has no plans to store hazardous wastes or low-level radiological wastes permanently at the SSC, but like other laboratories and industrial operations, wastes will be temporarily stored until they are disposed of at an appropriate location. Any wastes at the SSC that are awaiting off-site disposal will be stored in accordance with Federal and

State laws, which are written to protect the environment and to prevent releases to surface and groundwaters. See Volume I, Chapter 6, for a discussion of these laws. See Comment Response 276.03 for a discussion of the disposal plans for radioactive wastes, Comment Response 524.06 for mixed wastes, and Comment Response 1184.04 for hazardous wastes.

1513.194

See Comment Response 1513.37.

1513.195

The capacity of Eno Wastewater Treatment Plant was expanded from 1.5 to 2.5 million gallons per day in 1987 and is planned for expansion to 10 million gal/d (Errata for EIS Volume IV, Appendix 5, Section 5.5.8.1). It is not certain that the expansion will be completed in time or whether the expanded capacity will be available to the SSC project. However, utilization of existing sewage treatment plants in Durham and other municipalities is only one of the alternatives considered in the EIS. If treatment capacity of existing plants is not adequate to support the SSC, package treatment plants could be installed. Further detailed discussion of available alternatives is presented in EIS Volume IV, Appendix 7, Section 7.1.3.5.F.

1513.196

The comment is questioning information in North Carolina's SSC site proposal. Before information provided in a state's proposal is used in the EIS, the procedure is to verify the information for accuracy by checking against independent sources.

North Carolina's SSC site proposal, Table 3-5, is continued on page 3-44 where the information on Rock Unit 7 is provided. The water table depth is reported to be 15 to 20 from the surface. Information used in the EIS on the depth to the water table at the North Carolina site is provided in EIS Volume IV, Appendix 5, Section 5.5.2.2.

1513.197

Table 8-10 on page 8-33 of the North Carolina Site Proposal Volume 8 does not contain water quality data for Lake Michie. Table 8-10 of the North Carolina Site Proposal, Volume 8 contains water quality data for Lake Butner. Data in this table are not used in the EIS. Water quality data used in Volume IV, Appendix 5, Section 5.5.2, Table 5.5.2-3 of the EIS were obtained from the EPA's STORET database.

1513.198

See Comment Response 991.02. The accelerator access points would be permanently sealed. The question concerning the handling and disposal of radioactive and hazardous parts is answered in EIS Volume IV, Appendix 3. DOE and its designated contractors will be responsible for decommissioning.

150115143358863

1513.199

Based on experience at accelerator facilities elsewhere, the expected extent of contamination of the collider tunnel wall is extremely low (slightly higher than background levels). This contamination consists of radionuclides with short half-lives (primarily sodium-22 with a half-life of 2.6 yrs), that will decay to lower levels within a few years. (See also EIS Volume IV, Appendix 10, Section 10.1.3.1.D.)

1513.200

The DOE does not plan to use the decommissioned SSC tunnel for disposal of any hazardous, radioactive, or other waste, nor has any testing program been suggested. In addition, the tunnel design is technically unsuitable for these purposes. Upon decommissioning the tunnels would be sealed to permanently deny unauthorized access. (See decommissioning, Volume IV, Appendix 2).

1514.01

See Comment Response 13.02 for description of data verification.

The DOE planned to expand public hearings into a second day at sites where there was sufficient preregistration to warrant a second day. Additional sessions were added at some sites in response to the need. In addition, open registration was allowed at each of the hearings. It should be pointed out that public hearings were not required and represent only one way to receive public input. Written comments received equal consideration. The DOE allowed the required 45 days for public review and comments.

1514.02

Comments noted.

1514.03

The DOE required that each proposer certify the authority under which their proposal was submitted (see EIS Volume IV, Appendix 4 and Volume III, Chapter I). The DOE believes that the North Carolina proposal was properly authorized.

1514.04

The local support and opposition to the project has been taken into consideration in the site selection process (Volume III. Chapter 3).

1514.05

Information concerning drought conditions has been considered in revised assessments in the EIS of surface water supply conditions at the North Carolina site.

150115143358864

The Little River Reservoir completed in early 1983 roughly doubles the safe yield of City of Durham's water supply and should bring some relief to the water shortage experienced in the past in the proposed site area. The new reservoir has been included in the revised water supply assessment in the EIS (Volume I, Chapter 5, Section 5.1.2.4 and Volume IV, Appendix 7, Section 7.1.3.5.G). The assessment indicates that water requirement for the SSC project and additional off-site domestic use can be met by existing reservoirs in the project vicinity, which have adequate excess capacities. The safe reservoir yields used in the evaluation were estimated for 20-year drought conditions, i.e., a drought with an average recurrence interval of 20 years. The safe yields for a more severe drought would be less, but such yield data are not currently available. The drought in the past few years may be more severe than a 20-year drought. Furthermore, a drought may last more than one year. More detailed study on water supply reliability incorporating information from the recent drought years will be conducted and documented in the Supplemental EIS if the North Carolina site is selected for SSC.

1514.06

See Comment Response 732.07.

1514.07

Comment noted.

1514.08

The EIS was based on publicly available data. The DOE has evaluated all data submitted by the State of North Carolina. Where errors have been identified in the DEIS, they have been corrected in the final EIS. See the Errata, Appendices 1 to 6, 8 to 10, 12 to 16, and revised Volume IV, Appendices 7, 8 and 11.

1514.09

The number of wells within the SSC footprint in North Carolina was not reported accurately in the DEIS (see Comment Response 1390.07 for further discussion and clarification). The State had provided well records which document 112 wells within 1 mi of the ring centerline and had also noted that wells have only been required to be registered since 1959 and since that time perhaps only half or fewer of the wells drilled have been actually registered. Given the potential for unregistered wells and commenters' input, it is assumed that in excess of 300 water wells may exist within the SSC footprint. However, only a small number of these may be directly affected by the project and required to be closed. The State estimates, based on field surveys, that only about 9 wells (the number reported in DEIS) would be directly affected and required to be closed because of the SSC.

1514.10

See Comment Responses 710.01 and 880.04.

1514.11

Mayo Reservoir rather than Lake Michie is proposed to supply water to the far cluster area of the SSC. The Little River Reservoir, completed in early 1988, roughly doubles the safe yield of Durham's water supply. These changes have been included in the revised water supply assessment in the EIS (Volume I, Chapter 5, Section 5.1.2.4 and Volume IV, Appendix 7, Section 7.1.3.5.G). The assessment indicates that water requirements for the SSC project and additional off-site domestic use can be met by existing reservoirs in the project vicinity, which have adequate excess capacities for the anticipated SSC operation period. The safe reservoir yields used in the evaluation were estimated for 20-year drought conditions, i.e., a drought with an average recurrence interval of 20 years. The safe yields for a more severe drought would be less, but such yield data are not currently available. The drought in the last few years may be more severe than a 20-year drought. Furthermore, a drought may last more than one year. More detailed study on water supply reliability incorporating information from the recent drought years will be conducted and documented in a Supplemental EIS if the North Carolina site is selected for the SSC.

The capacity of Eno Wastewater Treatment Plant was expanded from 1.5 to 2.5 million gal/d in 1987 and is planned for expansion to 10 million gal/d, although a schedule for this expansion is not presently established (Errata for EIS Volume IV, Appendix 5, Section 5.5.8.1). It is not certain that the expansion will be completed in time or whether the expanded capacity will be available to the SSC project. However, utilization of existing sewage treatment plants in Durham and other municipalities is only one of the alternatives considered in the EIS. If treatment capacity of existing plants is not adequate to support the SSC, package treatment plants could be installed. Further detailed discussion of available alternatives is presented in EIS Volume IV, Appendix 7, Section 7.1.3.5.F.

1514.12

The level of service (LOS) for the major roads in the SSC area are given in EIS Volume IV, Appendices 5 and 14. The reported LOS values were developed independently from the North Carolina proposal using information provided by the North Carolina Department of Transportation. These LOS values (I-85 east of Durham: LOS A; I-85 west of Durham: Not evaluated in the EIS; U.S. Route 501: LOS A-D) are not the same as those presented in the comment. However, the general conclusions that I-85 provides a good level of service and that U.S. Route 501 provides a moderate level of service are the same as those reached by the commenter.

1514.13

See Comment Response 13.02 and 1513.03.

1514.14

See Comment Response 1513.64.

1514.15

See Comment Response 1390.11.

1514.16

EIS Volume IV, Appendix 5, Section 5.5.10.1.F presents a discussion of the Durham County critical watershed ordinance (1985) and the Durham County Board of Commissioners' General Development Plan - 2000 (1987). Volume IV, Appendix 13, Section 13.1.1 states that it has been anticipated by the DOE that the SSC may trigger zoning changes in affected adjacent areas should there be incompatible land uses. Both types of zoning changes will be instituted by the affected planning agencies of their own accord. See Comment Response 384.02, first paragraph, for a discussion of the DOE policy towards establishing intergovernmental relationships.

1514.17

See Comment Responses 710.01, 880.04 and 1390.13.

1514.18

See Comment Responses 700.01 and 1390.09.

With respect to local public schools, current student/teacher ratios and SSC-related impacts to public services (including public education) are examined for the North Carolina Region of Influence (ROI) and for individual primary impact counties (Durham, Granville, and Person counties) within the ROI (see Volume IV, Appendix 5, Section 5.5.11.1.C and Volume IV, Appendix 14, Section 14.1.3.5.C, respectively). The examination of issues related to education incorporates the most recently published data from the North Carolina Board of Education (1987), which presents public school enrollments and personnel for the 1986-1987 school year. The EIS projects that Durham County school enrollments are likely to increase due to SSC development, and local public school districts would need to respond by adding instructional and support staff and, in some cases, by expanding facilities to maintain current service levels and to meet the increased demand. The current "serious problems" referred to in the comment are existing conditions which would be present with or without SSC siting in the region.

1514.19

See Comment Response 13.02.

1514.20

Comments noted.

1514.21

Comment noted.

1514.22

The total amount of privately-owned land that would be required by SSC development at the proposed North Carolina site is 14,437 acres, of which 6,817 acres would be included in the fee simple transfer and 7,620 acres in the stratified fee estate category (EIS Volume I, Chapter 3, Section 3.4).

In North Carolina's proposal, the market value of private real property that would be acquired by the State and transferred to Federal ownership was estimated at $22.8 million. Site and infrastructure improvements to be paid for by the State are estimated to cost $95 million (EIS Volume IV, Appendix 14, Section 14.1.3.5.D). The total of these expenditures is less than $120 million.

A total of 106 residences would be relocated by the SSC in North Carolina (EIS Volume I, Chapter 3, Section 3.4).

1515.01

Comments noted.

1515.02

These observations are consistent with those of the EIS (Volume III, Chapter 2). If the proposed Colorado site is selected, the DOE and its contractors will work closely with appropriate State and local agencies in minimizing any adverse impacts as a result of siting the SSC in Colorado. A more detailed review of impacts would be provided in the Supplemental EIS.

1515.03

The EIS characterizes the site factors as accurately as possible based on available information as noted in Comment Response 543.02.

Despite its distance from the proposed facility site, however, metropolitan Denver is anticipated to play an important role in SSC-related regional development -- with roughly 51 percent of the peak construction year (1992) impact population, and 49 percent of the full operation (beginning in 2000) population, expected to reside in the Denver area (Volume IV, Appendix 14, Section 14.1.3.2.B). See Comment Response 1068.14.

1515.04

See Comment Response 1515.13.

1515.05

The EIS explicitly considers the Denver metropolitan area with regard to potential impacts from the SSC. This consideration is founded upon the allocation of project-related population growth -- which in turn generates other impacts such as increasing housing demand, increasing demands on public services, changes in public finance, and economic impacts. As discussed in greater detail in the first paragraph of Comment Response 1068.14, the Denver metropolitan area is expected to receive 51 percent of peak year (1992) population growth, and 49 percent of the population growth projected to occur during the first year of full operation (2000).

1515.06

See Comment Response 1515.11.

1515.07

Comment noted.

1515.08

Roads and infrastructure are discussed in EIS Volume I, Chapter 5, Section 5.1.8.6 and in Volume IV, Appendix 14, Sections 14.2.1.3.B.1 and 14.2.2.3.B. The EIS analyzed impacts over a broad geographic area because the roads and infrastructure proposed by Colorado covered a broad geographic area. For example, the proposed east-west access highway would extend approximately 60 mi west from the campus to I-76 near Brighton. Proposals made by the other states did not include roads and infrastructure improvements over such a broad geographic area. Those proposals made use of existing roads and infrastructure located closer to the proposed SSC sites. The proposals made by the other states except Arizona provided for reasonable access to the proposed sites. Mitigations were provided in the EIS to improve site access.

1515.09

The analysis of transportation and utilities presented in Volume IV, Appendix 14, Section 14.2 shows the impact of the SSC on the existing and proposed infrastructure. These analyses were prepared for the construction and early operations period (year 2000) for each site. Direct SSC impacts are expected to continue at a constant rate after the year 2000. The analyses of non-SSC transportation and utilities impacts due to normal population growth were not carried out over the entire life of the project due to the uncertainty of forecasting non-SSC traffic and utility growth many years into the future. The analyses that were performed are adequate for the purpose of this EIS.

1515.10

The DOE agrees that the EIS must provide a fair and equitable evaluation of all alternatives considered in the document. The DOE believes the EIS provides a comparative analysis among the seven sites which is sufficient to assess the impacts of siting the SSC. See also Comment Responses 1515.09 and 1515.11.

1515.11

The text of Volume I has been revised to reflect the comments received on the Draft EIS. The summary tables have been prepared based on the text and every effort has been made in the EIS to make sure that the tables are consistent with the text and present an accurate comparison of impacts among sites.

See Comment Response 13.02.

1515.12

See Response Comment 577.02.

15151516335882

1515.13

The growth anticipated to accompany the SSC will be of a magnitude and duration not recently experienced in the Colorado Region of Influence, or the primary impact counties of Adams, Morgan, and Washington. This includes the growth which accompanied the construction of the Pawnee Power Plant (see the first paragraph of Comment Response 1515.213).

SSC-related population impacts in Morgan County are anticipated to total roughly 16 percent of the baseline in 1992, and 14 percent in the year 2000; maximum single-year population growth, between 1990 and 1991, would itself represent nearly 7 percent of the baseline, and would reverse an anticipated decline in Morgan County population without the project (see Volume IV, Appendix 14, Section 14.1.3.2.B). Such increases are substantial, particularly in a county whose population has recently been quite stable.

Data provided in a recently compiled study of Morgan County housing are discussed in the first paragraph of Comment Response 1337.01; available units would not adequately accommodate projected population impacts in the county during SSC construction. The construction of housing units on available residential lots would help to meet anticipated increases in housing demand.

The commitment of the Colorado State government and local jurisdictions to the success of the SSC is acknowledged.

1515.14

See Comment Responses 577.04 and 1515.133.

1515.15

See Comment Responses 577.3 and 1515.24.

1515.16

See Comment Response 1278.11.

1515.17

The comment is considered a clarification of the State's proposal. Recognition of the Colorado land acquisition strategy is reflected in Volume I, Chapter 3, Table 3-5, footnote "e" and Volume IV, Appendix 4, Section 4.4.2.1.

1515.18

See Comment Response 1515.101.

1515.19

Comments noted. In this EIS, the DOE has attempted to state the project impacts on land use without characterizing these changes in either a negative or positive light in order to permit fair comparison among the seven proposed sites. This document is not meant to express the opinion of the DOE on the value of siting the SSC in Colorado.

See Comment Response 1515.190 for a discussion on prime and important farmlands potentially impacted by SSC project development. The loss of such lands is under the purview of the Farmland Protection Policy Act which requires Federal agencies to minimize or eliminate the unnecessary and irreversible conversion of farmland to nonagricultural uses and to assure that Federal programs, to the extent practicable, are compatible with State, local government, and private programs designed to protect farmland (see Volume I, Chapter 6, Section 6.2.19). In the context of the Farmland Protection Policy Act, this is implied to be a negative or adverse effect. See Comment Response 1515.21 for a discussion of land use planning.

1515.20

Travel time and distance were both considered in the EIS for the examination of all seven proposed SSC sites, including the Colorado site. For the analysis of socioeconomic impacts, travel time was employed as the more accurate indication of proximity of the proposed site to other locations (of possible residence for in-migrants) in the Colorado Region of Influence (see EIS Volume IV, Appendix 14, Section 14.1.2.3). Moreover, as noted in Comment Response 4.06, the average travel time employed to allocate workers was 1.5 times that reported for Denver-Boulder SMSA workers -- thus expanding the distance travelled in this largely rural area, as opposed to taking "an urban orientation about travel distance and time."

1515.21

Volume IV, Appendix 5, Section 5.2.10.1.D presents data on the status of State, regional, and local land use planning in eastern Colorado, including Morgan and Adams Counties. Volume IV, Appendix 13, Section 13.1.4.B acknowledges the considerable local professional planning experience in managing rapid growth generated by large-scale projects such as the SSC. See Comment Response 384.02 for a discussion of DOE policy on the need for and value of establishing intergovernmental relationships.

1515.22

Comments noted. For a discussion of the DOE intentions for a Supplemental EIS see EIS Volume I, Cover Sheet and Introduction.

1515.23

Comments noted.

15151516335884

1515.24

Loss of habitat refers to either the permanent removal of habitat by destruction or the short-term loss of habitat through disturbance or disruption due to the proximity of human presence or activities. As stated in the EIS Volume I, Chapter 5, Section 5.1.5.2.B, it is unlikely that construction of the proposed highway access route (construction upgrades to State Highway 7) would cause significant adverse impacts to the nesting pair of bald eagles at Barr Lake State Park. However, Volume IV, Appendix 11, Section 11.3.2.1.B, states that eagles wintering at Barr Lake and at the Rocky Mountain Arsenal, as well as the nesting pair at Barr Lake, could be exposed to disturbance by construction of the highway (the proposed route is approximately 2 miles from the eagle nest site). This evaluation is based on information that the final location and alignment of the access highway has not been decided upon. It is also based on an understanding of the sensitivity of this species to disturbance, particularly during the breeding season. Therefore, the DOE cannot state with certainty that there would be no adverse effects or loss of habitat to bald eagles present in the region at various times of the year. Specific measures to mitigate impacts on bald eagle habitats will be discussed in the Supplemental EIS, if Colorado is the selected site.

1515.25

See Comment Responses 562.02, 1515.43, and 1515.74.

1515.26

Volume I, Chapter 3, Table 3-4 and Volume IV, Appendix 4, Table 4-3 have been corrected to reflect the suggested change.

1515.27

Comment noted. The footnote has been deleted from Volume I, Chapter 3, Table 3-4 and Volume IV, Appendix 4, Table 4.

1515.28

EIS Volume I, Chapter 3, Table 3-5 and Volume IV, Appendix 4, Section 4.4.2 and Table 4.2 have been revised to reflect the suggested change. See Volume IV, Appendix 4, Section 4.4.2.1 for a discussion of Colorado's strategy on land acquisitions. See also Comment Response 275.04.

1515.29

During a wetlands survey of the proposed Colorado site, it was observed that a portion of Vega Creek in the vicinity of the K6 interaction area has been impounded. The extent of standing water observed (late September) in the impounded segment indicates that this may be a perennial water body. The text in Volume I, Chapter 3, Section 3.4.2 has been modified to reflect that this is the only perennial aquatic system known to be in the immediate area of the proposed ring.

15151516335885

1515.30

The EIS Volume I, Chapter 3, Section 3.4.2 is changed to indicate that the water for the SSC Project would be supplied by the Morgan County Quality Water District, not Morgan County.

1515.31

Clarification noted; however, this does not affect any analysis or conclusions of the EIS. Therefore, correction to the figure is not considered necessary.

1515.32

As stated in Volume IV, Appendix 5, Section 5.7.2.2.A, the principal regional aquifers in the project area consist of the Twin Mountains Formation of the Trinity Group and the Woodbine Formation. Wells completed in the Twin Mountains Formation have depths to water ranging from about 440 to 880 ft below land surface. Wells penetrating the Woodbine Formation have water levels ranging from 163 to 415 ft below land surface. Alluvial deposits along the major streams, as well as outcrops of the upper weathered zone of the Austin Chalk, serve as limited sources of shallow groundwater supplies. The collider tunnel is aligned so that it lies above the deep water table of the regional aquifer and is generally below the thin veneer of shallow, saturated sediments and local perched aquifers. The statement in Volume I, Chapter 3, Section 3.4.7 has been revised in Comment Response 1504.08 to reflect the significance of the shallow groundwater sources.

1515.33

See Comment Response 578.04.

1515.34

The discussions in the EIS on the impacts related to administrative (land acquisition) or safety-related (nearness to tunnel or other SSC facilities) issues and loss of water wells was somewhat inconsistent among states and within the various sections of the EIS. Consequently, several sections of the EIS have been revised to provide a consistent and clear assessment of the potential for loss of water wells at each site.

To ensure safety, a 150-ft radius around the tunnel will be established within which no water wells, existing or new, will be allowed. A 1,000-ft-wide restricted zone along the tunnel (500 ft on each side) is anticipated. This zone is established for control, however, and wells within it would not be required to be closed. Replacement of wells within this zone may be limited due to the vibrations from drilling. This would likely be dictated by site-specific conditions or timing of the drilling and is not excluded. Existing wells on fee simple land for the project would likely have to be abandoned, but this is not assured in all cases.

15151516335886

State records of water wells are available, but in most cases it was indicated by the States that the records were not up to date. Limited field survey information was available, and therefore it was assumed that the well data were not detailed enough to develop an accurate count of the wells that fell within the specific total restrictions areas identified above. Given those limitation, the intent of the presentation is only to identify the approximate number of wells within the footprint of the SSC and provide a general comparison of the relative density of water wells near the individual state sites. The number of wells which might be hydrologically impacted by SSC activities (water level declines or possible water quality changes) also cannot be accurately estimated with the available well records and the lack of final siting and design information. Both of these issues (well closures due to land acquisition and proximity to facilities and wells hydrologically impacted) will be addressed in detail in the Supplemental EIS to be prepared for the selected site.

See revised EIS sections as follow: Volume I, Chapter 1, Table 1-1; Volume I, Chapter 3, Table 3-7; Volume I, Chapter 5, Section 5.4 and Table 5.6-3; and Volume IV, Appendix 7, Section 7.2.3.1.A.6 through 7.2.3.7.A.6. The figures showing the location of wells have been deleted from the EIS.

To reflect the apparent general lack of completeness in well records, the Colorado discussion now indicates less than 20 wells and also notes the State estimate of 12.

1515.35

The last two entries in Volume I, Chapter 3, Table 3-7 are included to compare impacts on air and noise between states. Much of the narrative of the same chapter has been deleted due to consideration of other comments and, therefore, is not included in Table 3-7.

1515.36

See Comment Response 1515.24.

1515.37

EIS Volume IV, Appendix 11 has been revised to include recent surveys investigating the presence of prairie dog towns in the vicinity of the proposed Colorado site conducted by the DOE, USFWS, and Colorado Division of Wildlife. Although it is extremely unlikely that black-footed ferrets are present in the region, in the event Colorado is the selected site, additional comprehensive and detailed surveys of the habitat would be conducted to confirm the presence or absence of the species and would be included in the Supplemental EIS.

Volume I, Chapter 3, Table 3-7 indicates that potential habitat for the black-footed ferret (whether they are actually present or not) would be lost or disturbed. Volume I, Chapter 3, Table 3-7 has been revised to be consistent with information in Volume I, Chapters 4 and 5 and Volume IV, Appendix 11.

1515.38

See Comment Response 1515.76. All appropriate tables and text have been changed to reflect a reevaluated maximum wetland impact acreage of 3.7 acres (rounded to 4 acres in some instances). See Volume I, Chapter 1, Table 1-1 and Volume I, Chapter 5, Section 5.1.5.3.B. Also see Volume IV, Appendix 11, Section 11.2.2 for a discussion of the wetland assessment methodologies and assumptions.

1515.39

At present the bighorn sheep in the area of the Arizona site have a range available to them that is used below its carrying capacity. One of the major effects on the sheep is anticipated to be the impact of noises associated with SSC construction and operations. However, because the sheep have a large area in which to escape this noise, the adverse impacts are likely to be negligible, especially if blasting activities are avoided during the rutting and lambing seasons (see Volume IV, Appendix 11, Section 11.3.1.2).

Please refer to Comment Response 1515.211 for further discussion of the uniqueness of the bighorn sheep range near the Arizona site (Volume I, Chapter 4, Section 4.7.5.1).

1515.40

The page citations in the comment were checked, as were possible were mismatched citations; however the DOE was unable to determine the concerns raised. Nevertheless, the technical approach and methodology used in preparing the land use assessments is provided in Volume IV, Appendix 13, Section 13.1.2.

1515.41

The footnotes to Volume I, Chapter 3, Table 3-7 have been modified to more accurately reflect the level of study completed at each SSC site. See Comment Response 658.04.

The discussion in Volume I, Chapter 5, Section 5.1.9-2 is based upon the various levels of study that have been completed to date at each of the seven site alternatives as is discussed in Comment Response 658.04.

1515.42

The text of EIS Volume I, Chapter 3, Section 3.6.2 has been changed to indicate that wetlands and floodplains would either be avoided or the impacts mitigated to the extent practicable.

15151516335888

Volume I, Chapter 5 and Volume IV, Appendix 11, Section 11.3.2.1.B state that eagles wintering at Barr Lake and at the Rocky Mountain Arsenal, as well as the nesting pair at Barr Lake, could be exposed to disturbance by construction of the highway. This evaluation is based on information that the final location and alignment of the access highway has not been decided upon. It is also based on an understanding of the sensitivity of this species to disturbance, particularly during the breeding season. Therefore, the DOE cannot state with certainty that there would be no adverse effects to bald eagles present in the region at various times of the year.

See also Comment Response 1515.24.

1515.43

The referenced statements have been deleted from Volume I, Chapter 3, Section 3.6.2 of the EIS.

1515.44

See Comment Response 1515.37.

1515.45

There is no reference to the proposed Colorado water supply source for the SSC project on page 3-63 of Volume I, Chapter 3 of the DEIS. Regarding description of proposed water supply sources in the EIS, see Comment Response 1515.74.

