



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

May 30, 2000

SECRETARY

COMMISSION VOTING RECORD

DECISION ITEM: SECY-99-0284

TITLE: CLASSIFICATION OF SAVANNAH RIVER RESIDUAL  
TANK WASTE AS INCIDENTAL

The Commission (with Commissioners Dicus, Diaz, and Merrifield agreeing and Chairman Meserve and Commissioner McGaffigan agreeing in part and disagreeing in part) approved the subject paper as recorded in the Staff Requirements Memorandum (SRM) of May 30, 2000.

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Commission.

Annette L. Vietti-Cook  
Secretary of the Commission

Attachments:

1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Meserve  
Commissioner Dicus  
Commissioner Diaz  
Commissioner McGaffigan  
Commissioner Merrifield  
OGC  
EDO  
PDR

## VOTING SUMMARY - SECY-99-0284

### RECORDED VOTES

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIP	COMMENTS	DATE
CHRM. MESERVE	X	X			X	4/14/00
COMR. DICUS	X				X	2/18/00
COMR. DIAZ	X				X	4/5/00
COMR. McGAFFIGAN	X	X			X	5/12/00
COMR. MERRIFIELD	X				X	4/10/00

### COMMENT RESOLUTION

In their vote sheets, Commissioners Dicus, Diaz, and Merrifield approved the staff's recommendation and provided some additional comments. Chairman Meserve and Commissioner McGaffigan approved in part and disapproved in part the staff's recommendation and provided some additional comments. They approved sending a significantly revised letter to the Department of Energy on classifying the residual tank waste at the Savannah River Site. Subsequently, the comments of the Commission were incorporated into the guidance to staff as reflected in the SRM issued on May 30, 2000.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook  
Secretary of the Commission

FROM: CHAIRMAN MESERVE

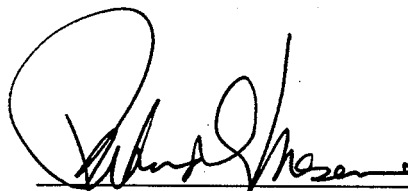
SUBJECT: SECY-99-284 - CLASSIFICATION OF SAVANNAH RIVER  
RESIDUAL TANK WASTE AS INCIDENTAL

Approved   X in part   Disapproved   X in part   Abstain       

Not Participating        Request Discussion       

COMMENTS:

See attached.



SIGNATURE

April 14, 2000

DATE

Entered on "AS" Yes   ✓   No

## Comments of Chairman Meserve on SECY-99-284

I approve sending a letter to DOE noting the NRC's conditional agreement on the acceptability of the DOE's methodology for classification of residual tank waste as incidental, subject to the following comments.

The Commission is confronted in this matter with a request to provide technical assistance to DOE concerning the characterization of certain waste that will remain in the Savannah River tanks after cleaning as "incidental waste," which has the effect of making the waste not subject to restrictions on the disposal of High-Level Waste. DOE and the staff have framed the analysis in terms of three criteria that were developed to define incidental waste at a different site (Hanford) under different circumstances. The criteria were not promulgated as a rule, but rather were approved by the Commission in a Staff Requirements Memorandum for SECY-92-391.<sup>1</sup>

The staff finds it necessary to undertake a somewhat tortured analysis in order to accommodate the fact that DOE is unable to meet criterion 2 -- the requirement that the waste meets the concentration limits for Class C low-level waste. Although the waste remaining in some of the Savannah River tanks after cleanup will likely have radionuclide concentrations that significantly exceed those limits, the staff concludes, based on factors like those provided by 10 CFR 61.58<sup>2</sup> and certain other considerations, that the criterion is adequately satisfied so long as certain specified alternative concentration limits are met. The staff proposes limits of ten times the values in Table 1 of 10 CFR 61.55 at 500 years following tank closure.

I am uncomfortable with the staff approach because the reliance on Section 61.58 to demonstrate conformance with criterion 2 serves largely to collapse criterion 2 into criterion 3. Moreover, the new concentration limits proposed by the staff that would need to be satisfied at

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<sup>1</sup> The three criteria are reflected in a letter to DOE:

"DOE will assure that the waste:

- (1) has been processed (or will be further processed) to remove key radionuclides to the maximum extent that is technically and economically practical;
- (2) will be incorporated in a solid physical form at a concentration that does not exceed the applicable concentration limits for Class C low-level waste as set out in 10 CFR Part 61; and
- (3) will be managed, pursuant to the Atomic Energy Act, so that safety requirements comparable to the performance objectives set out in 10 CFR Part 61 are satisfied."