1515.46

See Comment Response 1068.20.

1515.47

Alluvium fills drainages that are incised into, rather than cover, the plain. Loess, alluvial floodplains, and sand dunes are all noted in the description in Table 4-1 of Volume I, Chapter 4; their areal distribution is shown in Appendix 5, Section 5.2.1.

1515.48

As shown on Figures 5.2.1-1 and 5.2.1-3 of Volume IV, Appendix 5, eolian sand and alluvial deposits occur over more than half of the site footprint. Therefore the cited section of the EIS is accurate.

1515.49

The text in Section 4.1.4 of Volume I is changed as noted in the comment.

1515.50

See Comment Response 578.08.

1515.51

See Comment Response 577.06.

1515.52

See Comment Response 1068.24. Data source concerning FEMA floodplain map coverage (Letter from William P. Stanton of Flood Control and Floodplain Management Section, Colorado Water Conservation Board, Colorado State Department of Natural Resources to Philip Tang of RTK, concerning floodplain issues of the Colorado site, November 4, 1988) did not mention Badger Creek in Morgan County. The floodplain-map coverage of Badger Creek will be clarified if the Colorado site is selected.

1515.53

As indicated in the first paragraph, Section 4.2.1.2, Chapter 4, Volume I, the data in Table 4-2 represents "...surface waters in the major drainage basins of each of seven site alternatives." The data for Colorado from the South Platte River is included for completeness and because alluvium along the South Platte is a potential water supply source for the SSC project. Both Beaver Creek and Badger Creek flow into the South Platte River north of the proposed location.

1515.54

Volume IV, Appendix 5, Section 5.2.2 states that, "There are 14 NPDES permits issued by the Colorado Department of Health for surface discharge to waters in the project vicinity. Of the 14 permits, five regulate discharges directly to the South Platte River; the remaining permits regulate discharges to the tributaries of the South Platte." This assessment is based a Colorado Department of Health publication, 1987.

1515.55

The text of Volume I, Chapter 4, Section 4.2.2.2 has been revised to indicate that the gypsum occurs in weathered Pierre Shale. As described in Volume IV, Appendix 5, Table 5.2.1-1, and Volume IV, Appendix 6, Section 6.3.2.2, gypsum occurs as veins in the weathered portions of the bedrock. The gypsum results from oxidation of pyrite (occurring in the shale) forming jarosite and gypsum.

1515.56

EIS Volume I, Chapter 4 has been revised consistent with the comment.

1515.57

Volume I, Chapter 4, Section 4.7.1 has been revised as follows: "The site and surrounding areas are typical of the western Great Plains, occupied by populations of prairie wildlife such as pronghorn antelope, raptors, and migratory birds."

1515.58

The issue of oil and gas operations at the proposed Colorado site is discussed in more detail in Volume IV, Appendix 5, Section 5.2.7.1. Four oil-producing wells were identified within the SSC footprint. As observed by the site visit team during their travels over the proposed site, some of the oil wells in the area have old brine disposal pits as part of their operation. These pits are unlined and rely on earthen berms to retain the oil/brine liquids. Dr. Michael Richard of Colorado State University raised the issue of potentially hazardous materials associated with these brine pits (see the reference for Richard, 1987 at the end of Appendix 5a). His investigation of the site of the Last Chance disposal facility indicated that an old brine pit on the northern boundary of that site was known to contain hydrocarbon contaminants, some of which are hazardous waste constituents, that could leach into the surrounding environment. Therefore, it is suggested in the EIS that the present and former oil and gas well operations in or near the proposed SSC footprint could be a source of hydrocarbon contamination.

1515.59

See Comment Response 577.03.

1515.60

In EIS Volume I, Chapter 4, Section 4.7.4.1, the phrase "to upgrade I-76" has been revised to indicate the east-west access highway is planned for construction.

1515.61

Comment noted. See Comment Response 577.03.

1515.62

The availability of I-70 and I-76 is discussed in Volume IV, Appendix 5, Section 5.2.11.2. Route I-70 is also included in traffic analysis presented in Volume IV, Appendix 14, Section 14.2.1.3.B.1. Reference to I-70 has been added to EIS Volume I, Chapter 4, Table 4-29.

1515.63

The first paragraph of EIS Volume I, Chapter 4, Section 4.10.1.2.B has been modified to address the concerns of this comment.

151515163358811

1515.64

Discussion pertaining to paleontological resources in the vicinity of the North Carolina SSC site can be found in EIS Volume IV, Appendix 5, Section 5.5.12 and Volume IV, Appendix 15, Section 15.2.3.5. If the North Carolina site is selected, a more detailed discussion will be included in the Supplemental EIS.

1515.65

See Comment Response 578.04.

1515.66

See Comment Response 577.02.

1515.67

EIS Volume I, Chapter 4, Section 4.2.1.1 has been clarified as a result of this comment to note that the importance of FEMA mapping is in delineating not only areas of flood potential but also the presence of enough improved property at risk from flooding to be of concern. The more important indication of flood hazards is the actual encroachment of 100-yr floodplains. Floodplain encroachment analysis was conducted in compliance to Floodplain Management Executive Order 11988, which is presented in Volume IV, Appendix 7, and Volume I, Chapter 5.

1515.68

The text in EIS Volume I, Chapter 5, Section 5.1.2 referred to in the comment has corrected the statement that there are confined aquifers at the Colorado site that are or could provide groundwater supplies. The text now states there are no deep water supplies and the shallow unconfined alluvial aquifers are small and discontinuous.

1515.69

The suggested text additions noted in the comment have been added to the text of the EIS, Volume I, Chapter 5, Section 5.1.2.

1515.70

The amount of overall cost reduction attributed to the use of the existing facilities at Fermilab for the SSC project have been taken into account in the cost estimating process (see Volume IV, Appendix 2). Included in this estimate was allowance for any modifications to the existing facilities.

1515.71

See Comment Responses 1515.39 and 1515.211.

151515163358812

1515.72

A wetland survey of the proposed Colorado site has recently been conducted along with a reassessment of potential wetland impacts. Based on these, no riparian woodlands were found in areas where surface facilities for the proposed collider could be located. A text change to Volume I, Chapter 5, Section 5.1.5.1.B has been made to reflect this.

1515.73

See Comment Response 1515.24.

1515.74

It is the intent of the EIS to evaluate the primary proposed water supply source(s) and, at a minimum, to describe any alternative water supply sources. The text of the EIS has been revised at several places to reflect the fact that no new depletions of Colorado River or South Platte River water will occur in relation to any water supply source or acquisition process proposed by the State. See Comment Response 562.02.

1515.75

Corrections to the text of EIS Volume I, Chapter 5, Section 5.1.5 have been made regarding the piping plover and least tern.

1515.76

Potential wetland impacts at the site alternatives were reassessed based on an analysis of fee simple areas where surface facilities could be located (see Volume IV, Appendix 11, Section 11.2.2). Based on the assessment, a maximum of 4.7 acres of wetlands could be impacted by collider facilities in Colorado (Volume I, Chapter 5, Section 5.1.5.3.B. Colorado). See Comment Response 1515.38.

About 200 acres of wetlands occur along the proposed east-west access road. Because this acreage estimate does not consider mitigation, it appears that the acres of wetlands impacted by the road would be much lower than this total (e.g., could be within the 20-acre range mentioned in the comment). Potential mitigation is discussed in Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.5.3. If Colorado is the selected site, a more detailed assessment (including mitigation) of the wetlands associated with the access road would be provided in the supplement to the EIS.

1515.77

Regardless of which site is selected, any wetlands that would be impacted would have to be mitigated based on permit requirements under Section 404 of the Clean Water Act. This could include replacement, wetland enhancement, and/or other methods decided upon through consultation with appropriate agencies (e.g., COE and USFWS).

151515163358813

The paragraph on protection of wetlands was intended only to indicate that wetlands within fee simple areas where surface disturbances would not occur could be potentially protected from nonproject-related impacts such as residential development. To avoid this misunderstanding, this paragraph has been deleted from Volume I, Chapter 5, Section 5.1.5.3.

1515.78

The reference to 464 acres of permanently removed farmlands in the DEIS is incorrect. The Soil Conservation Service provided an estimate of zero prime farmland acres and 4,198 important farmland acres in the fee simple area of the proposed Colorado site. Of this inventory, it is estimated that 819 acres of important farmland would be permanently converted should the Colorado site be selected. These new figures are incorporated in Volume I of the FEIS and the errata for Volume IV, Appendices 5 and 13. The definition of prime and important farmland used by the Soil Conservation Service is discussed in Volume I, Chapter 4, Section 4.8.6.

The DOE recognizes that characterization of farmlands of statewide importance varies among states. However, for the purposes of this EIS the Department believes it is appropriate to combine the various categories of farmland for analysis. Should the Colorado site be selected, and if additional analysis by farmland category is needed, such information would be included in the Supplemental EIS.

1515.79

Morgan County contains relatively few year-round housing units (8,900 in 1980), and historically has had low-to-moderate vacancy rates. Between 1980 and 1987 construction permits were issued for fewer than 60 housing units annually (see Volume IV, Appendix 5, Section 5.2.11.B). In 1991, for instance, roughly 400 additional units would be required to meet SSC-related housing demand during that year alone (see Volume IV, Appendix 14, Section 14.1.3.2.B) -- nearly seven times the most recent aforementioned annual average, and not including housing demand in the county other than that generated by the SSC. The conclusion that a focused effort would be required to meet SSC-related housing demand does not seem unreasonable.

Public service demands would be roughly 16.5 percent beyond the projected baseline demand in 1992, and 13.9 percent beyond the projected 2000 baseline demand (see Volume IV, Appendix 14, Section 14.1.3.2.C). Increased demand for public services beyond 4 percent for a particular year is considered worthy of special attention. A focused effort would be required to mitigate such increased demands.

1515.80

As the title and footnote of the table referred to in the comment indicate, the annual fiscal impact projections for Adams County are the

estimated cumulative impact to all 42 local jurisdictions within the county, including seven municipalities, seven school districts, 27 special districts, and the county government itself. These impacts are projected to occur due to SSC-related growth in Adams County, not from the provision of services or infrastructure improvements to directly service the SSC campus or any other component of the SSC facilities. Details concerning the methodology of the public finance analysis are presented in the EIS in Volume IV, Appendix 14, Section 14.1.2.3.D and a more detailed discussion of the financial impact on Adams County local government jurisdictions is provided in Volume IV, Appendix 14, Section 14.1.3.2.D.

1515.81

As noted in the first paragraph of Comment Response 571.02, although boom conditions may occur in local communities due to the SSC, bust conditions are not anticipated. Impacts expected to accompany the SSC will be of a greater magnitude and longer duration than those recently experienced in the area. Some of these impacts, most notably those associated with housing demand and public services, are anticipated to exceed the amount which can be accommodated comfortably by local jurisdictions (see EIS Volume IV, Appendix 14, Section 14.1.3.2). Focused efforts on the part of the State of Colorado, and various jurisdictions and organizations within the state, should help to mitigate these impacts.

1515.82

See Comment Response 1068.27.

If the levels of service (LOS) for existing roads are low at any site, the addition of SSC traffic may further reduce the LOS. Thus, the LOS values could reflect the adequacy of the existing plus new roads to accommodate the SSC traffic. At those sites where the number of new and upgraded road miles is lower, the existing roads will have to accommodate the future SSC-induced traffic regardless of their existing LOS. The existing and projected traffic and LOS for roads at different sites are discussed in EIS Volume IV, Appendix 14.

The "increase in indirect traffic" (Volume I, Chapter 5) shows the "increase for county most affected by indirect SSC population growth," as explained in the footnotes for the two tables. In Arizona, Maricopa County will experience the most growth; however, the percent increase is only about 0.4 percent due to a large population base of the county. Morgan County will experience the most growth in Colorado. Due to a lower baseline population, the percent growth figure is higher. The increase in indirect traffic was assumed to be directly proportional to the projected increase in population. The impact of the SSC on the population growth is discussed in Volume IV, Appendix 14.1. A discussion of indirect traffic impacts is discussed in Volume IV, Appendix 14.2.

151515163358815

1515.83

See Comment Responses 1515.82.

1515.84

The statement cited in the comment has been deleted from Volume I, Chapter 5, Section 5.1.9.1.B for the reason stated. However, the statement remains in Volume IV, Appendix 15 because, within this section, it appropriately raises potential concerns based upon previous findings.

1515.85

The terminology used in the Advisory Council on Historic Preservation Regulations for Protection of Historic and Cultural Propoerties (36 CFR Part 800) is Programmatic Agreement (PA). Although the term PA is technically correct, the term MOU is commonly used referring to PAs and was used throughout the EIS for consistency.

1515.86

See Comment Response 1068.28.

1515.87

See Comment Response 577.02.

1515.88

Surface water use issues are addressed in EIS Volume IV, Appendix 5, Section 5.2.2.

The text of Volume I, Chapter 5, Section 5.2.12.2 has been revised to state the correct location for the Two Forks Dam.

1515.89

It does not presently appear to be possible to avoid the loss of some number of active oil and gas wells within the SSC footprint; these impacts may be mitigatable by slant-drilling new wells as the State of Colorado has committed to do.

1515.90

In EIS Volume IV, Appendix 7, Section 7.2.3.2 it states that Colorado has indicated that any water wells required to be abandoned or otherwise lost because of the SSC would be replaced, or an alternative water supply of equal or better quality would be provided to the affected well owner or user. It is also noted that this is a mitigation for the loss of the water supply; only a partial mitigation is assumed because of the potential inconvenience and temporary disruption in water supply for the affected water user.

1515.91

The impact to wetlands provided in the EIS is a conservative estimate of the maximum potential impact based on impacts without mitigation (see Volume IV, Appendix 11, Section 11.2.2). It should be noted that for Colorado site the maximum wetland impact has been reestimated to 4 acres for the SSC facilities (see Volume I, Chapter 5, Section 5.4 and Volume IV, Appendix 11, Section 11.3.2.3). Some 200 acres of wetlands are associated with the proposed east-west access road. However, final engineering designs were not available upon which to base an assessment of wetland impact. It is the DOE policy to avoid wetland impacts where practicable in accordance with Section 404 of the Clean Water Act and Executive Order 11990 Protection of Wetlands. Mitigation is discussed in Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.5, and Volume IV, Appendix 11, Section 11.3.2.3. The mitigative measures mentioned in the comment are included among the options presented in that section. If Colorado is selected as the site, a more detailed discussion of wetland mitigation will be provided in a Supplemental EIS.

1515.92

See Comment Response 1068.20.

1515.93

See Comment Response 577.02. Reference to Colorado has not been deleted.

1515.94

See Comment Response 577.02.

1515.95

See Comment Response 577.02.

1515.96

Text of EIS Volume IV, Appendix 5, Section 5.2.2.1 is corrected in the Errata.

1515.97

Table 5.2.2-3 in Volume IV, Appendix 5, Section 5.2.2.1 has been corrected in the Errata in response to comments.

1515.98

Table 5.2.8-2 in Volume IV, Appendix 5, Section 5.2.8.2 has been corrected.

1515.99

EIS Volume IV, Appendix 5, Figure 5.2.8-2 has been corrected in the Errata to Appendix 5.

1515.100

Text in Volume IV, Appendix 5, Section 5.2.10.1.1 has been corrected in the Errata in response to the comment.

1515.101

The information presented in the draft EIS has been revised in the Final EIS to reflect Soil Conservation Service (SCS) data. The SCS identified zero acres of prime farmland and 4,198 acres of important farmland in the SSC fee simple area at the Colorado site. These numbers were provided on the U.S. Department of Agriculture Farmland Conversion Impact Rating Form AD 1006 submitted to the DOE. Prime farmland is defined in 7 CFR 657.5 as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oil seed crops. Farmland of statewide importance is defined in 7 CFR 657.5 as land in addition to prime farmland that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. The Soil Conservation Service used these definitions to estimate the acreages submitted to the DOE for this EIS. The DOE agrees that with irrigation the high potential dry cropland (important farmland) would be considered as prime farmland, and recognizes that water (cost and distance) as well as economics play a major role in determining if or when irrigation would occur.

1515.102

Comment noted.

1515.103

Services for the elderly and handicapped are discussed in Volume IV, Appendix 5, Section 5.2.11.2.A.5.d.

1515.104

The statement cited in Volume IV, Appendix 5, Section 5.2.12 says that these two National Register sites are located near the project area; they are not located within the proposed collider ring. If the Colorado site is selected for the SSC, a more detailed survey will determine whether there will be any indirect impacts to the sites. If so, mitigation measures will be analyzed in the Supplemental EIS.

1515.105

This statement has been added in the Errata for Volume IV, Appendix 5, and Appendix 15. The DOE will comply with this policy.

1515.106

See Comment Response 577.02

1515.107

See Comment Response 1278.11.

1515.108

See Comment Response 564.07.

1515.109

Volume IV, Appendix 15 Section 15.1.3.2 has been corrected in the Errata as verified.

1515.110

EIS Volume IV, Appendix 15, Section 15.1.3.2 has been corrected in the Errata to reflect the suggested clarification. Field survey is needed to verify the precise location of site WN-10.

1515.111

Volume IV, Appendix 15, Section 15.1.3.2 has been revised to reflect the correction.

1515.112

Changes have been made in the Errata for EIS Volume IV, Appendix 15, to address the concerns of this comment.

1515.113

If the proposed Colorado site is selected for the SSC, the DOE and its contractors will work closely with State and local agencies, organizations, and individuals to minimize any adverse effects. A more detailed review will be provided in a Supplemental EIS.

1515.114

The DOE concurs with the recommendations and will construct and operate the SSC in a manner consistent with all applicable local, State, and Federal laws.

1515.115

Construction details based upon final design, including those needed for mitigation, will be determined after final site selection and analyzed in the Supplemental EIS.

1515.116

Volume IV, Appendix 8, Table 8-3 calls for tarpaulin covers on spoils haul trucks as part of the assessment methodology.

It is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with the letter and spirit of applicable environmental statutes, regulations, and standards.

1515.117

Volume IV, Appendix 10, Section 10.2.3.2 lists four spoil disposal methods proposed by the State of Colorado. A definitive plan will be developed during final design.

It is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with the letter and spirit of applicable environmental statutes, regulations and standards developed during final design.

1515.118

As discussed in Volume IV, Appendix 7, Section 7.1.3.2.G, the water supply for the SSC construction and operations would be provided by wells of the Morgan County Quality Water District. The aquifers involved could be augmented, by recharge, using surface water transferred from the Colorado River basin to the Big Thompson River, and then diverted to an existing distribution system (the Colorado-Big Thompson or CBT project). Water rights would be purchased from current CBT water users. Therefore, the aquifer augmentation would not require additional interbasin water transfer from the Colorado River. By using the augmentation process, the SSC project would not cause additional depletion of groundwater flow contributing to the South Platte River.

1515.119

Discussion of potential impacts of the SSC project on surface runoff and erosion and possible impact mitigations are presented in Volume I, Chapter 5, Section 5.1.2.1 and Volume IV, Appendix 7, Section 7.1.2.2. During the SSC design phase, a site-specific surface runoff and erosion control plan will be developed.

1515.120

See Comment Response 1515.121.

1515.121

The management practices suggested in the comment, if implemented, could reduce any negative impacts to the environment, as discussed in EIS Volume IV, Appendix 11, Section 11.3.2. Development of site-specific mitigative measures must await preparation of the Supplemental EIS for the selected site.

1515.122

Details and scheduling of construction activities will be decided upon final design and addressed in a Supplemental EIS for the selected site.

1515.123

See Comment Response 1515.122.

1515.124

See Comment Response 1515.122.

1515.125

See Comment Response 1515.122.

1515.126

Appropriate structures such as bridges and culverts would be used at stream crossings to pass flood flows. Detailed road designs await final site design. They will be addressed following site selection and will be addressed in the Supplemental EIS.

1515.127

It is DOE policy to minimize use of materials such as pesticides and rodenticides at DOE facilities because of their potential for negative environmental impacts.

1515.128

The DOE construction contractor for the SSC project would follow this procedure since it would be in accordance with standard DOE required procedures (Volume I, Chapter 6).

1515.129

See Comment Response 1515.128.

1515.130

Conceptual wastewater management for the proposed Colorado SSC construction and operations is outlined in Volume IV, Appendix 7, Section 7.1.3.2 and Volume IV, Appendix 10, Section 10.3.3. During the project design phase, a site-specific plan for wastewater treatment and disposal (including construction equipment washwater) would be developed.

1515.131

This comment conforms to the discussion of impacts and mitigation measures in EIS Volume IV, Appendix 15, Section 15.1.2 and Volume I, Chapter 5, Sections 5.1.9.C and 5.1.9.D.

1515.132

The comments regarding water quality impacts and mitigations for the construction and operations of the SSC are noted. Potential water resources impacts and mitigations are discussed in EIS Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.2 and Volume IV, Appendix 7, Sections 7.1.3.2 and 7.2.3.2. Detailed site environmental control or mitigation plans will be prepared for the selected site.

1515.133

Impacts to wetlands associated with the proposed SSC site in Colorado are discussed in EIS Volume I, Chapter 5, Section 5.1.5.3.B and Volume IV, Appendix 11, Section 11.3.2.3. The State of Colorado's plans to mitigate wetland impacts acknowledged. Volume IV, Appendix 11, Section 11.3.2.3 discusses mitigations, including those planned by the State. (Also see Volume I, Chapter 3, Section 3.6.) If Colorado selected as the SSC site, more detailed plans for wetlands mitigation would be included within the Supplemental EIS. There would also be a more detailed analysis of potential impacts to ecologically significant wetlands such as those along the proposed east-west access road.

1515.134

See Comment Response 1278.11.

1515.135

The necessity for vegetation impact mitigation is not solely connected with or dependent on species of special concern which may be in the area. Detail mitigations will be evaluated in the Supplemental EIS for the selected site.

1515.136

The estimates of areas to be disturbed have been revised throughout the text. For Colorado, a total of 3,395 acres would be disturbed. Of this area, 1,327 acres would be permanently disturbed by buildings and support facilities (Volume I, Chapter 3, Table 3-2). Impacts to the environment specified in the comment have been noted. Potential loss of habitat to Federal and State-protected or candidate species has been addressed in Volume I, Chapter 5, and Volume IV, Appendix II, Section 11.3.2.2. Included are discussions of best engineering measures used to control and mitigate construction impacts. The DOE has committed, in Volume I, Chapter 3, Section 3.6, to avoiding construction in wetlands and other sensitive areas to the extent practicable. As suggested by the commenter, potentially effective measures for protecting ecological resources in the site area include minimizing the use of fencing, purchasing and protecting additional such habitats to compensate for those adversely affected, controlling public access while providing for multiple use, and improving habitat.

Should the Colorado site be selected for the SSC, all sensitive habitats potentially affected by project development would be surveyed and evaluated for adverse impacts. At that time, the proposed mitigation measures would be reevaluated and revised to be site- and activity-specific. It is expected that State wildlife and fisheries personnel would have a role in reviewing and modifying, as necessary, any construction and mitigation plans to protect valuable ecological resources. The results would be reported in a Supplemental EIS. During site preparation, engineering control and mitigation measures would be monitored for effectiveness, and modified to be more effective or to avoid secondary impacts.

1515.137

The Supplemental EIS will examine in more detail the mitigations needed for the selected site. The proposed mitigation measures outlined in the comment will be evaluated during the design stage, if Colorado is the selected site.

The estimates of areas to be disturbed have been revised throughout the text. For Colorado, a total of 3395 acres would be disturbed. Of this area, 1327 acres would be permanently disturbed by buildings and support facilities (Volume 1, Chapter 3, Table 3-2). Impacts to the environment specified in the comment have been discussed in Volume I, Chapter 5, Sections 5.1.5 and 5.2. Potential loss of habitat to federal and State-protected or candidate species has been addressed in Volume I, Chapter 5, Section 5.1.5.2.B and Volume IV, Appendix 11, Section 11.3.2.2. Included are discussions of best engineering measures used to control and mitigate construction impacts. The DOE has committed, in Volume I, Chapter 3, Section 3.6, to avoiding construction in wetlands and other sensitive areas to the extent practicable. As suggested by the commenter, potentially effective measures for protecting ecological resources in the site area include minimizing the use of fencing, those adversely affected, controlling public access while providing for multiple use, and improving habitat.

Should the Colorado site be selected for the SSC, all sensitive habitats potentially affected by project development would be surveyed and evaluated for adverse impacts. At that time, the proposed mitigation measures would be reevaluated and revised to be site- and activity-specific. It is expected that State wildlife and fisheries personnel would have a role in reviewing and modifying, as necessary, any construction and mitigation plans to protect valuable ecological resources. The results would be reported in a Supplemental EIS. During site preparation, engineering control and mitigation measures would be monitored for effectiveness, and modified to be more effective or to avoid secondary impacts.

1515.138

The DOE has reviewed these plans submitted as comment to the DEIS. As a portion of the Supplemental EIS, more definite and specific mitigation plans will be prepared for the selected site. Mitigations are summarized in Volume I, Chapter 3, Section 3.6. The DOE would work with Colorado to prepare such plans.

1515.139

Comments noted.

1515.140

Comments noted.

1515.141

See Comment Response 1515.133.

1515.142

Comments noted.

1515.143

The EIS discusses positive impacts of the proposed new and upgraded roads in Colorado as well as a potential negative impact due to land development and new traffic (EIS Volume IV, Appendix 14, Section 14.2). Mitigation measures would be developed to minimize the effects of these impacts.

1515.144

The DOE considers the comment to be a clarification of the proposal. The DOE has determined that the information is not significant to conclusions or impacts identified in the EIS. See Comment Response 710.01.

1515.145

Discussion in Volume IV, Appendix 14, Section 14.2.1.3.B describes the proposed east-west highway as a "limited access" road and also mentions the benefits to the local east-west traffic and potential impacts to north-south traffic.

1515.146

Traffic analyses for each of the seven sites are presented in EIS Volume IV, Appendix 14, Section 14.2.1.3. These analyses were based on the site access plans proposed by the states. The analyses were performed in a consistent manner for each of the sites except for the eastern half of the Illinois site which required special treatment because of its urban nature. The analyses concentrated on general access to major SSC locations from large population centers for both construction and operations. The analyses represent a reasonable evaluation of traffic impacts for the purposes of this siting EIS. Traffic impacts will be analyzed in greater detail in the Supplemental EIS.

1515.147

Many of the states provided plans in their proposals for the upgrading of existing roads and bridges. These plans are addressed in EIS Volume IV, Appendix 1, Section 1.2.

Access routes to and from SSC facilities and spoils disposal areas will not be finalized until the DOE agrees to a final placement and design of the SSC, including spoil disposal areas and other ancillary facilities. At that time, selected access routes will be surveyed to determine their

ability to accommodate SSC loads. Plans will then be developed to upgrade roads and bridges accordingly. The selected state will be responsible for the upgrading of existing roads to satisfy the SSC transportation needs.

1515.148

See Comment Response 577.02.

1515.149

Comment noted.

1515.150

Scientific names have been corrected in the EIS Volume IV, Appendices 5 and 11.

1515.151

See Comment Response 1515.150.

1515.152

See Comment Response 1515.150.

1515.153

EIS Volume IV, Appendix 15, Section 15.2.3.2 has been revised to reflect the suggested correction.

1515.154

EIS Volume IV, Appendix 15, Section 15.2.3.2 has been corrected in the Errata to reflect the suggested changes.

1515.155

EIS Volume IV, Appendix 15, Section 15.2.3.2 has been revised to reflect the suggested clarification.

1515.156

EIS Volume IV, Appendix 15, Section 15.2.3.2 has been revised to reflect the suggested typographical correction.

1515.157

The clarification is noted. See Comment Response 1515.154.

1515.158

EIS Volume IV, Appendix 15, Section 15.2.3.2 has been revised to reflect this clarification.

1515.159

EIS Volume IV, Appendix 5 references have been revised to reflect the clarification.

1515.160

EIS Volume IV, Appendix 15 references have been revised to reflect the suggested correction.

1515.161

EIS Volume IV, Appendix 15 references have been corrected in the Errata.

1515.162

EIS Volume IV, Appendix 15 references have been revised to reflect the suggested correction.

1515.163

See Comment Response 1515.109.

1515.164

EIS Volume IV, Appendix 15, Section 15.1.3.2 has been revised to reflect a clarification.

1515.165

EIS Volume IV, Appendix 15, Section 15.1.3.2 has been corrected in the Errata to reflect this clarification. Field survey is needed to verify the precise location of site WN-10.

1515.166

See Comment Response 1515.67.

1515.167

See Comment Response 1068.24

1515.168

See Comment Response 577.06.

1515.169

As discussed in EIS Volume I, Chapter 5, Section 5.1.2.1, stream diversions required for constructing the SSC at either the Arizona or Colorado site alternatives would involve a large change in drainage area or permanent diversion of large stream beds. At the other site alternatives, drainage area changes would be comparatively small, and channel relocations would involve relatively small streams.

1515.170

The comment concerning the existing of floodplains is noted. It is generally true in the United States that nonexistence of FEMA insurance maps does not necessarily indicate an absence of flooding or floodplains but does indicate little development in the area and; consequently, insignificant flooding damage to existing properties. If the Arizona site is selected, additional information on floodplains will be developed for use in siting SSC facilities and other future development. Such information will be documented in the Supplemental EIS.

1515.171

See Comment Response 1068.24.

1515.172

Discussion of the floodplain impacts at the Colorado site presented in Volume I, Chapter 5, Section 5.1.2.2 confirms the comment.

1515.173

Volume IV, Appendix 7 and Volume I, Chapter 5 have been revised to include additional floodplain encroachment maps. All known encroachments are shown in figures and discussed, including K3 and K6 at the Colorado site.

1515.174

See Comment Response 577.06.

1515.175

Comment noted regarding discussion of flooding along the South Platte River and its tributaries presented in EIS Volume IV, Appendix 5, Section 5.2.2.1.A. It is believed that this paragraph presents valuable

and accurate information concerning flooding and its causes along the South Platte River and its tributaries. The next to last sentence has been revised.

1515.176

Comment noted regarding surface water information presented in the second table in EIS Volume IV, Appendix 5, Section 5.2.2.1.A. No gauge data are available for the streams crossing the site. This table does contain gauge information concerning perennial rivers in the vicinity of the site which are involved in proposed water supply options.

1515.177

The Colorado Water Conservation Board recommended the use of 100-year floodplain maps prepared by URS Corporation (1988) for the board. These "CWCB" floodplain maps are the best available information for floodplain encroachment assessment. The maps were produced using U.S. Army Corps of Engineers' HEC1 model and USGS topographic maps. They cover the whole proposed SSC surface footprint. They indicate that there are floodplain encroachments at J2, E1, E3, F3, K3, K6, E8, and F8. Discussion of the floodplain encroachments and figures have been added to Volume IV, Appendix 7, Section 7.1.3.2 and Volume I, Chapter 5, Section 5.1.2.

1515.178

See Comment Response 577.06.

1515.179

Volume IV, Appendix 5, Section 5.2.9, Figure 5.2.9-1 has been corrected in the Errata.

1515.180

Potential impacts to wetlands have been reassessed, and now focus upon wetlands encroachment at sites where surface facilities could be located (see Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.8.3). Wetlands maps for surface facility sites that may encroach upon wetlands are also included within Appendix 11. As a result, the site-wide wetland maps have been deleted from Volume IV, Appendix 5. Table 5.4.9-5 in Volume IV, Appendix 5 has also been deleted to maintain uniformity in wetlands presentation throughout Volume IV, Appendix 5. The information within that table has been incorporated into Volume IV, Appendix 11, Section 11.3.4.3.

1515.181

See Comment Response 577.02.

151515163358829

1515.182

See Comment Response 577.02

1515.183

Comment noted.

1515.184

See Comment Response 577.02.

1515.185

Comment noted.

1515.186

See Comment Response 577.02.

1515.187

Comment noted.

1515.188

See Comment Response 1068.20.

1515.189

See Comment Responses 1515.18 and 1515.190.

1515.190

The U.S. Soil Conservation Service identified no acres of prime farmland and 4,198 acres of important farmland in the SSC fee simple area. From this inventory, an estimated 819 acres would be permanently converted at the proposed Colorado site. This acreage represents less than one percent of the State's farmland inventory, and is less than the average acreage taken out of production each year as a result of development. (See Volume IV, Appendix 13, Section 13.2.3.2). See Comment Response 1515.19 for a discussion of how these results are interpreted.

1515.191

EIS Volume IV, Appendix 5, Section 5.2.10 discusses existing land use plans, policies, and controls at regional and local levels of government. Both Morgan and Adams Counties have comprehensive plans for their respective jurisdictions; Washington County does not, given its predominantly low growth and rural character. While loss of prime farmlands

may not be a critical issue in those counties with comprehensive plans, both Morgan and Adams Counties are initially concerned with planning for orderly growth and conserving environmental resources including productive farmlands.

1515.192

The passages cited in the comment accurately reflect the EIS land use analyses and impact assessments for Colorado, the details of which may be found in Volume IV, Appendix 13, Sections 13.1.3.2 and 13.2.3.2.

The EIS does not anticipate a strong "boom-bust" situation in Colorado as a result of the SSC. Although it suggests that parts of the Colorado Region of Influence "may experience some of the classic boomtown effects ... no real 'bust' would be forthcoming as the early newcomers are replaced by the more permanent newcomer group" (Volume IV, Appendix 14, Section 14.1.3.2.E). Moreover, the EIS concludes that "adverse social impacts should be temporary, and conditions are likely to become improved in the long run over what they would be without the SSC" (Volume IV, Appendix 14, Section 14.1.3.2.E). These conclusions do not appear unduly severe, and should not be minimized further.

1515.193

Comment noted.

1515.194

The text in Volume I, Chapter 4, Section 4.2.1.1 has been revised in response to your comment.

1515.195

Comment noted regarding surface water quality information presented in the DEIS in the first table in Volume I, Chapter 4, Section 4.2.1. Data used in this table and also presented in the table in Volume IV, Appendix 5, Section 5.2.2.1.B., were supplied by the State of Colorado and are the best available for water quality in the South Platte River. It is recognized that the sampling site is located over 50 miles upstream on the South Platte River from the confluence of the South Platte River and Beaver Creek. The data were used because the South Platte River is the only perennial stream in the area and would receive any drainage emitting from the SSC site. If the Colorado site is selected, and more applicable data are available, they will be utilized in the Supplemental EIS. Parameters such as turbidity that have no standards or for which there are no data have been deleted from the EIS, Volume IV, Appendix 5, Table 5.2.2-3 (see Errata).

1515.196

The comment regarding Badger and Beaver creeks' runoff records presented in Volume IV, Appendix 5, Section 5.2.2.1.A is noted. It was recognized that discharge records for Kiowa and Bijou creeks did not apply directly to the SSC site; these data, along with drainage areas presented, do provide an indication of typical runoff conditions in the area.

1515.197

Comment noted regarding value of Table 5.2.2-2 in Volume IV, Appendix 5, Section 5.2.2.1. It is felt that there is value in presenting these off-site discharge records. The 1965 storm (the largest storm ever recorded in eastern Colorado) had a major impact on the Badger Creek and Beaver Creek Basins. Any major rainstorm upstream of the site may affect the site.

1515.198

The text in Volume IV, Appendix 5, Section 5.2.2.1.B has been revised. Also see Comment Response 1515.96.

1515.199

See Comment Response 1515.195.

1515.200

EIS Volume IV, Appendix 7, Section 7.1.3.2.F.1 has been revised.

1515.201

The State of Colorado has not proposed a treatment and disposal method for the industrial wastewater (cooling tower blowdown). The DOE proposes a centralized evaporation pond for disposal of all cooling tower blowdown generated by the SSC. The text has been revised in EIS Volume IV, Appendix 7, Sections 7.1.3.2.F.2 and 7.2.3.2.B.2.

1515.202

EIS Volume IV, Appendix 10, Section 10.3.3.1.B has been revised in response to the comment.

1515.203

Comment noted.

1515.204

The EIS has been changed to acknowledge that the TSP 24-hour AAQS of 150 $\mu g/m^3$ is either a primary or a secondary standard at all site alternatives. Additional fugitive dust mitigations have been included to reduce the TSP impact to comply with the primary standards (see Comment Response 1278.11).

The value used as background at the proposed Colorado site is 160 $\mu g/m^3$ (EIS Volume I, Chapter 4, Section 4.4.2) which indicates that the area may already exceed the AAQS. The background monitoring data should be reevaluated with respect to the EPA fugitive dust policy for rural areas. It may be possible to use a lower value from existing data.

If the value stands and the site is candidate for TSP nonattainment, TSP mitigations to lowest achievable emissions rate (LAER), TSP offsets, and any other requirements of Colorado law would have to be complied with in obtaining any required permits to construct. This would be discussed in the Supplemental EIS if the Colorado site is selected.

The referenced language in Volume IV, Appendix 8 has been deleted.

1515.205

An environmental assessment covering the proposed highway projects in Colorado would be required by State law. Secondary impacts are discussed in EIS Volume I, Chapter 5, Section 5.2.

1515.206

Comment noted. See also Comment Response 1278.11. Additional mitigations should allow for acceptable PM_{10} impacts.

1515.207

All references to TSP AAQS have been corrected in response to prior comments to acknowledge that they are now state, not national standards. The secondary standard of 150 $\mu g/m^3$ 24-hr average has also been addressed in EIS Volume IV, Appendix 8, and Volume I, Chapter 5, as appropriate. Background data may be capable of being lowered in accordance with EPA's fugitive dust policy for rural areas.

1515.208

The comment is correct. Ozone is not directly emitted. EIS Volume IV, Appendix 8, Section 8.1 has been revised to show hydrocarbons (VOCs) as a precursor of ozone. See Comment Response 1322.103.

1515.209

The maximum 24-hr TSP value is from Pawnee Generating Station data; the annual TSP geometric mean value was measured at Brush. This has been reflected in the Errata to EIS Volume I, Chapter 4 and to Volume IV, Appendix 5.

1515.210

All seven BQL states, at their option, continue to enforce the former primary and secondary TSP NAAQS. North Carolina has a TSP standard of 150 $\mu g/m^3$ 24-hour average as a primary standard. Other than these exceptions, none of the alternative sites has more stringent air quality standards than the Federal standards. EIS Volume IV, Appendix 8 has been revised to incorporate these facts.

1515.211

In Volume I, Chapter 4, Section 4.7.5.1, it is noted that the bighorn sheep contributes to the uniqueness of the Arizona project site. The bighorn sheep are also identified in Volume IV, Appendix 5, Section 5.1.9.5.C.2 as being more susceptible to diseases when stressed by such factors as lack of water, crowding, loud noises, or human disturbances. It is possible that the presence of humans and SSC construction and operations noise may adversely affect bighorn sheep populations in Arizona. If the Arizona site is selected, additional consideration of the impacts of these combinations of stress on the sheep populations would be studied in more detail in a site-specific Supplemental EIS. The DOE would anticipate working with State and Federal agencies to develop an approach that would minimize impacts to the desert bighorn.

1515.212

The DOE believes the comparative analysis of impacts in Volume I, Chapter 3 represents a reasonably accurate picture of impacts that would occur at each site. The analysis was based on state-furnished data, and the DOE believes that the EIS is sufficient in its analysis of state proposals to make a siting decision.

1515.213

Both in absolute and relative terms, SSC-related employment will be substantially higher than that experienced during the Pawnee Power Plant project. For example, the peak construction work force for the SSC is projected at nearly 4,000 persons (EIS Volume IV, Appendix 14, Section 14.1.3.2.A), as opposed to the 2,200 peak associated with the Pawnee Power Plant. SSC construction will also take more than three times as long as did the Pawnee Power Plant, among other things arguing for a greater likelihood that construction workers would relocate to areas near the proposed SSC site as opposed to commuting from elsewhere

(primarily Denver); this would in turn generate greater secondary employment impacts. Finally, operation of the SSC would require roughly 25 times more personnel than are required at the Pawnee Power Plant. The Morgan County area, and Fort Morgan and Brush in particular, have not recently experienced economic impacts either of the magnitude or duration of those anticipated to accompany the SSC.

As the commenter points out, the EIS assessment of SSC-related housing impacts in Morgan County in part bases its conclusion upon the relatively few units constructed in the county between 1980 and 1987, and in part upon the low-to-moderate vacancy rates in the county (Volume IV, Appendix 14, Section 14.1.3.2.B). In contrast to the commenter's claim, the latter indeed does reflect available housing supply. The former, in turn, provides an indication of how successfully an area might respond to increased demands for housing. Moreover, regardless of the logical foundation of these measures (the comment notes that they reflect low demand in Morgan County) the fact remains that a limited number of housing units are available for occupancy in Morgan County, and a limited number have been built over the past several years. Increased construction of year-round housing within Morgan County, perhaps making use of platted lots with utility connections, would help to mitigate anticipated impacts on housing demand.

Noteworthy impacts to public services in Morgan County are anticipated to accompany SSC-related population influx, with associated increases in demand for education, public safety, and health care. Increased staffing would provide an important means of mitigating many of these impacts.

The EIS does not indicate that the State of Colorado, or various affected local jurisdictions, would be unable to respond to SSC-related impacts. Rather, it suggests that focused efforts would be required in certain instances. Past experience of various agencies in dealing with project-related population increases, and the commitment of both State and local agencies and organizations, would constitute parts of such an effort.

1515.214

See Comment Response 1515.34.

1515.215

Comment noted.

1515.216

EIS Volume IV, Appendix 1, Figure 1.2.2-4 depicts the electric transmission lines for the SSC as originally proposed by Colorado and as subsequently confirmed in meetings and telephone conversations with proposer staff. The comment correctly states that the State of Colorado

has revised the proposed layout after the STF site visit during July 1988; however, this revision was received too late to be included in the EIS analysis. It is expected that the latest site data will be taken into consideration in the Supplemental EIS, in the event that the Colorado site should be selected.

1515.217

The base map used for Volume IV, Appendix 1, Figure 1.2.2-5 is to scale. The superimposed proposed SSC roads and utilities are also to scale with regard to overall length but not with regard to details. The following note has therefore been added: "Details Not To Scale".

1515.218

The Conceptual Design Report, Attachment C, March 1986, states a voltage requirement for construction purposes to be 13.8 kV. The comment refers to a voltage level of 7.2 kV which is unacceptable. The 12.5 kV and 115 kV values stated in the comment are satisfactory and Volume I, Chapter 4, Section 4.9.2.2, Table titled "COMPARISON OF EXISTING UTILITY SYSTEMS IN THE REGION OF THE SITE ALTERNATIVES" AND Volume IV, Appendix 14, Section 14.2.2.3 B.1.2 has been corrected in the Errata to clarify the service voltages available for construction power.

1515.219

The suggested addition does not affect the analysis or conclusion of the EIS. Therefore, no revision has been made. A detailed analysis of potential impacts will be included in a Supplemental EIS for the selected site.

1515.220

The EIS Volume IV, Appendix 4, Table 4-30 has been revised to reflect construction power voltages of 7.2, 12.5 and 115 kV.

1515.221

Volume IV, Appendix 5, Section 5.2.11.2 B.1.a has been corrected in the Errata to clarify the serving electric utility.

1515.222

Volume IV, Appendix 5, Section 5.2.11.2 B.1.c, paragraph 1 has been corrected in the Errata to clarify the source of electric energy for MCREA.

1515.223

EIS Volume IV, Appendix 5, Section 5.2.11.2 B.1.e has been corrected in the Errata.

1515.224

EIS Volume IV, Appendix 5, Section 5.2.11.2, Table 5.2.11-11, has been corrected in the Errata to match the original source of data as listed in the reference list. The table is not modified to match the comment data because the intent of the table is to relate the generating capacity to the load on an historical basis.

1515.225

See Comment Response 1515.218.

1515.226

EIS Volume IV, Appendix 14, Section 14.2.2.3.B.1.a.3 has been corrected in the Errata to clarify the status of agreements between the utilities and the DOE.

1515.227

The total number of miles of new transmission lines is given in Volume I, Chapter 3, Section 3.4.1, Table 3-3. The repetition of this value in Volume IV, Appendix 14, Section 14.2.2.3.B.1.a.3 is not necessary to clarify the document.

1515.228

Volume IV, Appendix 14, Section 14.2.2.3.B.1.a defines the abbreviation for Public Service Company of Colorado as PSCo. Volume IV, Appendix 14, Section 14.2.2.3 B.1.a.3 has been corrected in the Errata to the proper abbreviation.

1515.229

EIS Volume IV, Appendix 14, Section 14.2.2.3 B.1.c has been corrected in the Errata to clarify which unit is referenced. This section has also been corrected in the Errata to clarify the source of electric energy for MCREA.

1515.230

The paragraphs referenced in the comment from EIS Volume IV, Appendix 14, Section 14.2.2.3 B.1.c are quotes from the North American Electric Reliability Council (NERC) report as referenced in the Errata. The information is presented here to give an overview of conditions in the region of the proposed site as viewed from the national council that is commissioned to monitor these matters. These statements are correct in the EIS. The paragraph in question is not editorial, but a presentation of factual information from NERC.

1515.231

EIS Volume IV, Appendix 14, Section 14.2.2.3 H.2 has been corrected in the Errata to correct the Pawnee Generating Station Unit 2 rating and correct the planned construction schedule for this Unit.

1516.01

As noted in Volume I of the EIS, the DOE recognized that a more detailed site-specific review will be required under NEPA prior to a final decision on the construction and operation of the proposed SSC. This more detailed review will be provided in the Supplement to the EIS. Mitigation strategies will also be described in greater detail in that Supplemental EIS.

1516.02

The recreational sections in Volume IV, Appendix 11 have been rewritten for all the states. Significant changes on recreational opportunities such as hunting, trapping, etc. would be analyzed in more detail once the SSC site is chosen and addressed in the Supplemental EIS (see Volume I, Chapter 1, Section 1.1). The comment that factors associated with SSC project siting and operation may alter the recreational activities and number of visitors in the area has been incorporated in Volume I, Chapter 5, Section 5.1.5.4

1516.03

In the Supplemental EIS more specific mitigations will be developed for the selected site. Prior to a decision to construct and operate the proposed SSC, DOE will prepare a supplement to this EIS to address in more detail the environmental impacts at the selected site and the alternatives for mitigating those impacts (EIS, Volume I, Foreword).

1516.04

Specially designed fencing is one alternative suggested (see EIS Volume I, Chapter 3, Section 3.6.3) as a possible mitigative measure to allow for bighorn sheep movement and migration. Other types of mitigation may be appropriate such as the suggestion of water development. These types of measures will be investigated further in a Supplemental EIS if the Arizona site is selected.

1516.05

The text has been revised as suggested.

1516.06

EIS Volume I, Chapter 4, Section 4.8.4 has been revised to reflect the suggested addition.

1516.07

EIS Volume I, Chapter 4, Section 4.8.5 has been revised to reflect the suggested addition.

1516.08

The last sentence of the first paragraph on page 5.1.2-30 of DEIS Volume I, Chapter 5, Section 5.1.2 has been changed to reflect the presence of one well in the affected area. The sentence previously indicated that there were no wells in the affected area. For the level of detail provided in this EIS, including the specific location is not necessary. This information will be used in preparing the Supplemental EIS if Arizona is the selected site.

1516.09

The list of protective and mitigative measures for the desert tortoise prepared by Ross is a good one. However, the DEIS inappropriately implied that the list was Bureau of Land Management policy. The text has been corrected, and this list, along with other potential mitigative measures, would be considered in the Supplemental EIS if Arizona is selected as the SSC site. See EIS Volume IV, Appendix 11, Section 11.3.1.2, and Volume I, Chapter 3, Section 3.6, and Chapter 5, Section 5.1.5.1.

Should the Arizona site be selected for the SSC, during the preparation of the Supplemental EIS, all interested Federal and State wildlife regulatory agencies will have an opportunity to provide additional input to a final set of proposed mitigative measures. Regulatory agencies will have an opportunity to provide input into a site-specific desert tortoise management plan. At that time, realistic mitigation for loss of habitat and individuals can be devised.

1516.10

The extent of the range available to the sheep, together with the fact that this range is currently below carrying capacity, suggests that there is only a small probability that construction noise will have a measurable long-term effect on the desert bighorn.

By avoiding blasting during rutting and lambing seasons, the effects of noise from blasting would be expected to be similar to those described, i.e., the bighorn may be temporarily displaced from areas adjacent to the noise sources but would not necessarily be inhibited from returning once they become acclimated to the noise.

If Arizona is selected as the location of the SSC, a detailed study of construction noise impacts on the bighorn will be included in the Supplemental EIS. For additional discussion see Volume IV, Appendix 11, Section 11.3.1.2.

1516.11

Comment noted. Volume I, Chapter 5, Section 5.1.7.1.C has been revised to reflect the suggested addition.

1516.12

Surface reclamation of the land would be addressed in the detailed, final decommissioning plan which would be written the end of SSC operations. NEPA activities will be performed for the decommissioning operations.

At the end of decommissioning, the access ways, tunnels, and shafts will be sealed. The exact method used would be decided in the decommissioning plan mentioned above. Necessary steps, including multiple barriers as required, would be taken to prevent access.

1516.13

The references for Volume IV, Appendix 5, Ecological Resources and Land Resources are included in the Errata for Appendix 5 of the EIS. They include all citations used in the text.

The ecological resources present at each of the SSC site alternatives are presented in Volume IV, Appendix 5. Only those species possibly affected by project construction or operations are addressed in Volume IV, Appendix 11.

1516.14

The statement is accurate as written, although it is agreed that this feature is not unique to desert scrub systems.

1516.15

It is true that the area on Figure 5.1.9.2 (see Volume IV, Appendix 5, Section 5.1.9.2) appears to be about 60 percent Arizona Upland and 40 percent Lower Colorado. However, the information in Table 5.1.9-1, and the text that refers to it, focuses upon the more immediate site footprint. Percentages for the two desert scrub associations within this area are closer to 70/30 percent. A text change has been made to emphasize that the collider footprint is being referred to in Table 5.1.9-1.

1516.16

The information provided by the commenter conflicts with information provided in the State of Arizona's SSC proposal. Figure 5.1.9-2 has not been altered. Should Arizona be selected, a more detailed vegetation study would be conducted so that sensitive habitat areas could be avoided during project construction and operation.

1516.17

Numbers of vertebrate species for the Arizona Upland association and Lower Sonoran Association are found in EIS Volume IV, Appendix 5, Section 5.1.9.2. B.3. The Sonoran Riparian Woodland data are not included because no examples of this plant association are present on the proposed site.

1516.18

The references in EIS Volume IV, Appendix 5, Section 5.1.9.2.B.3 for each species have been corrected in the Errata for Volume IV, Appendix 5.

1516.19

Based on information obtained since preparation of the EIS, Volume IV, Appendix 11 has been revised to indicate that Swainson's hawk is primarily a migrant species in Arizona and would be expected to occur in and around agricultural areas. It is not expected to nest in areas likely to be affected by the proposed SSC project.

1516.20

Information contained in the comment has been incorporated as Errata for the text in Volume IV, Appendix 5, Section 5.1.9.4.

1516.21

The corrected spellings for Swainson's hawk (Buteo swainsoni) and the Tumamoc globeberry (Tumamoca macdongallii) appear in the Errata section of Volume IV, Appendix 5.

1516.22

The suggested corrections appear in the Errata for Volume IV, Appendix 5.

1516.23

The density of desert tortoises reported in EIS Volume IV, Appendix 5, Section 5.1.9.5.B.1, has been corrected to 57/mi^2.

1516.24

Figure 5.1.9-3 of EIS Volume IV, Appendix 5, Section 5.1.9-5 shows high density desert tortoise habitat. This includes the southern portions of the ring area. The supporting text of EIS indicates that desert tortoise habitat consists of relatively undisturbed (ungrazed) mixed cacti/palo verde associations on the toes of slopes around the upper

bajadas and incised washes running out of the mountains. This habitat type would not only include the marked areas on Volume IV, Appendix 5, Figure 5.1.9-3, but other areas as well. If the proposed Arizona site is selected, all potential habitat for the desert tortoise, including areas indicated by the commenter, would be surveyed for the presence of the desert tortoise. Results of these studies, along with a more extensive assessment of impacts, would be reported in the Supplemental EIS.

1516.25

See Comment Response 1036.06.

1516.26

Volume IV, Appendix 5, Section 5.1.10, Figure 5.1.10-3 has been modified in the Errata to show the Wilderness Study Areas, the Butterfield Stage Route, and the De Anza Historic Trail.

1516.27

It is appropriate to discuss the BLM Wilderness Study Areas, both in terms of unique ecosystems in Volume IV, Appendix 5, Section 5.1.9.6 and as a form of specialized land use in Section 5.1.10.2.

1516.28

In order to maintain consistent EIS format, these headings were not added.

1516.29

The reference in Volume IV, Appendix 5, Section 5.1.10 to the Wilderness Study Area Figure 5.1.9-5 should be to Figure 5.1.10-3. Figure 5.1.10-3 is revised to show the Wilderness Study Areas, the Butterfield Stage Route, and the De Anza Historic Trail and is included in the Errata to Appendix 5.

1516.30

EIS Volume IV, Appendix 5, Section 5.1.10.2.A.3 has been corrected in the Errata to reflect the suggested changes.

1516.31

EIS Volume IV, Appendix 5, Section 5.1.10 was corrected in the Errata to Appendix 5 to coincide with BLM wilderness recommendations presented in Section 5.1.9.6.

1516.32

Volume IV, Appendix 5, Section 5.1.10.2.A.3 has been corrected in the Errata to reflect the suggested changes.

151515163358842

1516.33

The paragraph starting with "As the AUM ..." in EIS Volume IV, Appendix 5, Section 5.1.10.2 A.3., has been deleted as requested. Information on the Beloat and South Vekol BLM grazing allotments has been inserted in its place, as requested.

The Beloat BLM grazing allotment will not be directly impacted by the SSC. However, it may be impacted by the construction of the expressway spur (Estrella Expressway) from Goodyear to I-8. This expressway is currently planned for construction after the year 2005 without the SSC. The State of Arizona has discussed the possibility of speeding up the construction schedule if the Arizona site is selected. The South Vekol BLM grazing allotment may be impacted by the potential groundwater drawn around the Vekol Valley well field as discussed in EIS Volume IV, Appendix 7, Section 7.2.3.1. The potential to affect a BLM well is also noted in the referenced text.

1516.34

Volume IV, Appendix 11, Section 11.3.1.2 has been revised to indicate that Neolloydia erectocentra is a Federal Category 1 plant species that has been observed in Maricopa County. It is a creosote-bursage shrub found on well-drained slopes and ridges.

A paragraph has been added to Section 11.3.1.2 that states that Swainson's hawk is a Federal Category 2 species which may be present as a migrant in and around agricultural areas near the site.

All references are cited in the revised Appendix 11.

The comment on BLM acceptance of mitigations presented in Section 11.3.1.2 is noted. Revised mitigative measures have been included based on present information about site conditions and local desert tortoise populations. Should Arizona be selected as the site for the SSC, the DOE is committed to working with all regulatory agencies involved with desert tortoise conservation to develop an acceptable mitigation plan.

1516.35

The text of Volume IV, Appendix 11, Section 11.3.1.2 has been revised to include the information concerning the life history and population distribution of the desert tortoise.

The comment regarding tortoise use corridors and noise impacts have also been addressed in Volume IV, Appendix II, Section 11.3.1.2; however, a thorough examination of the desert tortoise population at the site, as well as a more quantitative assessment of impacts, will be prepared for the Supplemental EIS should Arizona be selected as the site for the SSC.

1516.36

Volume IV, Appendix 11, Section 11.3.1.2. has been rewritten and the suggested changes incorporated in the text

1516.37

The comment on fencing as tortoise barriers in EIS Volume IV, Appendix 11, Section 11.3.1.4 is noted. If tortoise movement corridors are blocked by chain link fences, adverse impacts to the species could occur. Impact mitigation measures identified in Volume IV, Appendix 11, Section 11.3.1.2, include construction of barriers allowing tortoise passage in areas of high risk to tortoises or providing safe corridors around such areas.

The second paragraph of Section 11.3.1.4 now begins as suggested with the following sentence, "Some information is available on hunting frequency and success ratios in the area. In Unit 39 there were 971 hunter days, with a success ratio of 12.5 percent in 1985; however, BLM management...."

The list of mitigations is comprehensive. All mitigations will be reexamined in preparation of the Supplemental EIS if Arizona is selected for the SSC.

1516.38

Volume IV, Appendix 13, Section 13.1.3.1.C. has been corrected in the Errata to reflect the suggested addition.

1516.39

EIS Volume IV, Appendix 13, Section 13.1.3.1.F. has been corrected in the Errata to reflect the suggested clarifications.

1516.40

EIS Volume IV, Appendix 13, Section 13.1.3.1.F. has been corrected in the Errata to reflect the suggested additions.

1516.41

Volume IV, Appendix 13, Section 13.1.3.1.F has been revised to reflect the suggested revision. If Arizona is selected as the SSC site, a more detailed analysis of grazing allotment impacts and suggested mitigation measures will be included in the Supplemental EIS.

1516.42

See Comment Response 1516.41. SSC project development would likely cause some inconvenience to grazing operations, which could result in increased operating costs for both the permittee and the BLM.

1516.43

EIS Volume IV, Appendix 15, Section 15.1.1 has been corrected in the Errata to read: "The cultural resource assessments indicate that significant sites exist at each of the proposed SSC sites." The tables found within the EIS identify known cultural resources within or near the proposed project areas. In most cases, these have not been evaluated using eligibility criteria for the National Register of Historic Places. This eligibility will be determined after the SSC site has been selected and more extensive cultural evaluation begins. This is discussed in the methodology assessment (EIS Volume IV, Appendix 15, Section 15.1.2.3).

1516.44

EIS Volume IV, Appendix 15, Section 15.1.2.1.A has been revised to reflect the grammatical change.

1516.45

The statement in the comment, cited in EIS Volume IV, Appendix 15, Section 15.1.2.1 A.2, is made to introduce the issues pertaining to spatial concerns. Specifically, this statement focuses on the types of impacts and potential spatial circumstances of such impacts. It is a necessary part of the analysis and has not been deleted.

1516.46

EIS Volume IV, Appendix 15, Section 15.1.2.1.B has been revised to reflect the suggested change.

1516.47

Volume IV, Appendix 15, Section 15.1.2.2 has been revised.

The paragraph cited has been moved to Section 15.1.2.3 which discusses future assessment activities after site selection.

1516.48

EIS Volume IV, Appendix 15, Section 15.1.2.3 has been revised to reflect the suggested clarifications.

1516.49

EIS Volume IV, Appendix 15, Section 15.1.2.3 has been revised to reflect the suggested modifications.

1516.50

The reference cited has been added to the Reference Section of Volume IV, Appendix 15.

1516.51

EIS Volume IV, Appendix 15, Section 15.1.3.1 has been corrected in the Errata reflect to the suggested clarifications.

1516.52

EIS Volume IV, Appendix 15, Section 15.1.3.1, and the references, have been corrected in the Errata to reflect the suggested clarification.

1516.53

The referenced sentence has been deleted as suggested.

1517.01

Comment noted.

1517.02

See Comment Responses 10.03.

1517.03

The submitted information was reviewed during preparation of the Final EIS.

1517.04

This subject is addressed in the next to the last paragraph in Volume IV, Appendix 5, Section 5.4.2.2.C and in Appendix 7, Section 7.2.3.4.B.1, second paragraph. New data has been added to Appendix 7; see Comment Response 1517.148.

1517.05

The referenced materials were reviewed in the process of preparation of the Final EIS.

1517.06

The wetlands assessment has been revised to provide a more specific acreage of the wetland areas present at the Michigan site (see Volume IV, Appendix 11, Sections 11.2.2 and 11.3.4.3). This assessment identified approximately 567 acres of wetlands in the fee simple areas associated with surface facilities, and this acreage value has been incorporated into the EIS (see Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.4.3).

1517.07

The materials were reviewed in the process of preparation of the final EIS.

1517.08

See Comment Response 1517.09.

1517.09

Wetlands that may be affected by construction of the SSC in Michigan and at all sites have been uniformly re-evaluated on the basis of field surveys conducted by the DOE at the sites, U.S. Fish and Wildlife National Wetlands Inventory Maps, and aerial photographs (see EIS Volume IV, Appendix 11, Section 11.2.2 for wetlands assessment methodologies). These evaluations provided specific information on both wetlands quality and quantity that could be impacted at each of the sites.

15171525335881

Based on this re-evaluation, there are approximately 567 acres of wetlands in the areas associated with surface facilities for the proposed Michigan location. This and other information from the Michigan wetlands evaluation has been incorporated into EIS Volume I, Chapter 1, Table 1-1; Volume I, Chapter 5, Section 5.1.5.3; and Volume IV, Appendix 11, Section 11.3.4.3.

Mitigation for wetlands impacts (such as relocation of surface facilities) would be employed to reduce the impacts of SSC construction (see Volume I, Chapter 5, Section 5.1.5.3, Chapter 3, Section 3.6 and Volume IV, Appendix 11, Section 11.3.4.3) at any of the alternative sites. Detailed plans to mitigate any impacts to wetlands from construction and operation of the SSC at the selected site would be presented in the site-specific Supplemental EIS.

1517.10

See Comment Response 1517.135.

1517.11

The DOE acknowledges that transfer of ownership would not constitute a loss of wetlands. The EIS has been modified to reflect the fact that only wetlands within (or possibly immediately adjacent to) locations where surface facilities would be constructed would be adversely impacted by the SSC project (see EIS Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.4.3). The DOE will comply with Section 404 of the Clean Water Act and with permit requirements under these regulations. As stated in the EIS, most of the wetlands located in fee simple areas would be protected from impacts due to non-SSC related activities (e.g., agricultural and residential development).

Some uses of fee simple title areas may be allowed; however, this will be decided on a case-by-case basis. Use of such areas is constrained by safety and programmatic considerations. Potential impacts of any proposed use, including those to wetlands, would be considered along with possible mitigation before use would be authorized.

1517.12

Approximately 567 acres of wetlands at the Michigan site have been identified to occur within areas where surface facilities for the proposed SSC collider could be located (see Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.4.3). None of the wetland areas identified that are expected to be impacted by SSC construction or operations are located in the Haehnle Wildlife Sanctuary, Dansville State Game Area, or Waterloo Recreation Area, and no impacts to wildlife habitat in these areas are anticipated.

Mitigation measures for impacts to wetlands are discussed in Volume IV Appendix 11, Section 11.3.4.3 and could lessen impacts on wildlife habitats associated with wetland areas. More detailed information relative to wetlands mitigation at the selected site would be included in a site-specific supplement to the EIS.

1517.13

EIS Volume IV, Appendix 11 has been updated with additional site specific information. A worst-case analysis has been conducted for each State to identify potential impacts upon wetlands and threatened and endangered species. The tract of black spruce was included in the impact analysis because the details of plans for area J1 have not been finalized. It is acknowledged, however, that the probability of impacting this area is small. Should Michigan be selected, a site-specific Supplement to the EIS will be prepared prior to development of the final project design. Project facilities will be sited to avoid sensitive habitats, and appropriate mitigation measures will be identified.

1517.14

The authority uniquely granted to the State of Michigan to administer Section 404 of the Clean Water Act in that state is acknowledged in EIS Volume I, Chapter 6, Section 6.2.1 and Volume IV, Appendix 11, Section 11.3.4.3. For the other states, the COE and/or EPA have authority under Section 404 of the Clean Water Act to define and manage wetlands protection programs and would also exercise a commitment to the protection of wetlands.

1517.15

Wetlands that may be affected by construction of the SSC in Michigan have been evaluated on the basis of recent field surveys conducted at the site, U.S. Fish and Wildlife National Wetland Inventory Maps, and aerial photographs. This evaluation provided specific information of the quality of the wetlands that could be impacted at the Michigan location, and has been incorporated into Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.4.3.

1517.16

A variety of alternatives is possible for mitigating potential impacts to wetland areas that could be impacted at the Michigan site. Many of these are discussed in Volume IV, Appendix 11, Section 11.3.4.3. However, pending final site selection, engineering design, and facility siting, it is not possible to provide detailed mitigation plans. Mitigation measures designed in consultation with appropriate Federal and/or State agencies would be discussed in more detail in a site-specific Supplemental EIS.

1517.17

The wetland assessment presented in the EIS has been revised to include a reevaluation of wetland location, type, and quality (see EIS Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.4.3). A conservative estimate of the amount of wetlands that may be impacted by construction of the proposed collider facilities at the SSC in Michigan is now placed at approximately 190 acres. If future expansion areas are developed, the potential exists for about another 319 acres of wetland impacts. The acreage is a conservative estimate, that does not include mitigation, and provides a comparison among sites. Volume I, Chapter 5, Section 5.1.5.3 explains the difference in wetland acreages reported between the DEIS and the FEIS. Table 3-9 of EIS Volume I, Chapter 3, has been modified to accommodate these revised estimates. Wetland information has been deleted from Table 5.6-4 of Volume I, Chapter 5, as those data were inappropriate for Section 5.6.

1517.18

These materials were reviewed in the process of preparing the Final EIS.

1517.19

Table 1-1 of EIS Volume I, Chapter 1, which provides a brief summary of important impacts, has been modified to reflect that the overdraft is "limited localized." A summary of current water resources conditions, including the abundance of surface and groundwater supplies at the proposed Michigan site, is provided in Volume I, Chapter 4, Table 4-4, and the accompanying text in Volume I, Chapter 4, Section 4.2. The relevant details on current water resources conditions and projected water resources impacts are provided in Volume IV, Appendix 5, Section 5.4.2, and Appendix 7, Section 7.2.3.4, respectively.

1517.20

The data compilation and report referenced in this comment were not available for the preparation of the DEIS. These additional data have been utilized to revise and update the water availability and water use discussions in the document. See Comment Response 312.04.

1517.21

Availability of water at the proposed Michigan site is addressed in EIS Volume IV, Appendix 7, Sections 7.1.3.4 and 7.2.3.4 and supports this comment.

1517.22

Although the letter referenced in the comment was not available for the DEIS, the recovery of the water table in recent years in the Lansing and Jackson area was noted in Volume IV, Appendix 5, Section 5.4.2.2.C. Other additional data provided by the State of Michigan in the referenced letter and associated documents have been incorporated in the EIS

as appropriate. See Comment Response 312.04. The interpretation of a localized overdraft is based on the existence of an aerial and long-term historic decline in water levels in the primary aquifers. The comment on water rights and streamflow infiltration is noted.

1517.23

If the proposed Michigan site is selected for the SSC, the site-specific Supplemental EIS will address local drawdowns, whether stable or unstable, in more detail.

1517.24

See Comment Responses 312.04 and 1517.19.

1517.25

The information given in the comment is consistent with discussions in Volume IV, Appendix 7, Section 7.2.3.4.

1517.26

These commitments on the behalf of the State are noted.

1517.27

See Comment Response 1482.07.

1517.28

The referenced information was reviewed in the process of preparing the Final EIS.

1517.29

See Comment Responses 277.02 and 277.03.

1517.30

The information was reviewed during the preparation of the Final EIS. If the proposed Michigan site is selected for the SSC, considerably greater geological detail will be required at the specific location of the facilities. This would be addressed in the Supplement to the EIS.

1517.31

Figure 5.4.1-6 of Volume IV, Appendix 5 has been revised to incorporate data on oil and gas well locations received from the Michigan Department of Natural Resources in August 1988.

1517.32

Attached information was reviewed in the preparation of the Final EIS.

15171525335885

1517.33

See Comment Response 1517.35.

1517.34

See Comment Response 1517.35.

1517.35

The geotechnical information submitted by Dr. Chung in his June 8, 1988 letter was included in the database used in preparation of the EIS.

EIS Volume I, Chapter 3, Section 3.4.4 states that for the purpose of the analysis in the DEIS, the MEB and HEB portions of the injector facilities were located near the surface in cut-and-cover construction. This was done to provide a common basis for analysis and comparison among the alternative sites.

It has been recognized that all sites possess various aspects of flexibility with regard to location of underground facilities. After the final site is selected, exact locations will be determined during final design and addressed in the Supplemental EIS. The State's alternatives could be addressed at that time.

1517.36

The attached information was reviewed during the preparation of the Final EIS.

1517.37

Comments noted. See all the Comment Responses for letter 1515.

1517.38

The air quality portion of Table 1-1 was deleted in response to comment 1278.11. Additional fugitive dust mitigation eliminated anticipated TSP AAQS exceedance in all states so the line indicating AAQS exceedance has been deleted.

We agree that the TSP data from Lansing and the CO data from Detroit, both urban, are not representative of the rural site.

Volume I, Chapter 4, Table 4-6 been modified with a footnote explaining high carbon monoxide levels in Michigan. See Comment Response 1322.96. Volume 8, Table 8-33 has been modified with a footnote indicating that the TSP background may not be representative of the site.

1517.39

See Comment Responses 1322.96, 1322.98, and 1322.108.

15171525335886

1517.40

The comment regarding errors in surface water quality information presented in the table titled "Surface Water Quality Data In Project Vicinity" in Volume IV, Appendix 5, Section 5.4.2.2.B is noted. These errors have been corrected. See Comment Responses 1517.163 through 1517.169.

1517.41

The percentages in EIS Volume IV, Appendix 6, Section 6.4.3.2 were derived directly from Michigan's Figure ER-1 (rev. 2). They differ slightly from K.Y. Chung's estimates (which were considered) in that they include spoils from the experimental hall excavations as well as from the collider tunnel. The percentage of Saginaw Formation in Volume IV, Appendix 6, Section 6.3.4.2 has been corrected to 69 percent in the Errata.

1517.42

See Comment Response 1517.161.

1517.43

If the Michigan site is selected, the Supplemental EIS will contain all recent test data. EIS Volume IV, Appendix 6, Section 6.3.4.2 and Volume IV, Appendix 10, Section 10.2.3.4 describe the manner in which leachable spoils would be handled.

1517.44

The attached information was reviewed in the process of preparing the Final EIS.

1517.45

Results of a recent post-DEIS survey of potential summer habitat for the Indiana bat conducted by the DOE have been added to EIS Volume IV, Appendix 11.

After the SSC site is selected, all areas that are likely to be adversely affected by project development would be surveyed for the presence of unique and sensitive habitats and for rare and protected species to determine the presence of such species and to evaluate the potential effects of project development. Results of this research effort would then be addressed in a Supplemental EIS. Information would also be used, in consultation with USFWS and the State Department of Natural Resources during the preconstruction and construction phases, to develop and implement effective mitigation measures. Mitigating planning measures pertaining to impacts on site-specific unique and sensitive habitats will be included in the Supplemental EIS after the site selection has occurred.

15171525335887

1517.46

See Comment Response 1517.45.

1517.47

The 125 prehistoric archaeological sites in Michigan cited in EIS Volume I, Chapter 4, Section 4.10.1.1. are located in the vicinity of the proposed SSC site; an archaeological survey of potential impact areas has not been undertaken. This section further states, "A minimum of 82 historic archaeological sites are predicted within the project site. These are projected based upon the study of historic maps; however, they have not been verified by field study. Further studies will be conducted and more information will be included in the Supplemental EIS if Michigan is chosen as the selected site.

See Comment Response 570.01.

1517.48

The seven sites cited are only those that have been recorded to date within potential impact areas of the Michigan SSC site. It is expected that additional prehistoric sites may be located during intensive field surveys that would be performed. Historic archaeological sites are also expected to be identified.

If the DOE selects the Michigan SSC site, archaeological field surveys and evaluations would be completed in order to identify cultural resources within the project area that are eligible for listing on the National Register of Historic Places. All cultural resource management procedures would be completed in accordance with a Memorandum of Agreement (MOA) between the DOE and the Michigan State Historic Preservation Officer (SHPO). Mitigation measures would be developed to appropriately mitigate impacts to significant cultural resources (see Volume I, Chapter 3, Section 3.6).

1517.49

See Comment Responses 1517.52 and 1517.53.

1517.50

The Soil Conservation Service identified 4,002 acres of prime farmland and 2,658 acres of important farmland in the SSC fee simple area. From these inventories, an estimated 341 acres of prime and important farmland would be permanently converted by the project at the proposed Michigan site. These revised estimates have been incorporated into the FEIS. This acreage represents less than 1 percent of the State's prime and important farmland inventory, and is less than the average acreage taken out of production each year as a result of urban development. It is expected that the impact on agricultural business, while noticeable

at the local level, will not be significant at the regional level. See Volume I, Chapter 4, Section 4.8.6, Chapter 5, Section 5.2.11, and the Errata to Volume IV, Appendix 13.

1517.51

See Comment Response 1517.58.

1517.52

The figure cited in the comment (6,680) is the projected total population impact to the entire Michigan Region of Influence (ROI) during the peak year of SSC construction, not in-migrant workers to Stockbridge area alone as the comment states. Total population impacts include in-migrant workers, their families, and whatever natural population increase accompanies that influx of population over time. The Michigan ROI includes 12 counties (see EIS Volume I, Chapter 5, Section 5.1.8.1). Mainly due to high unemployment in the region, coupled with a large labor force, estimates of in-migration to the Michigan region are lower than for any other of the SSC regions.

1517.53

Labor availability in the Michigan Region of Influence is considered in the immigrant work force estimates. These estimates are lower for the Michigan region than for any of the other six proposed regions (see EIS Volume I, Chapter 5, Section 5.1.8.1).

1517.54

The diversity and abundance of the construction and industrial base of the Michigan region is reflected in EIS Volume IV, Appendix 5, Section 5.4.11.1.A.

1517.55

The referenced information was reviewed in the preparation of the Final EIS.

1517.56

See Comment Response 275.04. Should Michigan be the selected site, the Michigan property acquisition process designed for the SSC will be analyzed in greater detail and evaluated as part of the Supplemental EIS. While it is possible that portions of the fee simple area may be competitively out leased, and, if this should occur, some of that land would be prime farmland, specific estimates of the amounts of prime farmland available for competitive outleased (and therefore not removed from production) cannot be reasonably projected until more detailed project design is available.

1517.57

The referenced materials were reviewed in the process of revising the EIS.

1517.58

Potential impacts on local public schools are described in Volume IV, Appendix 14, Section 14.1.3.4.C. The EIS analysis projects potential public school enrollment increases for the counties of Ingham and Jackson, and for the Michigan Region of Influence; it does not pinpoint specific school districts where the pupils would be likely to enroll. Although in-migrating construction workers may not settle near the actual site proposed for the SSC location, as the comment contends, their families would still impact local public services (including public schools) wherever in a given county they choose to settle.

EIS text accompanying the table cited in the comment states that the redistribution of revenue from the State government could be used to offset negative impacts associated with SSC development. The degree to which the legislated funds for property tax losses could respond to increased enrollment demand would depend on the actual settlement pattern of the in-migrants. The rate of in-migration and the distribution of these new residents, during both the construction and the operations phases of the project, are further discussed in the EIS Volume IV, Appendix 14, Sections 14.1.3.4.A and 14.1.3.4.B.

1517.59

Comment noted.

1517.60

The figure referred to in the comment has been corrected.

1517.61

The Volume IV, Appendix 1 misspellings listed in the comment have been corrected. However, "Rage" was not changed to "Race" (see Section 1.2.4.5), because the Michigan proposal Map 4 of Figure 2.1-2, both in the original submittal as well as Revision 1, clearly show the name "Rage Road." Since this map has USGS topographic maps as its base, it is presumed correct.

1517.62

Attachments noted and reviewed in the process of revising the EIS.

1517.63

See Comment Responses 1517.163, 1517.164, 1517.165, 1517.166, 1517.167, 1517.168, and 1517.169.

1517.64

See Comment Response 1517.170.

1517.65

Both Table 5.4.8-1 and Figure 5.4.8-1 in EIS Volume IV, Appendix 5 have been revised as suggested.

1517.66

The assumptions for the SSC project are described in Volume I, Chapter 3. Adaptations to the conventional facilities for the Michigan site include reconfiguration of A, B, and C areas, reduction of the size of C area, and movement of F2, F3, F4, and the several J areas (J1-J4)(see Volume I, Chapter 3, Section 3.4.4.). The acreages anticipated to be disturbed by project construction and operations are presented in Volume I, Chapter 3, Table 3-2.

1517.67

The assumptions used in estimating wetland impacts are explained in the revised EIS (see Volume IV, Appendix 11, Section 11.3.4.3). See also Comment Response 1517.17.

1517.68

Wetlands that may be affected by construction of the SSC in Michigan and at all other sites have been uniformly re-evaluated on the basis of post-DEIS surveys conducted at the sites, U.S. Fish and Wildlife National Wetland Inventory Maps, and aerial photographs (see EIS Volume IV, Appendix 11, Section 11.2.2 for wetlands assessment methodologies). These evaluations provide specific information on both quality and quantity of wetlands that could be impacted at each of the sites. The wetland assessment focuses upon those wetlands that could be directly preempted due to construction. Wetlands that are adjacent to proposed facilities (i.e., within 200 feet of proposed facility boundaries) are also discussed in the context of indirect affects (e.g., erosion).

1517.69

The draft EIS wetland data for Michigan was not calculated in a manner that was consistent with that of the other states, and has been corrected. Also, wetlands that may be impacted by construction of the SSC have been reevaluated based on the results of a post-DEIS field surveys conducted at the sites by the DOE, using U.S. Fish and Wildlife Service National Wetland Inventory Maps and aerial photographs (see Volume IV, Appendix 11, Section 11.2.2 for wetlands assessment methodologies). The additional data includes information on both wetland quality and quantity that could be impacted at each of the sites, and the data is readily comparable among States (see the revised EIS Volume IV, Appendix 11, Section 11.3). Discussion has also been included that covers the potential to mitigate wetland impacts through facility realignments

and/or through alternative facility siting choices (i.e., J facility development) (see EIS Volume I, Chapter 3, Section 3.1.6 and Volume IV, Appendix 11, Section 11.3). The latter takes into consideration relative abundance of wetlands in the region from the point of view of feasibility of alternative mitigation measures such as wetland avoidance and replacement.

1517.70

In theory, it could be argued that a "small" number of wetland acres in the fee simple area may suggest a greater (rather than lesser) significance if degraded. The importance of wetlands, where they are a scarce resource, is discussed in the EIS (e.g., Volume IV, Appendix 11, Section 11.3.2.3). Conversely, it could also be argued that for the sites where wetlands are scarce, there is a greater opportunity for mitigation via relocation of the facilities.

All wetlands within fee simple areas would not be impacted. Therefore, a post-DEIS survey and reassessment of wetlands focused upon only the fee simple areas where surface facilities would occur. However, the resiliency of these wetlands cannot be determined at this stage due to uncertainties in the precise location of facilities and/or associated structures and the types of construction and/or erosion control measures to be implemented. Thus, it was necessary to make the assumption that all wetlands encroached by proposed surface facilities would be impacted (see Volume IV, Appendix 11, Section 11.2.2), if no mitigation measures were undertaken.

The statement that the significance of wetlands is directly related to wetland abundance in an area is incorrect because of the special status given to wetlands under the Clean Water Act, the U.S. Fish and Wildlife Coordination Act, and Executive Order 11990 Protection of Wetlands (May 24, 1977). Because of the importance and scarcity of wetlands nationwide, permits are required for compliance with Section 404 of the Clean Water Act whenever wetlands are impacted by proposed developments, regardless of the abundance of wetlands in an area. However, general comparisons of wetland abundance in the vicinity of all SSC locations are provided in the text (see Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3). The wetland assessment presented in the EIS relies on conservative estimates of wetland impacts and wetland impacts are likely to be lower since mitigation measures will be implemented in siting and construction of the SSC. A similar methodology was used for all sites and therefore evaluations should be comparable among sites. A more detailed assessment of the impacts and proposed mitigation to wetlands at the selected site would be provided in the Supplement to the EIS.

1517.71

EIS Volume IV, Appendix 11, Section 11.3.4.3 has been rewritten to incorporate a reevaluation of wetlands occurring in the areas associated with surface facilities for the proposed Michigan site. This has corrected the transposing of acreages occurring in areas B and C.

151715253358812

1517.72

Each of the following figures in Volume IV, Appendix II has been modified to show only the facility location as proposed by the respective states. These figures are II-2, II-5, II-7, II-9, II-16, II-17, II-18, II-32, and II-33.

1517.73

Based on the wetlands evaluation and assessment (see Volume IV, Appendix 11, Section 11.2.2), Table 1-1 has been modified.

1517.74

See Comment Response 1517.17.

1517.75

See Comment Response 1517.135.

1517.76

See Comment Response 1517.11.

1517.77

See Comment Response 1502.16 and 1517.11.

1517.78

The 360- and 260- acre values cited in the text (Volume I, Chapter 5, Section 5.1.5.1.B.4) represent total area of disturbance. This includes wetland and non-wetland areas. The potential impact on wetlands has been reassessed, focusing upon wetland encroachment at sites where surface facilities could be located (see Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.4.3). The maximum potential impact to wetlands from construction of original planned facilities in Michigan is 190 acres. An additional 319 acres of wetlands would be the maximum area impacted by future expansion areas. Methods for determining this value are discussed in Volume IV, Appendix 11, Section 11.2.2. The wetland assessment methodology was uniformly applied to all site alternatives. The potential wetland impacts for all sites is a conservative (worst-case) estimate based on no mitigation. Presenting potential wetland impacts in a conservative manner readily demonstrates which sites could require mitigation and at which specific facilities mitigation would be needed. Potential mitigation is also discussed in the above mentioned sections (also see Volume I, Chapter 3, Section 3.6). If Michigan is the selected site, a more detailed discussion of wetland impacts and mitigation will be provided in the supplement to the EIS.

1517.79

It is DOE policy to avoid wetlands to the maximum extent practicable. Requirements for a 404 permit are consistent with DOE obligations under Executive Order 11990 and DOE's regulations for compliance with floodplain/wetlands environmental review requirements (10 CFR Part 1022). DOE acknowledges that authority for the 404 program in Michigan has been delegated to the Michigan Department of Natural Resources (see Volume IV, Appendix 11, Section 11.3.4.3). If Michigan is selected as the site, DOE would obtain required permits from the State and mitigate wetlands as required.

1517.80

Comment noted.

1517.81

To permit fair comparison among the seven site alternatives, the U.S. Department of Agriculture Farmland Conversion Impact Rating Form AD-1006 was used. On this form the Soil Conservation Service identified the acreages for prime and important farmland in the fee simple project area. After the proposed site is selected, the soils acreage report would be verified and the data used in a site-specific Supplemental EIS.

1517.82

See Comment Response 1517.91.

1517.83

The DOE agrees that secondary impacts to groundwater supplies due to population increases would not be significant. This is because sufficient excess capacity exists within area water supply systems to meet expected growth levels. However, aquifers around Jackson, Lansing and Stockbridge are already in an overdraft condition. The additional water withdrawn to meet SSC-related growth needs would be a small but measurable impact.

1517.84

See Comment Response 1517.91, paragraphs 1 and 4.

1517.85

The comment agrees with EIS Volume IV, Appendix 7, Sections 7.2.3.4.A.1 and 7.2.3.4.A.2.

1517.86

See Comment Response 1517.90.

1517.87

Off-site water use impacts from the SSC construction and operations are comparable as evident from the projected water use, which averages 507 acre-ft per year (about 315 gal/min during the projected seven-year construction period and 490 acre-ft per year (about 305 gal/min) during SSC operations. On-site water use impacts from the SSC construction are expected to be much less during the SSC construction than operations since construction water use is projected to average only 49 acre-ft per year (about 30 gal/min) while operations water use is projected to average 2,175 acre-ft per year (about 1,350 gal/min). The combined on-site and off-site water use is projected to be 556 acre-ft per year (about 345 gal/min) during SSC construction compared to 2,665 acre-ft per year (about 1,655 gal/min) during SSC operations. Thus, the total annual operations water use is about five times the total annual construction water use. Consequently, for the combined on-site and off-site water needs, water supply impacts would be smaller during the construction period than during the SSC operations. The differences in impacts would be noticed mainly by the water sources supplying the on-site rather than off-site water needs. Since essentially the same sources would supply both construction and operations water needs, however, some aspects of the projected impacts were covered under more than one heading in Volume IV, Appendix 7, Sections 7.1.3.4 and 7.2.3.4.

1517.88

As discussed in EIS Volume IV, Appendix 7, Section 7.2.3.4.A.6 some wells may have to be abandoned because of the project. The closure of these wells at their current locations and their replacement in other locations will change the pumping pattern, and thus the local variations in groundwater drawdown. This may affect other existing water wells.

1517.89

This comment concurs with the assessments in Volume IV, Appendix 7, Section 7.2.3.4.

1517.90

The comment concurs with the groundwater quality assessment provided in the EIS (see EIS Volume IV, Appendix 7, Section 7.2.3.4).

Volume IV, Appendix 7, Section 7.2.3.4 states that "no groundwater quality impacts related to construction or continuing operations groundwater use are anticipated."

1517.91

The structure of sections describing impacts in Volume IV, Appendix 7 was intended generally to separate the time periods when different types or levels of impacts would occur. Section 7.2.3.4 emphasizes the Saginaw Formation because for the glacial and Marshall Formation aquifers. There is less information on available groundwater volumes. Character of and

impacts to, these aquifers are addressed in a qualitative manner. Both the DEIS and EIS indicate that SSC-related impacts to local groundwater overdrafts would be greatest near Jackson and Lansing as these communities would likely have the greatest population increases from the project. Some impacts are also likely in the vicinity of Stockbridge. This section also addresses the types of impacts that can occur due to construction of the SSC and the range of mitigating activities that can be considered to reduce those impacts. However, indirect impacts to water resources due to construction and operations are addressed together, since no sharp change in the nature or level of impact is likely to occur.

As defined in EIS Volume IV, Appendix 7, Section 7.2.2 a measurable impact occurs when:

"The amount of change from baseline or existing conditions would result in some decrease in long-term groundwater availability or would require some change in groundwater use or use patterns."

An overdraft condition exists in an aquifer when withdrawals exceed recharge. Conditions affecting overdrafts are discussed in EIS Volume IV, Appendix 7, Section 7.2.2.2.

1517.92

Data were received and reviewed in the preparation of the Final EIS.

1517.93

The information provided in the comment has been reviewed and summarized and incorporated, as appropriate, to revise or update EIS Volume I, Chapter 4, Section 4.2 and Volume IV, Appendix 7, Sections 7.1.3.4 and 7.2.3.4.

1517.94

The information provided in the comment has been reviewed and has been incorporated, where appropriate, to revise or update the EIS (see Volume IV, Appendix 7 and Volume I, Chapter 5, Section 5.1.2).

1517.95

These data have been reviewed and incorporated as appropriate in EIS Volume IV, Appendix 5, Table 5.4.2-1.

1517.96

The information referenced in the comment has been incorporated, as appropriate, in EIS Volume I, Chapter 4, Section 4.2, Volume I, Chapter 5, Section 5.1.2, and Volume IV, Appendix 7.

1517.97

The information provided in the comment has been reviewed and summarized and incorporated, as appropriate, to revise or update EIS Volume I, Chapter 4, Section 4.2 and Volume IV, Appendix 7, Sections 7.1.3.4 and 7.2.3.4.

1517.98

Comments noted.

1517.99

Comments noted.

1517.100

Comments noted.

1517.101

The comments with respect to the Michigan site are generally consistent with the database used to prepare the EIS. However, the data on rock mass permeability and rock mass strength do indicate that much of the tunnel will probably need a pre-cast segmental liner for water control and structural support. The geotechnical and geohydrologic characteristics of the site are described in Volume IV, Appendix 5, Sections 5.4.1 and 5.4.2.2. The conditions you describe at the other sites are discussed in Volume IV, Appendix 5, Sections 5.1.1, 5.2.1, 5.3.1, 5.5.1, 5.6.1, and 5.7.1; none of these are beyond the range of ground conditions that can be accommodated by normal underground engineering practices.

1517.102

Characteristics described as negative for other sites in the comment are much less so when taken in proper context as follows:

a. Dissolution features in the limestone in Tennessee do not extend to tunnel depth and therefore are not an impediment to the tunnel.

b. Faults and shears at the Arizona site do not cross the tunnel; those in North Carolina can be handled with conventional groundwater control practices. Metamorphism and igneous intrusions, as found in Arizona and North Carolina, result in variability of rock types, but this variability is of no more concern to tunneling than the variability of interbedded sandstone and shale in Michigan. The faulting at the Texas site is principally small-scale, and not a particular pathway for water inflow.

c. The substantial head of water above tunnel depth at Illinois and Tennessee is not a particular problem, since the only permeability is from fractures, which are generally tight at tunnel depth. At the Michigan site the rocks have substantial primary permeability

so a water-tight liner will be needed in most of the tunnel. Underground construction in Illinois and Tennessee will be more expensive than cut-and-cover; however, the advantage of cut-and-cover at the Michigan site is partially offset by the need for large-scale water control in the drift, and a cast-in-place thick concrete liner for the halls.

d. A precast segmental tunnel liner is needed to control slaking at the Texas and Colorado sites. However, a similar liner, with the additional expense of water-tight seals, will be needed for much of the Michigan tunnel for groundwater control.

e. Stray rocks, as at the Illinois, Tennessee, and North Carolina sites do result in slower excavation. However, this is largely offset by the fact that these tunnels require no liner and little other support for stability.

1517.103

Information on geological engineering conditions at all proposed sites is found in Volume IV, Appendix 5.

1517.104

The data were received from the Michigan proposers during the preparation of the EIS and included in the database used for the EIS Volume IV, Appendix 5, Section 5.4.1 and Volume IV, Appendix 6.

1517.105

See Comment Response 275.06, paragraph 1 and Comment Response 312.09 for discussion of water-related impacts from construction at the Michigan site.

1517.106

See Comment Response 1517.104.

1517.107

See Comment Response 1517.104.

1517.108

See Comment Response 1517.104.

1517.109

See Comment Response 1517.35.

1517.110

The exact location of the collider ring will be decided after the site is selected. Shifts of 10 to 20 ft in vertical location of the collider ring would not result in significant cost differences at this conceptual level.

1517.111

See Comment Response 1517.104.

1517.112

See Comment Response 1517.104.

1517.113

See Comment Response 1517.104.

1517.114

A description of tunnel spoils is presented in EIS Volume IV, Appendix 6, Section 6.3.4.2 and Appendix 10, Section 10.2.3.4. The glacial material referred to in the comment is discussed in the EIS in Volume I, Chapter 4, Section 4.1.2.

1517.115

This information is consistent with that in Volume IV, Appendix 10, Section 10.2.3.4.A.

1517.116

Information on the Cedar Run Coal Mine Reclamation Project was requested for the DOE Site Task Force site selection activity, but was not requested specifically for the EIS. This information will be needed in the Supplemental EIS if Michigan is the selected site. EIS Volume I, Section 5.1.2.3 and Volume IV, Appendix 7, Section 7.1.3.4 have been modified to include covering of spoils piles as a means of reducing acid leachate.

1517.117

See Comment Response 1517.104.

1517.118

See Comment Response 1517.104.

1517.119

The DOE assumes this is a commitment by the proposing State. In any event, the DOE is committed to comply with the Noise Control Act of 1972 (see Volume I, Chapter 6, Section 6.2.9).

1517.120

See Comment Response 1517.104.

1517.121

See Comment Response 1517.104.

1517.122

See Comment Response 1517.104.

1517.123

See Comment Response 1517.104.

1517.124

Specific calculations of potential inflows or dewatering/inflow control requirements for shaft construction at SSC site alternatives are not presented in the EIS. However, the methodology and estimates for the Michigan site included with the comment are consistent with background calculations performed for EIS preparation.

1517.125

See Comment Response 1517.116.

1517.126

Ambient vibration conditions at the Michigan site will be an important input to detail design but are not an environmental impact issue, because the SSC will not produce vibrations during operations. The concern regarding vibration during SSC operations is the adverse impact that ambient noise and vibration conditions could have on SSC experiments. No information presented by the Michigan site proposer group indicates that conditions will exceed the criteria delineated in the Invitation for Site Proposals (see EIS Volume I, Chapter 4, Section 4.5).

1517.127

The EIS has been corrected in Volume IV, Appendix 11 and Volume I, Chapter 5, Section 5.5 to reflect the comment.

1517.128

See Comment Response 1517.09.

1517.129

See Comment Response 10.03.

1517.130

Comments noted.

1517.131

See Comment Responses 10.03 and 1517.136.

1517.132

The text of EIS Volume I, Chapter 3, Section 3.7.7 and Table 3-7; Volume I, Chapter 5, Section 5.4; Volume IV, Appendix 5, Table 5.4.9-5; and Volume IV, Appendix 11, Section 11.3.4.3 has been modified to remove these inconsistencies.

1517.133

A discussion of wetlands appears in Volume IV, Appendix 11. The conclusions offered are consistent with the wetlands assessment in this EIS.

1517.134

See Comment Response 1517.09.

1517.135

Wetland impacts analyses for all sites have been reevaluated. Wetlands occurring in areas associated with surface facilities for the proposed project site in Michigan were identified and assessed by the DOE and reevaluated on the basis of field surveys, U.S. Fish and Wildlife Service National Wetlands Inventory Maps, and aerial photographs. Methodologies utilized for the wetlands assessment are discussed in EIS Volume IV, Appendix 11, Section 11.2.2. The DOE has determined that there are approximately 567 acres of wetlands located in the fee simple properties where surface facilities could be located (see EIS Volume IV, Appendix 11, Section 11.3.4.3). Wetlands also occur in other portions of the fee simple properties. However, because no construction (and thus no wetlands impact) is planned in these additional areas, these wetlands were not assessed.

1517.136

The authority granted the State of Michigan is acknowledged (see Volume IV, Appendix 11, Section 11.3.4.3). The goals and requirements of Michigan's wetland protection program are similar to the Federal program for Section 404 of the Clean Water Act.

Based upon a post-DEIS wetlands evaluation and assessment, the texts and tables have been modified to incorporate a reevaluation of wetlands data (see EIS Volume I, Chapter 1, Table 1-1; Chapter 3, Sections 3.4.4 and 3.7.7; Chapter 4, Section 4.7.1; Chapter 5, Sections 5.1.5.4, 5.2.7, 5.4, 5.6.4.4, and Table 5.6-4; Chapter 6, Table 6-2; and Volume IV, Appendix 11, Sections 11.3.4 and 11.3.4.3. Table 5.4.9-5 of Volume IV, Appendix 5b has been deleted).

1517.137

See Comment Response 10.03. The Soil Conservation Service identified 4,002 acres of prime farmland and 2,658 acres of important farmland in the SSC fee simple area. From these inventories, an estimated 341 acres of prime and important farmland would be permanently converted by the project at the proposed Michigan site. See Volume I, Chapter 3, Section 3.7.11; Chapter 4, Section 4.8.6; Chapter 5, Section 5.1.7.2; and the Errata for Volume IV, Appendix 13.

1517.138

See revised discussion in Appendix 11 for clarifications.

1517.139

Comment noted. See Comment Responses 1322.96, 1322.98, and 1322.108.

1517.140

It is recognized that groundwater and surface water supplies in the area around the proposed SSC site are extensive, with only localized overdrafts occurring near the major population centers of Lansing and Jackson. Detail information on water availability is presented in EIS Volume I, Chapters 4.2.1 and 4.2.2 and Volume IV, Appendix 5, Section 5.4.2. Where appropriate, additional data provided by the State of Michigan on water availability and water use has been incorporated in these sections. See also Comment Response 1517.19.

1517.141

See Comment Response 1517.45.

1517.142

See Comment Responses 277.02 and 277.03.

1517.143

Revisions have been made to EIS Volume IV, Appendix 7, Section 7.2.3.4 and Appendix 10, Section 10.2.3.4 identifying the additional mitigating measure (sealing spoils piles to prevent oxidation) proposed by the State to reduce the potential for acid leachate development. See Comment Response 1517.162.

1517.144

The comment addresses surface water quality in project vicinity (see Volume IV, Appendix 5, Table 5.4.2-3). See Comment Responses 1517.163, 1517.164, 1517.165, 1517.166, 1517.167, 1517.168 and 1517.169.

1517.145

Wetlands that may be affected by construction of the SSC at all sites have been uniformly reevaluated on the basis of field surveys conducted by DOE at the sites, U.S. Fish and Wildlife National Wetland Inventory Maps, and aerial photographs (see Volume IV, Appendix 11, Section 11.2.2 for wetlands assessment methodologies). These evaluations provided specific information on both wetland quality and quantity that could be impacted at each of the sites.

Based on this reevaluation, the staff has identified approximately 567 acres of wetlands in the areas associated with surface facilities for the proposed Michigan location. This and other information from the Michigan wetlands reevaluation has been incorporated into Volume I, Chapter 1, Table 1-1; Volume I, Chapter 5, Section 5.1.5.3; and Volume IV, Appendix 11, Section 11.3.4.3.

Mitigation for wetlands impacts (such as relocation of surface facilities) would reduce the impacts of SSC construction (see Volume I, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.4.3). Detailed plans to mitigate any impacts to wetlands from construction and operation of the SSC at the selected site would be presented in the site-specific supplement to the EIS.

Concerning the delegated authority of the State of Michigan, see the response to comment 1517.014.

1517.146

See Comment Responses 1322.96, 1322.98, and 1322.108.

1517.147

The source of values for Michigan air quality (EIS Volume I, Chapter 4, Section 4.4.2 Table 4-6) was given in footnote No. 5. The values listed in Table 5.5-1 of the Michigan proposal were extrapolated from Detroit and Lansing values with consideration given to the distance from the proposed Stockbridge site. While they may be excellent estimates of

existing conditions, the DOE took the position for this EIS that ambient air values must be actual measured values.

The high values of total suspended particulate (TSP) and carbon monoxide (CO) in the DEIS could be misleading. In revisions centered on TSP, any potential Michigan problem has been handled by mitigation steps that should keep the TSP values below the AAQS (see Comment Response 1278.11).

The potential for misunderstanding of the CO data was reduced or eliminated by qualifying statements in tables and text (see Comment Responses 1322.96 and 1322.108).

1517.148

The DOE defines an overdraft condition as one where long-term water withdrawal from an aquifer exceeds recharge in a definable area. The significance of SSC impacts on current overdraft conditions is discussed in EIS Volume IV, Appendix 7, Section 7.2.3.4. See also Comment Responses 312.04 and 1517.83.

1517.149

While it is recognized that projects deemed to be for the public good enjoy the highest legal status in any water use conflicts, it is the DOE's position that the potential for those conflicts to arise should be minimized to the extent possible. EIS Volume IV, Appendix 7, Sections 7.2.2 and 7.2.3.4 discuss approaches that might be taken to mitigate impacts to water supplies due to construction of the SSC.

1517.150

Data provided in the comment has been reviewed, summarized and has been incorporated, as appropriate, in EIS Volume I, Chapter 4, Section 4.2 and Volume IV, Appendix 7, Section 7.2.3.4.

1517.151

The data supplied have been incorporated into the EIS. See Comment Response 312.04.

1517.152

This information has been incorporated in the EIS Volume IV, Appendix 7, Section 7.1.3.4 to better demonstrate the availability of surface water as a possible alternative water supply source.

1517.153

The assessment of overdraft/water level impacts from SSC direct and indirect water use is discussed in detail in EIS Volume IV, Appendix 7, Section 7.2.3.4. An increment to existing overdraft is assumed based on the occurrence of areal water level declines. No significant future water quantity or water quality problems are assumed.

151715253358824

1517.154

See Comment Response 1517.45.

1517.155

See Comment Response 1517.45.

1517.156

Potential impacts on sensitive species, habitats, or individual plants would depend on final design considerations for and placement of specific facilities, and would be evaluated prior to construction phases. These issues are addressed in many places: in the introduction of the EIS Section 11.3.5 of Appendix 11, in Subsections 11.3.5.1 and 11.3.5.3.C for wetland habitats, and at the end of Section 5.5.9.5.A of Appendix 5. Surveys would be initiated if Michigan is selected for further investigation. If sensitive species such as the state champion hickory are present and could be affected by the SSC, formal consultation with the U.S. Fish and Wildlife Service and with State agencies regarding sensitive species and habitats will continue through site investigation and design phases (see Appendix 11, Section 11.3.5.2), in compliance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543). Measures to avoid or reduce adverse impacts would be applied in consultation with State agencies. The Supplemental EIS would report the results of the additional surveys and consultations.

1517.157

Anticipated impacts on the sensitive habitats listed in the comment are presented in EIS Volume IV, Appendix 11.

1517.158

See Appendix 6 for additional discussions of hydrocarbons in the Michigan SSC region.

1517.159

See Comment Response 1517.104.

1517.160

See Comment Response 1517.104.

1517.161

The information provided in Table 10.2.3-4, Volume IV, Appendix 10 of the DEIS is correct. The 3-4 percent pyrite in spoils mentioned was provided to the DOE by the State of Michigan. Please refer to page 2-110 (SSC/D 5664/D1), "Attachment 2, Site Specific Supplementary Data, Submitted to United States Department of Energy dated March 15, 1988." Quote, "Approximately 95 percent of the spoil will consist of inert

materials that would have no potential for groundwater contamination. The remaining 5 percent of the spoil may contain shale consisting of 3 to 4 percent pyrite."

In regards to the laboratory analysis: Table 10.2.3-4 presents the composition of spoil as provided by the State of Michigan and not the leachate analysis. Please note that leachate analysis is not provided for any of the seven states. The leachate analysis could be provided in the Supplemental EIS at a later date after the site is selected.

1517.162

The comment regarding leachate tests related to reactive sulfides in the tunnel spoils is noted. A description of tunnel spoils is presented in Volume IV, Appendix 6, Section 6.3.4.2 and Volume IV, Appendix 10, Section 10.2.3.4.

1517.163

The dissolved oxygen value presented in EIS Volume I, Chapter 4, Table 4-2 has been changed.

1517.164

Fecal coliform standard is shown in EIS Volume IV, Appendix 5, Section 5.4.2.1 and Table 5.4.2-3. No changes have been made to the table.

1517.165

Comment noted regarding dissolved oxygen value shown in Table 5.4.2-3 in Volume IV, Appendix 5, Section 5.4.2.1.B of the DEIS. Values have been corrected in the Errata.

1517.166

Comment noted.

1517.167

The comment regarding chloride standard presented in "Surface Water Quality Data In Project Vicinity" table (EIS Volume IV, Appendix 5, Section 5.4.2.1.B, Table 5.4.2-3) is incorporated in the table and has been corrected in the Errata.

1517.168

The Surface Water Quality Data In Project Vicinity in EIS Volume IV, Appendix 5, Section 5.4.2.1.B, Table 5.4.2-3, has been corrected in the Errata.

1517.169

The comment regarding the mercury standard value presented in the table entitled "Surface Water Quality Data in Project Vicinity". EIS Volume IV, Appendix 5, Section 5.4.2.1.B has been noted and the table changed.

1517.170

The comment regarding mercury and fecal coliform occasional exceedances noted in Volume IV, Appendix 5, Section 5.4.2.1.B is noted. If the Michigan site is selected current concentrations levels will be discussed in the Supplemental EIS. The text will be changed to reflect changes made to mercury standard values. See Comment Response 1517.169.

1517.171

Changes to EIS Volume IV, Appendix 5, Table 5.4.8-1 and Figure 5.4.8-1 have been made as suggested.

1517.172

In response to a request by the DOE for verification of the data used in the EIS, Mr. M. Bray of Michigan's Department of Natural Resources Surface Water Quality Division (Lansing District Office), in a letter dated June 8, 1988, corrected the capacity of Springport Sewage Treatment Plant from 0.11 million gal/d to 0.17 million gal/d. He also corrected the excess capacity from 0.056 million gal/d to 0.116 million gal/d.

1517.173

See Comment Response 1517.171 for the newly added plants (i.e., Delhi Township Treatment Plant and Webberville Wastewater Sewage Lagoon).

The comment about moving the indicated locations of Leslie and Ypsilanti facilities on Figure 5.4.8-1 is accurate and the corrections have been made as suggested.

1517.174

These procedures and data submitted were thoroughly reviewed during the preparation of the EIS.

1517.175

Comments noted.

1517.176

Comments noted.

1517.177

Comments noted.

1517.178

Comments noted.

1517.179

Comments noted.

1517.180

Comments noted.

1517.181

Comments noted.

1517.182

Comments noted.

1517.183

Comments noted.

1517.184

Comments noted.

1517.185

Comments noted.

1517.186

Comments noted.

1517.187

Comments noted.

1517.188

Comments noted.

1517.189

Comments noted.

151715253358828

1517.190

Comments noted.

1517.191

Comments noted.

1517.192

Comments noted.

1517.193

Comments noted.

1518.01

Comments noted.

1519.01

Comment noted.

1520.01

Comment noted.

1520.02

See Comment Responses 274.3, 1517.17, and 1520.08.

1520.03

See Comment Response 1417.05.

1520.04

All of the proposers stated that they will as a minimum comply fully with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646). The Federal act sets minimum standards of assistance and compensation for relocation; advisory and financial assistance for individuals, businesses, or farm operations that must be relocated as a result of the public acquisition of real property; and basic standards and requirements for appraisal and acquisition to be followed in acquiring real property.

For those real property owners whose land or a portion of their land is not acquired in fee simple, as in the case of the SSC stratified fee beneath the land surface, there is no Federal requirement or authorization to provide mitigation. Local economic and population growth resulting from SSC-related development may exert a positive influence or

could tend to depress land values in the area of the SSC facility depending on the local real estate market situation and peoples' perceptions and attitudes. Whether land value effects will prove to be permanent or transitory may depend in large measure on the stability of these conditions and perceptions over time. Careful planning can minimize many negative conditions associated with growth that may also contribute to the perceptions of land value. For a discussion of the environmental safety and health implications of the SSC see Comment Response 810.05.

Questions concerning the proposer's authority to mitigate should be directed to the appropriate State agency.

Changes in land use are discussed in EIS Volume I, Chapter 5, Section 5.1.7.1 and Volume IV, Appendix 13, Section 13.1.3.4. Limitations or restrictions on hunting which would result from SSC construction and operations have not been determined. Such limitations could reduce the amount of recreational hunting, fishing, and commercial trapping in some areas, particularly those immediately adjacent to facility concentrations. It is unlikely that animal populations would suffer any substantial loss from a decrease in habitat due to the abundance of high quality habitat in the vicinity (EIS Volume IV, Appendix 11, Section 11.3.4.4).

1520.05

The page referred to by the commenter is a figure. Nevertheless, the text of the DEIS does not state or imply that the Michigan Department of Natural Resources (MDNR) has preauthorized wetlands permits. The MDNR is, however, the designated authority for the U.S. Army Corps of Engineers in Michigan, and is responsible for wetlands permitting in the State. A post-DEIS wetlands survey has reevaluated wetlands, and identified approximately 190 acres of wetlands in Michigan that could be impacted from surface facility construction (see EIS Volume IV, Appendix 11, Section 11.3.4.3). If Michigan is selected, specific mitigation plans would be developed in consultation with the MDNR as required by Section 404 of the Clean Water Act, and the DOE would comply with all applicable Federal and state statutes. Detailed mitigation plans would be included in a site-specific Supplemental EIS. See also Comment Response 1517.17.

1520.06

Although wetlands are abundant in the Michigan project area, the proposed siting of the SSC would avoid many of these wetland areas. Estimates of wetland impact are based on the amount of wetland habitat that occurs within the boundaries of surface facilities. These facilities would be relocated wherever practical to avoid wetlands impacts in accordance with DOE policy. Also see Comment Response 1517.17.

1520.07

EIS Volume I, Chapter 5, Section 5.4 summarizes the unavoidable adverse impacts associated with SSC project development. Impacts to recreational resources are discussed in the revised Volume IV, Appendix 11, Section 11.3.3.4. Hunting and fishing will be restricted as a result of controlled access fee simple areas. This is not expected to result in a significant loss of use and enjoyment of recreational resources. Personal property values may or may not decline as a result of SSC project development depending on local economic and population growth.

Development implications at both the project and regional levels are provided in Volume IV, Appendix 13, Sections 13.1.3.4.C and 13.1.4.D, respectively. The analyses indicate that Stockbridge, Mason and Leslie will experience growth. Other communities cited in the comment may also experience some SSC-related growth, but in a more diffused manner.

1520.08

EIS Volume IV, Appendix II, Section 11.3.4.2 states that many of the species of plants listed by the State of Michigan are associated with wetlands, and over 25 species of plants of the 200 suggested by the commenter have been listed in the EIS as potentially present in the vicinity of the proposed Michigan site. If the Michigan site is selected for the SSC, additional site-specific surveys would be conducted to determine whether any protected species are present and could be adversely affected by project development. Information from the surveys would be used in the avoidance of sensitive areas, including valuable wetlands.

Regarding the omission of the listing of the plant Platanthera ciliaris as a C-1 candidate species, all candidate species potentially present at the site have been discussed in EIS Volume IV, Appendix II, Section 11.3.4.2. Platanthera ciliaris is not potentially present at the proposed site.

1520.09

The SSC will require the construction of power transmission and distribution lines. Lines to be built if the Michigan site is selected consist of one 345-kV line and one 138-kV line (EIS Volume IV, Appendix 1, Section 1.2.4.10). The concern about electromagnetic field effects on wildlife is not directly addressed in the EIS because no impacts are anticipated. However, some research has been conducted on the effects of electric and magnetic fields on animals. A recently conducted review of field and laboratory studies dealing with these concerns concluded that minimal or no impacts are associated with electric field strengths of 30 kV/m (U.S. DOE 1987). Fields of 30 kV/m are generally associated with transmission lines that have voltages greater than 345 kV. For example, the fields within the right-of-way under 345 kV lines in New England are estimated to be 6 to 7 kV/m (U.S. DOE, 1987). Thus, fields of 30 kV/m or less would be those expected to occur if the SSC is built

in Michigan. The conclusion from the research conducted to date, which has often involved observations of animals exposed continuously to electromagnetic fields, is that wildlife or other animals such as sandhill cranes exposed only intermittently to field strengths comparable to those anticipated for the SSC, would not experience adverse impacts.

Magnetic fields from the superconducting magnets will not be detectable or measurable at the surface above the tunnel (see EIS Volume IV, Appendix 12).

1520.10

See Comment Response 1478.09.

1520.11

Baseline studies will be conducted prior to commencement of the SSC construction to establish a more site-specific database for existing environmental conditions, including groundwater levels and quality, and wildlife and wetland conditions. During SSC construction and operations, environmental monitoring will be conducted to obtain a continuous record of potential impacts of the project. The details of the monitoring program will be formulated as part of the final design and documented in the Supplemental EIS for the selected site.

1520.12

If Michigan is selected as the SSC site, more detailed baseline studies of wildlife and wetlands would be conducted. This assessment would be presented in the Supplemental EIS.

1521.01

Comment noted.

1523.01

See Comment Responses 864.01, 1279.02 and 1391.06.

1523.02

See Comment Response 1276.01.

1523.03

See the second paragraph of Comment Response 864.01.

1524.01

Comment noted.

1524.02

See Comment Response 1195.06.

1524.03

See Comment Response 533.03.

1524.04

See Comment Response 1312.01.

The EIS in Volume IV, Appendix 14, Section 14.2.1.3 C.1 presents an analysis of existing traffic conditions and projected traffic conditions during construction and operations. Data on the capacity and current traffic volume on Illinois site roads were obtained from the Illinois Department of Transportation and were not verified by the DOE. The DOE projected SSC related traffic based on the distribution of work locations and the forecasted distribution of population impacts. The level of service on existing roads and the projected future level of service during construction and operations on site roads was analyzed by the DOE using Transportation Research Board and Illinois Department of Transportation methodologies. The traffic analyses performed in the EIS represents a reasonably accurate picture of conditions likely to occur if the Illinois site is selected for the SSC. More detailed traffic analyses will be performed in the Supplemental EIS for the selected site.

1524.05

Comment Noted.

1525.01

See Comment Response 996.01.

1526.01

Comment noted.

1526.02

Minority business resources are included in the employment and labor force estimates presented in the affected environment sections of the EIS. For the Texas region, see EIS Volume IV, Appendix 5, Section 5.7.11.1.A. Use of minority owned business for land acquisition should be addressed to the appropriate land acquisition authority. Design metholodogy will be evaluated in the Supplemental EIS.

1526.03

See Comment Response 1526.02.

1527.01

Comment noted.

1527.02

SSC-related effects on the quality of life in local communities will depend on the settlement patterns of SSC-related workers and on the ability of local communities to respond to the growth effects. The capacity of communities to adapt to growth varies with the ability of the community to plan and finance needed facilities and services and by their past experience with development. Many of the negative conditions associated with rapid growth can be minimized through careful planning.

The net public finance and infrastructure impacts to local governments would vary, in part, from differing tax rates, from differing levels of SSC-related population effects, and from the amount of private land transferred to Federal ownership. The public finance, quality of life, and transportation impacts of the SSC are presented in EIS Volume I, Chapter 5, Sections 5.1.8.4 to 5.1.8.6. Questions concerning strategies and committments by the State to mitigate local city and county infrastructure impacts should be directed to the appropriate State agency.

1527.03

See Comment Response 1467.04.

1527.04

See Comment Response 880.04.

1527.05

The mitigation measures have been modified to ensure the estimates of particulate (dust) matter will be in compliance with ambient air quality

standards. EIS Volume I, Chapter 5, Section 5.1.3, Table 5.1.3-1 and Volume IV, Appendix 8, Section 8.4.7, Table 8-59 show that all the dust from SSC construction will add 3.1 percent to what the EPA estimates is currently being emitted in Ellis County. See also Comment Response 1278.11.

1527.06

Comment noted.

1544.01

It is DOE policy to conform with all applicable Federal and State regulatory statutes and regulations. (See EIS Volume I, Chapter 6.) In this respect, all of the proposed sites are "Federally safe for use."

Fermilab will continue to operate in its current mode regardless of whether the Illinois site is selected for the SSC. See EIS Volume I, Chapter 3, Section 3.3. Relocation of staff physicists and their families would not be necessary.

The State of Illinois has proposed the use of Fermilab facilities for the SSC. See EIS Volume IV, Chapter 3, Section 3.4.3.

1545.01

Comment noted.

1546.01

Comment noted.

1547.01

Comment noted.

1547.02

Comment noted.

1547.03

The text of EIS Volume IV, Appendix 5, Section 5.7.1.2 has been corrected in the Errata as suggested.

1547.04

"Woodbine" has been capitalized in the Errata for Appendix 5 as suggested.

1547.05

According to the USGS description, the gauge on Waxahachie Creek near Bardwell is located 0.8 mi downstream of Bardwell Dam and 4.1 mi upstream from the mouth of Waxahachie Creek where it joins Chambers Creek (Buckner, et al., 1987). This would indicate that the confluence of Waxahachie Creek and Chambers Creek is indeed 4.9 mi downstream of Bardwell Dam. The text in EIS Volume IV, Appendix 5, Section 5.7.2.1.A has been changed to show the correct mileage figure.

1547.06

Figure 5.7.2-1 in EIS Volume IV, Appendix 5 has been changed in response to the comment.

1547.07

Figure 5.7.2-2 in EIS Volume IV, Appendix 5, has been corrected in the Errata and Revisions. Also see Comment Response 1547.08.

1547.08

As stated in EIS Volume IV, Appendix 7, Section 7.1.2.1.C floodplain impacts were assessed for a 100-yr flood event according to flood boundaries shown on Federal Emergency Management Administration (FEMA) Flood Insurance Rate Maps. Any reference pertaining to floodplains in the EIS is made with regard to 100-yr flood widths as designated by the FEMA rate maps. References are made to the FEMA maps in the discussion of "flooding widths" in Volume IV, Appendix 5, Section 5.7.2.1.A, and in the same section.

1547.09

A review of the source cited in the description of Lake Waxahachie in EIS Volume IV, Appendix 5, Section 5.7.2.1.A (Dowell and Petty 1973), indicates that flood control is not one of the lake's intended purposes. Additionally, recreational use designations for both Bardwell Reservoir and Lake Waxahachie are included in the Texas Surface Water Quality Standards (Texas Water Commission 1986). The text in Section 5.7.2.1.A has been corrected in the Errata accordingly.

1547.10

Representative stream gauge data are provided for the purposes of general comparisons between the site alternatives (Volume IV, Appendix 5, Table 5.7.2-2). While the data in the table are of differing record lengths and would not allow a statistical comparison, they serve the intended purpose of this section of the EIS (Volume IV, Appendix 5, Section 5.7.2.1.A).

1547.11

Volume IV, Appendix 5, Section 5.7.2.1.B was revised to indicate that the Texas Water Commission adopted new Supplemental Surface Water Quality Standards as of April 1988.

1547.12

Volume IV, Appendix 5, Section 5.7.2.1.B was revised by inserting the general policy statement included in the 1988 Supplemental Surface Water Quality Standards adopted by the Texas Water Commission.

1547.13

Change has been made to Volume IV Appendix 5, Section 5.7.2.1.B to include the new number of segments. See comment Response 1547.11.

1547.14

See Comment Response 1547.11.

1547.15

The validity of the statement in Appendix 5, Section 5.7.2.1.B, that the water quality in Lake Waxahachie should be similar to that in Waxahachie Creek would depend on the relative contributions of the total flow from natural runoff and treated wastewater effluent. At this time, there are no data to support this statement; therefore, the statement has been removed from the text. More in-depth analyses will be conducted for the selected site in the Supplemental EIS.

1547.16

EIS Volume IV, Appendix 5, Section 5.7.2 is used as a standard format in the water quality discussions for each site alternative. In most cases, the states have set standards for instantaneous, not-to-exceed limits that would be comparable to measured instantaneous values. The fact that the Texas standards are annual averages was overlooked in the discussion in Section 5.7.2.1.B. The text in this section has been corrected in the Errata and the table footnoted to indicate that comparisons of Texas standards with the values listed is not strictly valid. The format of the tables is retained to maintain consistent treatment of each site alternative.

1547.17

Table 5.7.2-3 in Volume IV, Appendix 5, Section 5.7.2.1.B has been corrected in the Errata to show that Waxahachie Creek near Waxahachie is an unclassified segment for which only the standards for fecal coliform and dissolved oxygen apply.

1547.18

Table 5.7.2-3 in Volume IV, Appendix 5c, Section 5.7.2.1.B was revised to indicate the new chloride and sulfate standards for Segment 814.

1547.19

The existing Fort Worth Village Creek, TRA Central, and TRA Ten Mile sewage treatment plants as marked in the comment letter are shown on a revised Figure 5.7.8-1.

1547.20

The comment is correct and the Southeast Landfill is now shown on Figure 5.7.8-2 as marked.

1547.21

Figure 5.7.9-1 has been revised.

1547.22

Volume IV, Appendix 5, Section 5.7.9.6.D has been corrected. Hydrological uses of both lakes are cited with appropriate references in Section 5.7.2.1.A.

1547.23

These types of typographical errata are not being corrected in the DEIS.

1547.24

The reference in Volume IV, Appendix 5 has been corrected in the Errata, as indicated.

1547.25

See Comment Response 1547.07.

1547.26

It should be recognized that the proposed layout of the SSC is based on a generic conceptual design provided in the Invitation for Site Proposal (DOE/ER-0315). The locations, dimensions, and layouts for facilities and areas will be reevaluated after a site is selected (Volume I, Chapter 3). Facilities proposed in floodplains will be relocated if design criteria allow the flexibility (Volume IV, Appendix 7, Section 7.1.2.1.C). Floodplain impact also can be mitigated by relocation of the J4 area out of the Chambers Creek Floodplain.

1547.27

The surface water yields and excess capacities available for the proposed Texas SSC, as treated in EIS Volume IV, Appendix 7, Section 7.1.3.7.G, have been corrected and are now consistent with the values in the discussion in Volume IV, Appendix 5, Section 5.7.2.1.C

1547.28

The sentence in Appendix 7, Section 7.2.3.7 stating that locations of potential ground water development are identified in Figure 7-11 has been removed from the text.

1547.29

The EIS Volume IV, Appendix 7, Section 7.2.3.7 has been revised to indicate (1) that surface water sources will supply the campus and near cluster areas for the SSC construction, (2) the relative reliance on surface and groundwater sources for off-site and on-site water use during the SSC operations, (3) the magnitude of SSC operational water needs relative to total groundwater use in Dallas, Ellis and Tarrant Counties, and (4) the relative reliance on surface and groundwater sources for municipal supplies in these three counties.

1547.30

See Commemt Response 1547.29.

1547.31

Volume IV, Appendix 7, Section 7.2.3.7.A.1 was revised to state that the 1984 Texas Water Plan suggests that it is safe to continue overdrafting the Trinity Group, which includes the Twin Mountains aquifer, through 2030.

1547.32

See Comment Responses 401.01 and 1547.29.

1547.33

The text of EIS Volume IV, Appendix 7, Section 7.2.3.7.A.6 has been corrected as suggested.

1547.34

The EIS states that impacts to water users resulting from well closures could be partially mitigated by replacement of wells or connection to alternative water supplies of equal or better quality (Volume IV, Appendix 7, Section 7.2.3.7.A.6 and Volume I, Chapter 3, Section 3.6). It is assumed that no matter how completely these mitigative measures were carried out, there would be some unavoidable, minor disruption to the affected water users.

15261550335886

1547.35

See Comment Response 1318.06.

1547.36

Volume I, Chapter 4, Section 4.2.1, Table 4-2 has been revised to indicate that comparison of instantaneous observations with annual average standards is not valid.

1547.37

Volume I, Chapter 4, Table 4-3 has been revised in accordance with the comment.

1547.38

See Comment Response 1547.07.

1547.39

This specific change is unneccessary as the EIS already states that the major supply of direct SSC water needs at the Texas site will come from surface supplies, with a minor contribution of groundwater at remote facilities (see Volume I, Chapter 5.1.2.4, page 5.1.2-27).

1547.40

Volume I, Chapter 5, Section 5.1.2.4 has been revised as suggested to indicate the relative magnitude of surface and groundwater use by the project and by current users in the vicinity of the proposed Texas site. However, because the SSC will add a demand (albeit small) to an already overdrafted situation in the Twin Mountain and Woodbine aquifers, the impact is still considered measurable. See also Comment Response

1547.41

Because of the already existing overdraft, the incremental groundwater use from the SSC project at the proposed Texas site is small, compared to current groundwater use. Its impact on the existing groundwater overdraft is not considered negligible. See also Comment Responses 1318.09 and 1547.40.

1547.42

See Comment Response 1547.06.

1547.43

See Comment Response 1547.16.

1547.44

Comment noted. EIS Volume IV, Appendix 5, Figure 5.7.8.2 is corrected.

1547.45

Approximately 32 acres of wetlands are located within the proposed boundaries of J4 (see EIS Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.7.3 and Figure 11-38). It is estimated that as much as 20 acres of wetlands could be affected by construction of surface facilities at this site. Because of the ecological importance of Chambers Creek and its floodplain, construction within it would be expected to have significant impacts. See also Comment Response 403.03.

1547.46

EIS Volume IV, Appendix 11, Section 11.3.7.2 states that the nearest potential nesting habitat for the black-capped vireo occurs along the White Rock Escarpment, 2 to 3 mi west of a line parallel to the outer edge of area I. However, the nearest confirmed nesting of the species is in Dallas County 10 to 15 mi north of the proposed SSC site. A recent survey conducted by the Texas Parks and Wildlife Department and cited in the EIS failed to locate preferred nesting habitat for the black-capped vireo within the site area. Although it is unlikely that the species is present on the site, if the Texas site is selected, additional surveys for the vireo would be conducted and would be reported in the Supplemental EIS. If it is determined that the black-capped vireo is present and could be adversely affected by project development, the DOE would begin formal consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act.

1547.47

Comment Noted.

1547.48

A number of alternatives do exist for mitigating possible construction at the J4 Chambers Creek location. These are discussed in Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.5.3, and also Volume IV, Appendix 11, Section 11.3.7.3. Specific information relative to wetland mitigation would be included in the Supplemental EIS for the selected site.

1547.49

Comment noteo.

1547.50

See Comment Responses 874.01, 880.04, and 710.01.

15261550335888

1547.51

The Texas proposal, Volume 4, page 7 lists 211 mi of existing roads which would be upgraded. This figure conflicts with other information in the Texas proposal. In proposal Volume 4, Figure 4.2.2.1-1, only approximately 23 mi of roads to be upgraded are shown. Also, Appendix B to the Texas proposal lists approximately 23 mi. However, a figure of 22 mi was used in the EIS (based on measurement of roads from USGS topographic quad maps).

1547.52

Information recently received indicates that there is no Red Oak treatment plant. Therefore, blowdown water at F3 will be treated similar to blowdown water at the other service area (F) sites. Volume IV, Appendix 1, Section 1.2.7.12 has been changed accordingly.

Also, see Comment Response 35.04.

1547.53

See Comment Response 402.01.

1547.54

See Comment Response 1318.09.

1547.55

See Comment Response 1547.07.

1547.56

EIS Volume I, Chapter 5, Section 5.2.12.7 acknowledges that many new construction projects are planned for the region, mostly concentrated in the Dallas-Forth Worth metropolitan area. The comment concerning the delay in the construction of the DART rail system is noted. The above referenced section has been revised accordingly. The DART system is discussed in greater detail in Volume IV, Appendix 5, Section 5.7.11.2.

1547.57

Items proposed by Texas to be paid for by Texas, such as road construction, were accounted for in the cost estimate. Unspecified items to be covered by the $1 billion authorized by the State of Texas were not covered in the cost estimate. This was in conformance to legislation which Congress enacted to prohibit the DOE from considering financial incentives in the selection of a site for the SSC (see Volume III, Chapter 1, Section 1.1).

1547.58

The location of the Ellis County Disposal Company Landfill was incorrectly indicated as Ellis, Texas instead of Ennis, Texas. Correction has been made to Volume IV, Appendix 5, Section 5.7.8.3 in the Errata.

1547.59

EIS Volume IV, Appendix 10, Section 10.2.3.7.A provides a breakdown of the sources of excavated material and their volume. Eighty-six percent of the total comes from the tunnels and shafts which were calculated as follows:

Sectors:	216,528 LF x	8 CY/LF =	1,732,000 CY
Connectors:	48,884 LF x	8 CY/LF =	391,000 CY
20′ dia shafts:	1,488 LF x	25 CY/LF =	37,000 CY
30′ dia shafts:	1,557 LF x	50 CY/LF =	78,000 CY
			Σ2,238,000 CY

2,600,000 CY number is consistent with data provided in the conceptual design report and the Texas proposal profile. 3,800,000 CY figure cannot be verified.

1547.60

Volume IV, Appendix 10, Table 10.2.3-9 lists options proposed by the State of Texas and does not give all the details. The table presents four options proposed by the State: (1) Austin chalk to TXI Cement Plant, (2) Austin chalk for construction, (3) marl as fill in quarries, and (4) marl to landfills. For details, please refer to Section 10.2.3.7.A.1 through 4. Also, in Volume IV, Appendix 10, Section 10.2.3.7.A.1, the figure (1,800,000 yd^3) from the first sentence has been corrected in the Errata.

1547.61

The wastewater treatment method originally proposed by the State of Texas in its proposal was used in the EIS to present a reasonable scenario for the evaluation of environmental impacts. If the Texas site is selected, the details of the treatment system will be developed during detail design and will be addressed further in the Supplemental EIS.

1547.62

See Comment Response 1547.61.

1547.63

See the third paragraph of Comment Response 1318.43.

1547.64

This comment is consistent with the Attachment 6 comments referenced in Comment Response 1318.43.

1547.65

See the ninth and the last paragraphs of Comment Response 1318.43.

1547.66

See the ninth through the thirteenth paragraphs of Comment Response 1318.43.

1547.67

The comment provides a portion of the text of EIS Volume IV, Appendix 14, Section 14.2.2.3.G.2. No revisions have been suggested by the comments for this section.

1547.68

Comment noted.

1547.69

These observations support the socioeconomic methodology employed in the EIS Volume IV, Appendix 14. The socioeconomic impact methodology used in the EIS analysis is described in Volume IV, Appendix 14, Section 14.1.2.3.B. Additional details of major portions of this methodology are contained in the key source cited in this section.

1547.70

This observation is consistent with Volume IV, Appendix 14. More in-depth analysis of public finance trends in the ROI would be conducted following selection of the SSC site. The analysis would be presented in the Supplemental EIS.

1547.71

Comment noted.

1547.72

The DOE has reviewed the submitted data during the site evaluation process and the preparation of the Final EIS.

1547.73

Comment noted.

1547.74

Comment noted. The information in this comment is consistent with that in Volume IV, Appendix 3 of the EIS.

1547.75

The information in this comment is, with one correction, consistent with EIS Volume IV, Appendix 3. "Each component part will be purged of its low-level radioactive components" is not correct. Actually, each system or facility will be stripped of its radioactive components, and these will be disposed of in DOE or State-owned, low-level radiactive waste (LLRW) disposal areas.

1547.76

The issue addressed by this comment is discussed in EIS Volume IV, Appendix 3. The estimated radiation exposure to workers is lower than the levels stated in the comment. The exposure to workers during decontamination of radioactive areas along the beam lines is estimated to be 0.3 person-rem or 300 person-millirem. This means that if ten workers participated equally in the work, they would each receive 30 millirems of exposure. The exposure to workers during removal of radioactive waste from the interaction regions is estimated to be 0.1 person-rem or 100 person-millirem. These estimated radiation exposure levels are considered to be insignificant.

1547.77

This observation is in agreement with Volume IV, Appendices 2 and 3.

It should be noted that Volume IV, Appendix 3 is a condensation of a detailed environmental and order-of-magnitude cost evaluation of one possible decommissioning plan for the SSC. As stated in the Appendix 3 introduction, the actual decommissioning plan and compliance with NEPA requirements for that plan would be completed before the end of the SSC operations.

Regarding operating cost, see also the revised cost estimate discussion in Volume III.

1547.78

Independent professional support of the EIS conclusions on waste disposal and decommissioning is acknowledged.

1547.79

First issue: The decommissioning description in Volume IV, Appendix 3 does not exclude the LEB, the MEB, and the HEB from consideration for reuse, althrough there are no specific plans for reuse at this time. If a viable reuse were determined for one or more of these accelerators, including the applications listed in this comment, it would be considered as an option when a detailed decommissioning plan is prepared.

Second issue: See Comment Response 381.04.

Third issue: Before sealing all accessways to the tunnel, a rigorous check would be made to assure no one was in the tunnel. Once sealed, the surface above the tunnel would be marked with signs and records would be filed with appropriate Government agencies in a manner similar to that done for underground pipelines. This would guard against inadvertent penetration of the tunnel.

Fourth issue: Based upon the history of tunneling in the Austin chalk and marl in the vicinity there is no potential of tunnel collapse around the ring.

1547.80

Comment noted.

1547.81

Both the ambient noise level increase and the high human annoyance impact categories provide an objective basis for impact evaluation that can be uniformly applied to the site alternatives evaluated. Although it is recognized that the high annoyance measure excludes determination of individual annoyance, it should also be recognized that determination of individual annoyance is best determined as a function of well-defined background levels, which were not available for application to the analyses performed. Guidelines for Noise Impact Analysis (U.S. Environmental Protection Agency 1982) recommends the use of high annoyance only as a human impact measure.

Although Volume IV, Appendix 9, Section 9.1.2 mentions only the degree of annoyance categorized as "highly annoyed," the technical background on which this category is based includes lesser degrees of annoyance that range downward to "no complaints." Volume IV, Appendix 9, Section 9.1.2.2 indicates that three ranges of sound level increase are recognized, and it is implied that two of these categories of environmental degradation are expected to lead to degrees of human annoyance that indicate some form of mitigation should be considered.

The Supplemental EIS will describe site-specific mitigation measures that can be implemented to reduce the extent of noise generation by, and propagation from, construction activities and operations of SSC facilities at the selected site. Implementation of these measures will limit the number of people who will be annoyed by noise. Possible measures are described in Volume IV, Appendix 9, Section 9.1.3.1.C.1.

1547.82

At this site selection stage for the SSC, it is not feasible to identify conditions, locations, or situations in which the SSC sounds are audible but have no influence on the value of day-night sound level (L_{dn}). Accordingly, the Invitation for Site Proposals did not ask for a high level of detail in the sound-level data. Noise impact modeling at this level of detail would be done on a site-specific basis as part of the environmental design. In an environment in which the pre-SSC value for L_{dn} is nominally 40 dBA and at distances greater than 6,000 ft from construction sites, uncharacteristic sounds may be audible in the normal background but will not be any louder than the background.

1547.83

Vegetation impacts on noise attenuation at the Texas site are expected to be minimal. Significant effects due to topography are also expected to be minimal (EIS Volume IV, Appendix 9, Section 9.1.3.9).

Wind speed and direction can affect the sound level at a specific location. If the wind is blowing directly from a noise source to a listener, the noise level will be higher than under still conditions because the wind will aid the transmission of noise through the air. If the wind is blowing directly from the listener to the noise source, the noise level will be lower than under still conditions because the wind will inhibit the transmission of noise through the air. Intermediate wind directions will produce intermediate effects on noise levels. This effect of the wind on noise levels will become more pronounced at higher wind speeds.

Wind speed will also impact the perception of noise by a listener by affecting background noise levels. Wind increases the background noise level by blowing vegetation and other materials. Therefore, the impact of noise will be less during windy conditions because the difference between the noise level and the background noise levels will be diminished.

The noise analysis performed represents a reasonably accurate picture of conditions likely to occur if the site were selected for the SSC project. More detailed analyses will be performed for the Supplemental EIS for the selected site.

1547.84

See Comment Response 1318.23.

1547.85

The theoretical attenuation of sound from a point source of noise is 6 dB for each doubling of the distance from the source. The theoretical attenuation of sound from a line source of noise is 3 dB.

A road construction site in which one or a limited number of pieces of equipment are used will tend to act like a point source of noise. However, a road construction site in which many pieces of equipment are used over a long distance will act like a line source of noise. Actual conditions at road construction sites will vary so that an attenuation rate between the point source and line source theoretical rates may be appropriate. It should be noted that as distance from the construction site increases the length of the construction zone will become less significant so that the noise attenuation rate will approach the points source value.

The point source noise attenuation rate (6 dB) was used to simplify the EIS analysis. This could result in an underestimation of noise levels in some cases. However, noise attenuation effects from vegetation and terrain were not considered.

The noise analysis performed represents a reasonably accurate picture of conditions likely to occur if the site were selected for the SSC project. More detailed analyses will be performed in the Supplemental EIS for the selected site.

Also note that in the paragraph cited in the comment, the phrase "of intensity" should be replaced with the phrase "having a sound level of." This has been incorporated in the EIS Volume IV, Appendix 9.

1547.86

A velocity of 2.0" per second is considered safe for poor plaster. See EIS Volume IV, Appendix 9, Section 9.2.2.1.C.1.

The stated purpose of the blasting vibration assessment was to "identify and evaluate the ground vibrations and airblast overpressure (noise) associated with the use of explosives for excavation during construction and to evaluate the possible impacts on public health, ecological resources, and structures." (See Volume IV, Appendix 9, Section 9.2.1.)

The stated conclusion of the section is that "Blasting will be controlled to reduce levels of vibration below that which produces structural damage, and to reduce levels of noise below that which will cause excessive public complaints and stress on animals." (See EIS Volume IV, Appendix 9, Section 9.2.4.)

1547.87

See second paragraph of Comment Response 1547.86.

1547.88

The impact threshold of "annoyance" is a preceived effect which may vary from individual to individual, and is highly subjective. For the purposes of this EIS, a threshold of "highly annoyed" was used to define significant adverse impacts from noise, although it is recognized that lesser noise levels can also be disturbing.

General criteria for assessing the impact of continuous noise and episodic events (blasting) on humans are not well developed. For the continuous noise assessment, the high annoyance measure, which is a function of the day-night average sound level, provided one convenient measure of associating an expected impact with a calculated sound level. In addition to calculating at what distances a certain measure of high annoyance occurs, the assessment (EIS Volume I, Chapter 5, Section 5.1.4 and Volume IV, Appendix 9) quantified the number of people currently living in areas which are expected to have elevated day-night average sound levels during operations. The assessment also quantifies the areal extent of the expected noise level increase. These calculations are noted as being appropriate in Guidelines for Noise Impact Analysis (U.S. EPA, Office of Noise Abatement and Control, Apr 1982). In absence of other generally accepted criteria, those discussed above provided a convenient method for uniformly assessing the relative impact of the project at the site alternatives.

For blasting, the peak-particle velocity (PPV) approach, which is indeed a structural damage criteria, was adopted because it provided an objective basis for assessing impacts at the site alternatives. EIS Volume IV, Appendix 9, Section 9.2.2 notes that to some extent it is impossible to avoid having people notice blasting occurring, and that some fraction will be annoyed at any perceptible level of ground vibration or blast overpressure. Human annoyance due to blasting is, however, highly correlated with damage to residences, and the mitigation plan presented is aimed at minimizing this annoyance. This annoyance will indeed be a function of PPV, and thus the structural criteria are justified.

1547.89

Comment noted.

1547.90

Our analysis is considered an upper bound of potential impacts and assures equitable treatment of all proposers. Until the collider ring location is agreed to by the DOE the exact acreages, parcels, and ownership cannot be determined. However, the EIS analysis does reflect an accurate picture of conditions that would exist should the SSC be sited in the referenced area (see EIS Volume IV, Appendix 4, Section 4.1).

1547.91

Comment noted.

1547.92

Comment noted.

1547.93

DOE agrees that no significant adverse economic impacts were identified in the EIS for the Texas site. The perception of a "positive" change on a socioeconomic setting is a subjective evaluation which can be determined in numerous different ways. The EIS attempts to present an objective study of the socioeconomic impacts on regional and local settings by measuring such indicators as the number of jobs, additional earnings, sales demand, housing demand, demand for public services, and public finance impacts created by the proposed SSC project. Certain changes in various indicators, such as growth in economic indicators, often are regarded as "positive." However, there can be side effects to this stimulus to growth which are not necessarily beneficial.

Negative side effects include short-term housing shortages and lack of adequate public services related to the inability of local government jurisdictions to finance capital improvements or meet increasing payroll requirements. Therefore, the socioeconomic analysis in the EIS quantifies estimates of additional housing requirements, public service demands, and government finance impacts from SSC-related growth. The analysis presented in the EIS was intended to provide enough information to provide a reasonable comparison among the sites. Additional details regarding the impacts of SSC construction and operations in Texas -- on the Region of Influence as well as Ellis County -- are presented in EIS Volume IV, Appendix 14, Section 14.1.3.7.A.

1547.94

Based on revised property value estimates for lands to be included in the fee simple transfer, estimates of net fiscal impacts to Ellis County have been recalculated (see Errata for EIS Volume IV, Appendix 14, Section 14.1.3.7.D, and Comment Response 226.01). The revised fiscal impact estimates still project positive impacts to Ellis County jurisdictions, but the differences between these and the TNRLC estimates presented in the comment are narrower.

1547.95

Property tax revenues typically are the major sources of income to public school districts. Lands in Ellis County slated for fee simple transfer would reduce property tax collections in the county by about $400,000 annually (see Errata for EIS Volume IV, Appendix 14, Section 14.1.3.7.D). The State mitigation assistance strategy would be included in the Supplemental EIS if Texas is the selected site.

1547.96

Most of the EIS population figures cited in the comment are correct, except for the following two: estimated population impact to rest of Ellis County (outside Waxahachie) in 1990 is 274, not 2,274; and estimated population impact to Waxahachie in 1999 is 1,799, not 1,711. The rows labelled "% difference" in the comment would more correctly be labelled "TNRLC estimate as percent of EIS estimate." The EIS analysis did not employ a traditional gravity model (see EIS Volume IV, Appendix 14, Section 14.1.2.3.8.2.b).

1547.97

In terms of its qualitative assessments of socioeconomic impacts (economic impacts, housing demand, public service demand, and public finance), the EIS for the most part supports the comment's contention that SSC impacts on Texas and Illinois would be similar (compare Volume IV, Appendix 14, Section 1.4.3.3 with Section 1.4.3.7). The exception is the anticipated impact on net cumulative fiscal benefits for local jurisdictions in primary impact counties: net positive impacts are anticipated to be greater in Texas (Ellis County) than Illinois (DuPage, Kane, and Kendall counties).

1547.98

The comment is considered to be a modification of the State proposal. The DOE believes the referenced section is correct based on the State proposal of March 31, 1988.

1547.99

See Comment Response 880.04.

1547.100

The comment's representation of the effects of stratified estates is correct. See Comment Responses 312.05 and 1548.68. Also see Comment Response 880.04 concerning land acquisition and compensation. responsibilities.

1547.101

Comment noted.

1547.102

The characterization of recent population growth in Ellis County provided in the EIS is similar to that noted in the comment: Ellis County population has been growing at increasingly rapid rates since 1970, with average annual growth between 1980 and 1985 at roughly 4.3

percent (see EIS Volume IV, Appendix 5, Section 5.7.11.B). Although the EIS did not contain population projections for Ellis County, it did note an anticipated continuation of growing County population as a consequence of the southerly expansion of metropolitan Dallas, once again concurring with similar claims stated in the comment.

The analysis of SSC-related socioeconomic impacts, including impacts to economy, housing demand, public services, and public finances, did not identify serious problems that would arise if the SSC were constructed and operated at the proposed Texas site (see EIS Volume IV, Appendix 14, Section 14.1.3.7).

1547.103

See Comment Response 1547.95.

1547.104

Comment noted.

1547.105

See Comment Responses 13.02 and 710.01.

1547.106

Knowledge of the ownership of specific wells was not required in the EIS, however, the Texas Department of water resources indicates that there are two domestic wells within a 1,000-ft band along the tunnel alignment or within the campus buffer and buried beam zones, and far cluster areas (see Volume IV, Appendix 7, Figure 7-21). It is possible that neither of these wells would be directly affected or required to be abandoned by the project (see Volume IV, Appendix 7, Section 7.2.3.7.A.6).

1547.107

The "disturbed acres" are the estimated total surface acres to be disturbed by construction of the SSC. The Table and estimates of acreage disturbed have been revised. As now shown in Volume I, Chapter 3, Table 3-2, a total of 1,647 acres of land in Texas would be disturbed by SSC construction. Of this area, the actual amount of ecological habitat disturbance cannot be accurately estimated until a final design nears completion. The final design will take into account more sensitive habitats, and attempts will be made to place them in lower quality or more common habitats. These potential habitat losses will be fully addressed in a Supplemental EIS should Texas be chosen as the SSC site.

1547.108

Intensive cultural resources surveys to identify prehistoric and historic archaeological sites and historic buildings have not been undertaken at the proposed Texas SSC site. Other historic buildings could be identified during such surveys. If the Texas SSC site is selected, cultural resources, including the Dunaway house, would be evaluated using National Register criteria to determine their eligibility for listing on the National Register of Historic Places. The State designation is not sufficient with regard to application of Section 106 review compliance process of the National Historic Preservation Act.

1547.109

Impacts on housing demand as a result of locating the SSC in Texas are examined in the Texas Region of Influence (ROI) (which includes Dallas, Ellis, and Tarrant Counties), as well as in Ellis County individually (Volume IV, Appendix 14, Section 14.1.3.7.B). The results of this analysis concur with the present comment: adequate housing exists in both the ROI and Ellis County to accommodate anticipated SSC-related growth.

1547.110

Information presented in the comment on the Dallas/Fort Worth International Airport is generally consistent with Volume IV, Appendix 5, Section 5.7.11.2.A.2. However, according to the Federal Aviation Administration, the airport experienced 75,000 hours of delays in 1986. These delays are forecasted to increase to 90,000 hours by 1996. According to Federal Aviation Administration guidelines, these figures generally represent congested conditions. It is acknowledged that the airport expansion programs discussed in the comment would help to mitigate the delays.

1547.111

See revised text EIS Volume 1, Chapter 3, Table 3-5 and 3-6.

1548.01

Comment noted.

1548.02

See Comment Responses 1043.34, 1043.35, and 1043.36.

1548.03

See Comment Responses 1043.37.

1548.04

See Comment Responses 1043.38.

1548.05

The figure has been corrected in the Errata based on the comment.

1548.06

See Comment Response 1052.02.

1548.07

The text of EIS Volume IV, Appendix 7, Section 7.1.3.5 has been modified in response to the comment.

1548.08

See Comment Response 1052.04.

1548.09

See Comment Response 1052.04

1548.10

See Comment Response 1052.04.

1548.11

See Comment Response 1052.07.

1548.12

Comment noted.

1548.13

See Comment Response 428.15.

1548.14

See Comment Response 1043.40.

1548.15

See Comment Response 428.15.

1548.16

See Comment Response 1043.42.

1548.17

See Comment Response 1043.43.

1548.18

See Comment Response 1043.44.

1548.19

See Comment Responses 1043.02, 1043.03, 1043.04, and 1043.05.

1548.20

See Comment Response 1043.02.

1548.21

See Comment Response 1043.07.

1548.22

See Comment Response 1043.08.

1548.23

See Comment Response 1043.09.

1548.24

See Comment Response 1043.10.

1548.25

See Comment Response 1043.11.

1548.26

See Comment Response 1043.12.

1548.27

See Comment Response 1043.13.

1548.28

See Comment Response 1043.14.

1548.29

See Comment Response 1043.15.

1548.30

See Comment Response 1043.16.

1548.31

See Comment Response 1043.17.

1548.32

See Comment Response 1043.18.

1548.33

See Comment Response 1043.19.

1548.34

See Comment Response 1043.20.

1548.35

See Comment Response 1043.21.

1548.36

See Comment Response 1043.22.

1548.37

See Comment Response 1043.23.

1548.38

See Comment Response 1043.24.

1548.39

See Comment Response 1043.25.

1548.40

See Comment Response 1043.26.

1548.41

See Comment Response 1043.27.

152615503358823

1548.42

See Comment Response 1043.28.

1548.43

See Comment Response 1043.29.

1548.44

See Comment Response 1043.30.

1548.45

See Comment Response 1043.31.

1548.46

See Comment Response 1043.32.

1548.47

Comment noted.

1548.48

See Comment Response 734.01.

1548.49

EIS Volume I, Chapter 4, Table 4-16 has been corrected to include woodlands, croplands, and pasture under North Carolina terrestrial ecotypes.

1548.50

A Category 1 candidate species is a species that has been proposed for listing as an endangered species. It must remain a candidate species until it is actually listed by the U.S. Fish and Wildlife Service.

Corrections in the candidate status of the other species in EIS Volume I, Chapter 4, have been made.

1548.51

If North Carolina is the selected site, the DOE will work with the North Carolina Natural Heritage Program regarding state species of concern and appropriate mitigation programs. Also see Comment Response 1043.62.

1548.52

See Comment Response 1043.62.

1548.53

See Comment Responses 1043.67 and 1043.68.

1548.54

See Comment Response 1043.78.

1548.55

Volume I, Chapter 5, Section 5.1.7.2 has been revised. The North Carolina Soil Conservation Service estimates 4,374 acres of prime farmland and 2,265 acres of important farmland in the fee simple project area. This would mean that 630 acres of prime and 325 acres of important farmland would be permanently removed from production by the project.

1548.56

See Comment Responses 1043.71 and 1548.55.

1548.57

See Comment Response 1043.72.

1548.58

See Comment Response 1043.72.

1548.59

See Comment Response 1043.72.

1548.60

See Comment Response 428.78.

1548.61

See Comment Response 1043.78.

1548.62

See Comment Response 1043.79.

1548.63

The discussion of disturbed areas in the EIS has been revised. A total of 1,914 acres would be disturbed in North Carolina if the SSC were constructed there. Approximately 1,107 acres of this area would be permanently disturbed by project facilities (EIS Volume I, Chapter 3, Table 3-2).

The perimeter of Areas A and B encompass approximately 2,050 acres, which in North Carolina includes approximately 310 acres of agricultural land and 1,730 acres of natural systems including 38 acres of wetlands (Volume I, Chapter 4, Section 4.7.1). Construction activities in Areas A and B will require 476 acres of land, 283 of which will be permanently disturbed by buildings and support facilities. During final design, consideration will be given to avoiding wetlands and placing the SSC facilities (including spoils disposal sites) in habitats with lesser value. Mitigation activities are expected to reduce the overall impact of the temporary loss of 476 acres and the permanent loss of 283 acres.

Discussions regarding disturbed habitats at the North Carolina site resulting from ancillary facilities, including pipelines, transmission lines and roads, are located in Volume IV, Appendix 11, Section 11.3.5.4.A. The actual amount of disturbed habitat resulting from these facilities will vary, and cannot be estimated more accurately until a final design is approached. As the placement of these facilities is quite flexible, final design of the ancillary facilities will take into account more sensitive habitats, and attempts will be made to place them in lower-quality or more common habitats.

Fifty three wetlands totaling 153 acres occur in areas associated with surface facilities at the proposed site in North Carolina (see Volume I, Chapter 5, Section 5.1.5.3 and Volume IV, Appendix 11, Section 11.3.5.3). Of this total, only 64.9 acres are comprised of palustrine forest wetlands. In addition, wetlands that may be affected by construction of SSC surface facilities in North Carolina total only 44.4 acres (Volume IV, Appendix 11, Table 11.3.5.3-1) and include 16.2 acres of palustrine forested acres.

1548.64

The estimates of the number of acres to be disturbed by the project have been revised throughout the text. In North Carolina a total of 1,914 acres would be disturbed by project construction. Of this area, approximately 1,107 acres would be permanently disturbed by buildings and support facilities (Volume I, Chapter 3, Table 3-2). If North Carolina is selected, consideration will be given to minimizing the area of project impacts and avoiding sensitive habitat areas during development of the final project design. A preliminary discussion of mitigation opportunities is presented in Volume IV, Appendix 11, Section 11.3.5.1.

1548.65

The resource reclamation practice suggested in the comment has been noted, and if implemented, would minimize wastage of natural resources in the project area. Should North Carolina be selected, a site-specific Supplement to the EIS will analyze in detail mitigation measures to reduce project impacts at the site. See EIS Volume IV, Appendix 11, Section 11.3.5.

1548.66

Best engineering practices will be used to control runoff and prevent siltation to both waterways and adjacent nondisturbed lands. Specific design of erosion control measures for spoils management and other temporarily disturbed lands will depend upon the final design and will be analyzed Supplemental EIS for the selected site.

1548.67

Comment noted. Forest resources for the North Carolina site are discussed in EIS Volume IV, Appendix 5, Section 5.5.9.

1548.68

See Comment Response 312.05. The concept of stratified fee is being used to provide a minimum of interference with existing land use. The DOE does not anticipate the use of restrictive easements on property where a stratified fee estate exists. This includes access to minerals or wells, provided that there is no penetration of DOE's stratified fee estate without prior DOE written approval. The "rights and privileges" of affected residents under a stratified fee estate are discussed in Appendix IV, Section 4.2.1.2. Surface interest will remain in its present ownership and is not the DOE's responsibility.

In stratified fee areas surface management should experience no disruption. It is DOE's intention to promote wherever possible the maintenance of the local natural landscape.

1548.69

If North Carolina is the selected site, the DOE would work closely with the Division of Forest Resources to minimize adverse impacts. Additional information regarding mitigation options available to reduce environmental impacts at the selected site will be evaluated in the Supplemental EIS for the selected site.

1548.70

See Comment Response 1043.80.

1548.71

See Comment Response 1278.30. Although a species diversity survey has not been done, a general wetland quality survey was conducted. See Volume IV, Appendix 11, Section 11.3.5.3.

1548.72

See Comment Response 1043.82.

1548.73

See Comment Response 754.06.

1548.74

See Comment Responses 1043.86 and 1043.87.

1548.75

Groundwater infiltration into the tunnel is not expected to affect water levels and flow in surface waters to any measurable degree since tunnel inflow is expected to be small. Most of the tunnel will be in solid, impermeable rock. Any zones of water inflow (such as open fractures) will be isolated immediately and sealed off by grouting or installation of a waterproof liner. Major dewatering is not anticipated based on the hydrologic information available to date (see EIS Volume IV, Appendix 5, Section 5.5.2.2). Consequently, no impacts are expected on aquatic species in surface waters as a result of groundwater inflow into the excavations, including tunnel. See Comment Response 1513.53 which describes the expected rates of tunnel infiltration and the methods available for controlling it.

1548.76

There is no critical habitat for known Federally-listed threatened and endangered species in the vicinity of the proposed North Carolina site. The statement that there are no Federally-listed species known to be in the vicinity has been deleted, and statements have been added to indicate the possible presence of the newly-listed endangered wetlands plant, harperella, and two endangered species of bird, bald eagle and peregrine falcon; although habitat for neither of these bird species is present on the site.

Additional information concerning species listed or proposed for listing by the State of North Carolina has been added to the EIS in Volume IV, Appendix 11. A discussion was also added of sensitive habitats that may contain populations of rare plant life. The assessment of impacts has been revised in Volume I, Chapter 5. More detailed studies will be performed at the selected site and discussed in the Supplemental EIS.

1548.77

See Comment Response 1043.90.

1548.78

All power requirements of the SSC, with the exception of emergency diesel power generators, will be provided by the existing network of public electric power utilities. The added operating load for meeting

SSC power requirements and the resulting power plant emissions will be accommodated under existing SIP emission limits. The limits are designed to provide for attainment and maintenance of AAQS under worst case operating conditions of all regulated sources. This includes electric power generation at rated power plant capacities.

"Acid rain" and global warming are extremely complex environmental issues that are global and international in scope. Comprehensive national and international research efforts are currently in progress to specifically address the scientific uncertainties that will need to be addressed before comprehensive assessments and policy analyses can be performed. These assessments and analyses will require large-scale computer models that are currently being developed on supercomputers. The models will require comprehensive testing and evaluation and the collection of very large databases. The formulation of policy options to address the "acid rain" and "greenhouse effect" problem will involve a large effort and require national and international cooperation.

1548.79

If the North Carolina site is selected for further investigation, all areas that are likely to be adversely affected by project development would be surveyed for the presence of unique and sensitive habitats and for rare and protected species to determine the presence of such species and to evaluate the potential effects of project development. Results of this research effort would then be addressed in the Supplemental EIS. Information would also be used, in consultation with USFWS and North Carolina resource management agencies during the preconstruction and construction phases, to develop, implement, and monitor effective mitigation measures. See EIS Appendix 11, Section 11.3.5.

1548.80

The North Carolina Soil Conservation Service estimates 4,374 acres of prime farmland and 2,265 acres of important farmland in the fee simple project area. This would mean that 630 acres of prime and 325 acres of important farmland would be permanently removed from production by the SSC project. This acreage represents less than 1 percent of North Carolina's prime and important farmland inventory. In terms of global warming, this effect is insignificant.

1548.81

DOE-committed mitigations are presented in Volume I, Chapter 3, Section 3.6.2, with possible mitigations listed in Section 3.6.3. To the extent practicable, the DOE would avoid placing SSC facilities in floodplains to minimize potential harm to and from the floodplain environment. Moreover, potential impacts to natural resources and sensitive species and habitats would depend on final design considerations for and placement of specific facilities, and would be evaluated for the selected site in the Supplemental EIS. These issues are addressed in many sections of

Volume IV, Appendix 11: in the introduction of Section 11.3.5, Sections 11.3.5.1 and 11.3.5.3.C for wetlands habitats; and at the end of Section 5.5.9.5.a in Appendix 5. The mitigative procedure for the North Carolina site described in the comment, if implemented, could minimize any adverse impacts to the environment described in the EIS; however, it is the State's responsibility to provide all land required for the SSC project.

1548.82

See Comment Response 1043.95.

1548.83

Changes in the text have been made so that this contradiction about the transition zones is no longer present. A similar change has been incorporated into the identical text found in Volume I, Chapter 4, Section 4.7.5.5. The sentence concerning the similarities among the three river systems does not state that the three river systems are similar to other streams in the State, but rather that these streams are similar only to each other.

1548.84

Based on results of the recent survey of local streams conducted by the North Carolina Wildlife Resources Commission, three species of freshwater mussel (designated as State Species of Special Concern) have been added to Volume I, Chapter 4, Section 4.7.4.2.

1548.85

See Comment Response 1043.98.

1548.86

See Comment Response 658.40.

1548.87

See Comment Response 1043.100.

1548.88

See Comment Response 1043.100.

1548.89

See Comment Response 1043.100.

1548.90

See Comment Responses 1043.100 and 1043.104.

152615503358830

1548.91

See Comment Response 1043.100.

1548.92

See Comment Response 1043.100.

1548.93

See Comment Response 1043.100.

1548.94

See Comment Response 1043.109.

1548.95

See Comment Response 1043.100.

1548.96

See Comment Response 1043.111.

1548.97

See Comment Response 1043.112.

1548.98

See Comment Response 1043.113.

1548.99

EIS Volume I, Chapter 4, Section 4.7 makes several references to the known wildlife database. For example: Table 4-16 compares ecological characteristics of site alternatives, including wildlife. Section 4.7.2 describes the headwaters, plus first and second order streams, including terrestrial and aquatic ecosystems. Section 4.7.3 refers to bird and mammal game species found throughout the North Carolina site: species were defined and named. Also, in Section 4.7.3 the number of Federally threatened, endangered, candidate and review species are totaled. Table 4-17 lists these species by name and Table 4-18 lists North Carolina-protected species.

1548.100

In North Carolina a total of 1,107 acres of land will be permanently disturbed. This acreage includes 315 acres which will be permanently occupied by spoils disposal areas and evaporation ponds. The commenter is correct that native plant and animal communitities occupying these

areas would be displaced and/or destroyed. This loss cannot be totally mitigated. However, several opportunities for mitigation including location of areas, configuration or layout of these areas, and use of best engineering practice for sedimentation and runoff control (as discussed in EIS Volume I, Chapter 3, Section 3.6 and Chapter 5, Section 5.1.2.1) will be employed to minimize the loss. Should North Carolina be selected, additional decisions of locations, habitats to be impacted, and possible mitigative measures will be presented in the Supplement to the EIS.

1548.101

See Comment Response 1043.116.

1548.102

See Comment Responses 1043.117 and 1513.142.

1548.103

At road crossings, bridges will be properly built to minimize or avoid encroachment of floodplain and habitat. The impact of soil erosion and water pollution will be mitigated by minimization of disturbed areas, rapid revegetation, and well-maintained sediment basins. With implementation of proper mitigative measures, the impacts are expected to be generally limited to the construction period and insignificant. Detailed discussion of impact mitigations are presented in Volume I, Chapter 5, Section 5.1.2.1 and Volume IV, Appendix 7, Section 7.1.2.2.D.2.

1548.104

See Comment Response 1043.119.

1548.105

A high percentage of SSC water use is related to collider operation and water use will vary over time. Water use could be limited during periods of drought by limiting operations. All efforts will be made to reduce nonessential water use during drought periods.

1548.106

See Comment Response 1043.121.

1548.107

The recommendation given in the comment has been incorporated in the EIS, in Volume I, Chapter 5, Section 5.1.5.1.B.5.

1548.108

If the North Carolina site is selected, improvements to a four-lane divided highway and new construction of several access roads are slated for possible development in the area of the Flat River slopes above Lake Michie (see EIS Volume IV, Appendix 11, Section 11.3.5). The design and schedule for construction associated with those roadways would be the responsibility of North Carolina.

However, more detailed studies, including mitigation recommendations, would be included in the Supplemental EIS. The DOE would cooperate in coordinating environmental matters related to these facilities.

1548.109

Volume I, Chapter 5, Section 5.1.5.2 has been revised to include additional information on protected species which was obtained since completion of the DEIS. The statement that there are no Federally listed animal species known to be in the proposed site area has been deleted from the section. Harparella, a Federally-listed endangered wetlands plant whose status has recently been changed, is known to occur in an area along the Tar River approximately 2 mi downstream of the collider ring. The plant is not known to occur on or within the ring. Two Federally-listed species of birds are potentially present in the region containing the proposed North Carolina SSC site. The endangered bald eagle and peregrine falcon are occasionally found in the region as wide ranging migrants, but neither is expected to breed locally, and habitats for these species are not present at the North Carolina SSC site.

1548.110

EIS Volume I, Chapter 5, Section 5.1.5.3 has been rewritten and no longer contains the statements commented on. Cumulative impacts to wetlands are discussed in Volume I, Chapter 5, Section 5.2.7.

1548.111

The EIS, Volume I, Chapter 5, Section 5.1.8.1 indicates that during peak construction the in-migrant work force levels are the highest of all seven sites at 5,000 persons.

These levels will decline as construction is completed and operations begin.

Volume IV, Appendix 13, Section 13.1.4.E discusses growth implications at the regional level. While it is noted that SSC project development is likely to be a major source of growth, it is expected that the regional housing supply will be adequate to handle both SSC workers as well as other newcomers. As a consequence, it may be difficult to separate out the direct effects of SSC project development from the general pattern of regional growth.

1548.111

Volume IV, Appendix 5c, Section 5.5.10.1.F discusses future planned land uses, which includes mention of the Durham County Critical Watershed Ordinance, the Durham County General Development Plan-2005, and the Person County Development Plan 1985-1995. The issues raised regarding water supply, air quality, and preservation of natural ecosystems are considered as part of their respective planning goals and objectives.

See Comment Response 384.02 for a discussion of the DOE policy for the need for and value of establishing intergovernmental relationships.

For a discussion of the cumulative impacts of SSC induced growth on current land use patterns see Volume I, Chapter 3, Section 3.7.1.

1548.112

The quoted sentence is found in Volume I, Chapter 5, Section 5.1.10. Due to the proposed buffer area around the spoils disposal sites, public views of the sites are not expected to occur. Therefore, there would be no visual impacts due to the spoils disposal area.

Concerning impacts on wetlands, distances between the proposed spoils disposal sites and the closest associated wetlands range from 300 to 1,000 ft (most are 600 to 1,000 ft) (see Volume IV, Appendix 10, Table 10.2.3-7). These distances are sufficiently great that few indirect impacts (e.g., erosion) to wetlands would occur. Nevertheless, if North Carolina is selected, more detailed preconstruction analysis would be required for each disposal site. This would include a consideration of surrounding land types and species assemblages and an evaluation of mitigative measures to protect them. Such review and analysis would be detailed in the supplement to the EIS.

1548.113

The DEIS statement that the fauna of the proposed site are typical of the North Carolina Piedmont has been corrected in the Errata to Volume IV, Appendix 5, Section 5.5.9.2.B. Results of the fresh water mussel survey, as well as additional information concerning Federal and State protected species, have been incorporated into Volume IV, Appendix 11, Section 11.3.5.2. This survey, while limited in area covered, was more extensive than implied by the comments.

It is acknowledged that the North Carolina SSC site is part of a significant ecological region, with unique natural habitats and native species. Field wildlife surveys for protected species would be initiated if North Carolina is selected and these surveys would provide additional information on the biogeography of the region. If sensitive or listed, species and habitats are present and could be affected by the SSC, consultation with the U.S. Fish and Wildlife Service and with State

agencies will take place during all site investigation and design phases (EIS Volume IV, Appendix 11, Section 11.3.5.2), in compliance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543). Measures to avoid or reduce adverse impacts to unique habitats and species would be applied in consultation with the USFWS and appropriate State agencies.

1548.114

Information provided by the North Carolina Water Resources Commission regarding the fresh water mussel surveys conducted recently in streams in the vicinity of the proposed North Carolina SSC site has been reported in EIS Volume IV, Appendix 11.

1548.115

See Comment Response 1548.114.

1548.116

See Comment Response 1043.132.

1548.117

The sources of pollution cited by the commenter are potential sources that might impact surface water quality if appropriate engineering controls and mitigative measures are not utilized. As discussed in Volume I, Chapter 5, Section 5.1.2.3 and Volume IV, Appendix 7, Sections 7.1.2.2 and 7.1.3.5.F of the EIS, there are a number of mitigative measures under consideration that can be effective in reducing or eliminating water pollution. In addition, impacts to wildlife resources of area streams are discussed in Volume I, Chapter 5, Section 5.1.5 and in Volume IV, Appendix, Section 11.3.5. If the North Carolina site is selected, detailed mitigation plans specific to each stream potentially affected by SSC construction activities would be developed and discussed in a Supplemental EIS.

Effluents discharged to receiving water from any project activities, such as tunnel dewatering, would be subject to conditions of an NPDES permit. Permit conditions typically specify concentration limits for pollutant discharges, monitoring requirements, and corrective actions expected for effluent exceedences. The permit conditions are typically tailored to specific ecological conditions, which would include consideration of rare and sensitive species, of receiving waters and the downstream mixing zone.

1548.118

See Comment Response 1548.79.

1548.119

See Comment Response 15.01. The Memorandum of Agreement would address potential direct and indirect impacts to cultural resources, as appropriate to the general project area.

1548.120

See Comment Response 570.01.

1548.121

Volume I, Chapters 4 and 5 and Volume IV, Appendix 15 has been revised to describe the comprehensive historic structures surveys in Granville and Durham Counties and to identify the Bennehan-Cameron Plantation as a site determined to be eligible to the National Register of Historic Places.

1548.122

EIS sections cited have been modified to include the additional information provided.

1548.123

Comment noted.

1548.124

A reservoir upstream of site 1471 would not inundate the presently proposed SSC areas. However, the construction of a reservoir within 0.5 miles would potentially conflict with SSC operations. Areas of concern would include vibration associated with rock blasting and the possible raising of groundwater hydraulic pressure. If the North Carolina site is selected, a detailed site investigation will be conducted to assess the potential impact to the SSC of the proposed reservoirs and visa versa. Results of the investigation will be addresssed in the Supplemental EIS. Please also see Comment Response 1106.10 and 1272.02.

1548.125

The current location of J2 coincides with reservoir site C. Additionally, there is a proposed disposal site for excavated materials near J2 at an elevation of about 450 ft (Volume IV, Appendix 10, Section 10.2.3.5,). If the Flat River is impounded, this disposal site would be very near the impounded water, since pool elevations of the proposed reservoirs downstream are 430 ft (site A) and 440 feet (site B and C). See Comment Responses 1106.10 and 1272.02.

1548.126

See Comment Responses 1106.10 and 1272.02.

1548.127

See Comment Responses 703.02 and 1106.11.

1548.128

The use of the SSC tunnel as a water supply conduit would likely be impractical because of the extensive and very expensive modifications to the tunnel that would be required. Also, the need for water exchange between communities would appear to be rare.

1548.129

See Comment Responses 1106.10 and 1272.02.

1548.130

See Comment Response 734.01.

1548.131

Comment noted.

1548.132

See Comment Response 709.02.

1548.133

EIS Volume IV, Appendix 13, Section 13.1.1 states that it has been anticipated by the DOE that the SSC may trigger zoning changes. The Federal Government is not subject to local zoning and land use restrictions. However, it is DOE policy to accommodate local zoning ordinances and design standards to the extent practicable. See Comment Response 384.02.

1548.134

See Comment Responses 1106.10 and 1272.02.

1548.135

See Comment Response 716.06.

1548.136

See Comment Response 1106.06, second paragraph.

1548.137

The North Carolina proposal infers that the East End Connector is a high-priority road improvement that would be constructed with or without the SSC. Therefore, the highway has not been included in the EIS as part of the North Caroina site alternative; instead it is included in the no-action alternative.

Reference to the East End Connector has been added to the discussion of long-range highway construction plans in the Errata to Volume IV, Appendix 5, Section 5.5.11.2.A.1.

1548.138

Comment noted.

1548.139

See Comment Responses 1106.10 and 1272.02.

1548.140

See Comment Responses 1106.10 and 1272.02.

1549.01

Comment noted.

1549.02

See Comment Responses 856.06 and 861.06.

1549.03

PCBs will not be used in any SSC equipment. Therefore, should the SSC be sited in Illinois, the existing PCB storage at Fermilab would not increase.

1549.04

Currently a minimal amount of low-level radioactive waste (LLRW) is stored at Fermilab prior to shipment to a LLRW disposal site. It is the waste management policy at Fermilab to collect, process, and dispose of LLRW off site as it is generated. The LLRW is stored until a full shipment is collected. Therefore, the quantity of LLRW stored at Fermilab should not increase (as the LLRW is only held until a full shipment can be made) if the SSC were to be sited at the proposed site in Illinois.

1549.05

See Comment Response 533.03.

1549.06

The comment concerning Illinois air quality ranking is noted. There are many ways that could be used to rank relative air quality. Without the commenter having furnished the rationale for comparison, no response to the comment ranking can be made.

Changes in levels of carbon monoxide (CO) were considered in evaluating the impact of the SSC project if sited in Illinois. EIS Volume IV, Appendix 8, Table 8-27 addresses the impact of CO levels in three Counties: DuPage, Kane, and Kendall (the Table has been modified as stated in Comment Response 715.03). The increase of CO caused by construction will be 0.34 percent and the level increase from operations will be 0.12 percent. It was therefore concluded in Volume IV, Appendix 8, Section 8.4.3.2 that, "The SSC would produce a negligible incremental addition to the air emissions in the area."

Changes in noise levels were considered in evaluating the impact of the SSC project. In Volume IV, Appendix 9, Section 9.1.3.1 the following conclusion was reached:

"Increased passenger vehicle traffic on roads during both construction and operations will not have the potential to create significant noise impacts. Doubling traffic on a road, for example, will increase the noise impact of a road by 3 dBA (Fader 1981). Area residents are likely to be annoyed by noise levels from roads which experience increased traffic as a result of SSC."

1549.07

Impacts from blasting and resulting vibrations are discussed in EIS Volume I, Chapter 5, Section 5.1.4.2, which also describes air blast overpressure. A monitoring and mitigation plan is outlined in Section 5.1.4.2 A 1. Additional information on blasting and mitigation techniques may be found in the Comment Response 1278.35.

Information on the Illinois "Good Neighbor" policy, which addresses compensation for liability for certain blasting damage, is given in the Comment Response 1279.48.

The liability of the construction contractor for damage to off-site properties would be determined in accordance with applicable law. Any liability of the U.S. Government would be pursuant to the Federal Tort Claims Act.

1549.08

Discussion of existing public services, including public education, in the Illinois Region of Influence and Kane County is found in Volume IV, Appendix 5, Section 5.3.11.1.C. See also Comment Response 867.03.

1549.09

See Comment Response 1551.01.

Extensive coverage of the impacts from Fermilab operations is contained in the annual environmental reports issued by Fermilab and available to the public.

1549.10

Comment noted.

1550.01

Comment noted.

1550.02

Underwriters Laboratories is an organization dedicated to consumer product safety and certifies the safety of electrical goods and appliances. This organization has no authority or expertise to evaluate the safety of a highly complex machine such as the SSC. The safety standards in place at Fermilab, as well as those that will be prepared for the SSC, incorporate the combined expertise of many scientists, engineers, health and safety specialists, and craft specialists to ensure the integrity and safety of the collider equipment and its operations (see EIS Volume IV, Appendix 12). The DOE is required to comply with all applicable Federal, State, and local environmental safety and health regulations. A list of current Federal permits, licenses, and other environmental regulations related to SSC construction and operations can be found in EIS Volume I, Chapter 6, along with applicable DOE Orders.

1550.03

Epidemiological studies such as that proposed by the commenter are major undertakings that can be time-consuming and expensive and are usually initiated when there is sufficient cause to conduct a study and when there is a reasonable chance of being able to conduct a meaningful and scientifically defensible study. One reason in favor of not conducting a study to test a hypothesis about radiation exposures and effects in the general population around Fermilab is that the worst-case radiation exposure levels in the area, which have been estimated through the environmental monitoring program, have been so low that it would be unlikely that any human health effects could have occurred. Also, if any effects have in fact occurred and are related to very low dose radiation exposures, such an event would be so unusual that it would be nearly impossible to detect an increased risk attributable to Fermilab operations given the normal baseline level of diseases and disorders that exist in any human population. If it were found through a reliable surveillance system or study that residents near Fermilab or any other part of Illinois were experiencing an apparently elevated risk of a serious health outcome, then it would be appropriate to consider an

epidemiological study to determine the causes of the problem. Such undertakings are typically initiated by State health departments. If an epidemiological study were determined to be appropriate in the community surrounding Fermilab, the DOE would be supportive and would provide environmental monitoring data and other assistance as needed.

1550.04

The suggested study is not a scientifically valid monitoring method.

1550.05

There is an environmental monitoring program at Fermilab, which monitors environmental media and vegetation for releases from laboratory operations. The program publishes its findings on an annual basis and the most recent report is for the year 1987 (Fermilab 88/40 1104.100 UC-41, Site Environmental Report for Calendar Year 1987, May 1987, Samuel I. Baker). The program is required by DOE order 5480.1A.

Monitoring of an on-site medium or vegetation is conducted when a medium could be impacted by operations.

1550.06

See Comment Response 1550.04.

1550.07

An annual vegetation sampling program was initiated in calendar year 1978. Vegetation samples were taken near the exhausts in the neutrino area in addition to vegetation samples in areas with waterborne radioactivity. The results from the analyses of the vegetation samples indicated no additional radioactivity introduced into the biosystem above background. Because of the extremely low levels of radioactivity measured in plant tissues, there is no scientific evidence of any mutation or other abnormalities. Detailed descriptions and results may be found in annual Fermilab Site Environmental Report.

1550.08

The impacts from potential operational accidents at the SSC were examined and are discussed in Volume IV, Appendix 12, Section 12.4.

The SSC is not an experiment to find new ways of converting matter into energy. The purpose and need for action for the SSC are described in Volume I, Chapter 2. Collisions of particles of much higher energy than those of the SSC are occurring constantly and have been occurring throughout earth's history, in the upper atmosphere, when very high energy cosmic rays strike the molecules in the atmosphere. No new or

different physical process would be created by the SSC. The SSC will permit scientists to study these processes under controlled laboratory conditions.

See also Comment Response 1195.06, first paragraph.

1550.09

Security of the SSC facility will be addressed in the Safety Analysis Reviews (SAR) to be prepared for construction and operations phases of the SSC. The SARs will focus on significant hazards and will address impacts and mitigative measures (EIS Volume I, Chapter 5, Section 5.1.6.1).

1550.10

The DOE is required to comply with all applicable Federal, State, and local environmental safety and health regulations. A list of current Federal permits, licenses, and other environmental regulations related to SSC construction and operations can be found in Volume I, Chapter 6, along with applicable DOE Orders. The SSC is designed to operate well within the permissible limits specified in these regulations.

1550.11

Comment noted.

1551.01

The DOE assigns responsibility to its operating contractors for the safe operation of DOE facilities through contractual obligations that include compliance with a variety of environmental safety and health regulations (EIS Volume I, Chapter 6). The DOE requires that its operating contractors conduct periodic performance appraisals, including environmental safety and health protection appraisals. These appraisals are performed in accordance with the requirements of the DOE Orders (EIS Volume I, Chapter 6). Additionally the DOE maintains an oversite role and conducts regularly scheduled evaluations of its contractors. The authority for the DOE oversite role and the responsibility charged to the DOE operating contractors is generally contained in the contract Health and Safety Clause, which necessitates that the contractor comply with all applicable Federal, State, and local environmental safety and health protection laws, standards, and criteria. The DOE has operated high energy physics facilities similar to the SSC in compliance with environmental protection laws. Fermilab publishes an annual site Environmental Report (see Site Environmental Report For Calendar Year 1987, Fermilab 88/40 1104.100 UC-41). This report receives widespread distribution, including the U.S. Environmental Protection Agency, and various State regulatory agencies.

1551.02

See Comment Responses 810.05 and 1117.04.

1551.03

See Comment Response 627.01.

1552.01

Comment noted.

1552.02

The concerns for the health and safety of the general public are discussed in EIS Volume I, Chapter 5, Section 5.1.6. This includes the impacts resulting from tunnel construction as well as the impacts from radiation and hazardous/toxic substances and the disposal of soil and liquid wastes throughout the construction and operation of the project. See also Comment Response 1091.02.

1553.01

See Comment Response 1304.01, which contained the same attachment.

1554.01

Comments noted.

1554.02

Comments noted.

1554.03

The SSC will be sited, designed, constructed, and operated in strict conformance with applicable Federal, State, and local environmental safety and health protection criteria, regulations, and standards to assure adequate protection of both the SSC work force and the general public.

For concerns on the impact to wetlands and associated mitigation, see Comment Response 1292.05.

Temporary effects on both water quality and water levels of shallow groundwaters are expected from construction and operations of the SSC, but these will be small because of the use of environmentally sound construction and effluent control techniques. A long-term impact is expected on the current overdraft of the aquifers. The impact will be small, since the incremental water needs of the SSC will be small in comparison to existing water uses. The predicted groundwater impact of the SSC at the proposed Illinois site is described in Volume IV, Appendix 7, Section 7.2.3.3. See also Comment Responses 18.03 with respect to groundwater quality impact and 533.03 with respect to groundwater supply impact.

As noted in the "Superconducting Super Collider Conceptual Design Report," March 1986 (SSC-SR-2020) and in the Superconducting Super Collider Environmental Radiation Shielding Task Force Report, July 1987 (SSC-SR-1026), the abort areas are designed to allow continued, safe occupation within the stratified fee zones. The overall radiation exposure to stratified fee residents is expected to be an immeasurable amount of less than 0.001 mrem/yr. This amount is insignificant, considering that the average individual receives about 360 mrem annually from background radiation (see Volume IV, Appendix 12, Section 12.2.1.1.A).

Magnets will not explode. They may quench (warming up so they lose their superconducting capability), or they may encounter different types of failures that would take them out of service.

The DOE's health protection criteria are designed with ample conservatism and contingencies to provide adequate protection of the general public living above of the SSC.

1554.04

Comments noted. Socioeconomic impacts associated with the project are evaluated in EIS Volume I, Chapter 1; Volume I, Chapter 5, Section 5.1.8 and Volume IV, Appendix 14, Section 14.1.2.3.

1554.05

See Comment Response 1126.05.

1554.06

Comments noted.

1555.01

Comments noted.

1555.02

See Comment Response 810.03.

1555.03

Comment noted.

1555.04

Comment noted.

1555.05

Comment noted.

1556.01

As part of site characterization studies, the location of all buried utility lines (water, gas, telephone, power) will be surveyed. Construction contractors will be required to notify utility owners prior to any excavation. In some instances it may become necessary to relocate a utility line around project facilities. This will be done in concert with the utility owner to minimize disruption of service.

1556.02

SSC construction and operations will be conducted in compliance with all relevant statutes and regulations (see EIS Volume I, Chapter 6). Permits will be obtained for storage of hazardous wastes. All wastewater discharges will be permitted in accordance with applicable requirements and advanced treatment technologies will be employed as practicable.

1556.03

SSC facilities including water supply systems will be designed, installed, and operated in compliance with applicable Federal and State regulations. See Volume I, Chapter 6.

1556.04

See Comment Response 1556.03.

1556.05

It is DOE policy to conduct its operations in an environmentally safe and sound manner in compliance with the letter and spirit of applicable environmental statutes, regulations and standards.

If North Carolina is the selected site and land application is the selected method for sludge disposal, the DOE would consult with NRCD-DEM and comply with appropriate guidelines, regulations, and statutes.

1556.06

If North Carolina were the selected site for the SSC and any demolition were to occur during construction at the North Carolina site, the waste generated would be properly disposed in a permitted landfill. The comment concerning hazardous waste is noted.

1556.07

This issue would be addressed by the SSC construction contractor during construction, and the maintenance and operation contractor during operation of the facility.

1556.08

See Comment Response 1556.07.

1556.09

See Comment Response 1556.02.

1557.01

Comment noted.

1557.02

Comment noted.

1557.03

See Comment Response 882.01

1557.04

Impacts to water supplies resulting from construction and operations of the SSC in Illinois are discussed in Volume IV, Appendix 7, Sections

7.1.3.3.G (surface water use) and 7.2.3.3.A.5 (public water supply systems). The proposed water supply for the construction and operations of the SSC in Illinois is groundwater. Therefore, no impacts to quantity of surface water use are expected. Impacts to public water supply systems (mostly groundwater) are expected to be negligible.

Water quality implications of siting the SSC in Illinois are discussed in Volume IV, Appendix 7, Sections 7.1.3.3.F (surface water) and 7.2.3.3.A.4 (groundwater). Construction and operations of the SSC offer the potential for water quality impacts. However, implementation of proper mitigative measures designed to protect the health of the public and the environment, and to conform with applicable statutes and regulations, should reduce the potential impacts to negligible levels.

Regarding well closures see Comment Response 7.03.

1557.05

Impacts to wildlife at the proposed SSC site in Illinois are discussed in EIS Volume I, Chapter 5, Section 5.1.5.4.E. Although wildlife populations have been decreasing in the area due to increasing urbanization, development of the SSC may counter this trend partially by providing opportunities to increase, protect, and/or enhance habitats for wildlife within the boundaries of fee simple areas. The reader is referred to the annual reports of Fermilab for additional information on prairie restoration and wildlife protection.

1557.06

Comment noted.

1553.01

Comment noted.

1558.02

Comment noted.

1558.03

See Comment Response 15.01.

1558.04

See Comment Response 570.01.

1558.05

See Comment Response 1548.121.

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1558.06

See Comment Response 1548.122.

1558.07

Comment noted.

1559.01

Comment noted.

1559.02

The geological/geohydrological data provided by the proposer are summarized in EIS Volume IV, Appendix 5, Sections 5.7.1 and 5.7.2; they were verified against other data sources and by field examination and are considered adequate for this EIS. Also see Comment Responses 217.01, 217.03 and 223.05.

1559.03

See Comment Response 226.01.

1559.04

Comment noted.

1560.01

Comment noted.

1561.01

Comment noted.

1561.02

See last paragraph of Comment Response 979.02

1561.03

See Comment Responses 979.02 and 1292.05.

1561.04

Comments noted.

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