Letter from R. H. Bernero, NMSS, to J. Lytle, DOE (Mar. 2, 1993).

<sup>2</sup> Section 61.58 provides that, "[t]he Commission may. . . authorize other provisions for the classification and characteristics of waste on a specific basis, if, after evaluation, of the specific characteristics of the waste, disposal site, and method of disposal, it finds reasonable assurance of compliance with the performance objectives in subpart C of [Part 61]." Section 61.58 is thus similar to criterion 3.

a distant future time appear to lack a strong technical basis and would certainly establish a precedent with uncertain consequences elsewhere.

Rather than trying to apply the criteria that were developed for the different circumstances at Hanford to Savannah River and invoking an exemption-like process for concentration limits that has unpredictable implications, it is my view that the Commission should follow a more direct and performance-based approach. The Hanford criteria for incidental waste were developed for a different site and their application to the Savannah River tanks is neither compelled by statute nor embodied in a rule. Accordingly, strict adherence to them is not required. In my view, we should focus on whether DOE's proposed methodology for the Savannah River tanks will be protective of the public health and safety and the environment. We should assess the situation at Savannah River as we find it and determine whether, under the specific circumstances, it is our technical view that DOE's characterization of the remaining waste as incidental waste is protective of the public health and safety and the environment.

Under the circumstances that exist at Savannah River, I would be satisfied with DOE's proposed methodology so long as the first and third criteria are satisfied. In effect, DOE would undertake cleanup to the maximum extent that is technically and economically practical and would achieve performance objectives consistent with those we demand for the disposal of low-level waste. These commitments, if satisfied, should serve to provide protection of the public health and safety and the environment. In this context, DOE should be encouraged to develop concentration limits -- in effect to develop a site-specific alternative to criterion 2 -- in order to bound the analysis and to provide a firm benchmark for satisfactory cleaning of the tanks.<sup>3</sup>

I share Commissioner Merrifield's views that the response to DOE should emphasize that the NRC is offering advice, and is not providing regulatory approval. The letter should emphasize that DOE is responsible for determining whether the waste is "incidental." Moreover, it is appropriate to emphasize that there is considerable uncertainty associated with the assessment of the methodology and that our judgment as to the adequacy of the methodology is dependent on verification that the assumptions underlying the analysis are correct. Finally, we should reinforce that our assessment is a site-specific evaluation that does not have precedential effect under other circumstances.

Although I agree with many of the proposed edits of Commissioner Dicus, I believe fundamental changes in the letter and attachment are necessary to accommodate these views.

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<sup>3</sup> These limits might be based, for example, on site-specific modeling to show that a source term at the concentration limit would satisfy the performance objectives.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: COMMISSIONER DICUS

SUBJECT: **SECY-99-284 - CLASSIFICATION OF SAVANNAH RIVER  
RESIDUAL TANK WASTE AS INCIDENTAL**

Approved <sup>w/comments</sup> x Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_

Not Participating \_\_\_\_\_

COMMENTS:

See attached comments.

Aneta Joy Dicus  
SIGNATURE

February 18, 2000  
DATE

Entered on "AS" Yes x No \_\_\_\_\_

## COMMENTS OF COMMISSIONER DICUS REGARDING SECY 99-284

1. I believe that staff has done an excellent job in conducting its review and analysis of this effort, and in providing logical recommendations to DOE. I concur with a majority of the recommendations that staff has included in the response letter to DOE-SR, but I'm concerned about staff's proposed reclassification limits for Table 1 of 10 CFR Part 61.55 for the following reasons:
  - A. Staff's review concluded that from a safety perspective, they have no concerns with what DOE is proposing for cleanout and immobilization concerning the 51 tanks located in F and H Area Tank Farms;
  - B. 10 CFR Part 61.58, "**Alternative Requirements for Waste Classification and Characteristics**" defers to Subpart C performance objectives, which aside from Part 61.41 (i.e., 25 mrem/year to the whole body, etc.), are qualitative and not quantitative requirements, nor does Part 61.58 reference or state the need for reclassification limit alternatives with respect to Part 61.55 Tables 1 and 2.;
  - C. Staff concluded that DOE's application of the **BTP** criteria on concentration averaging is generally acceptable in this context to meet Class C concentration limits, and recognizes that the alternative provisions for waste classification proposed by DOE are generally similar to those in 10 CFR Part 61.58; and
  - D. OGC's **No Legal Objection** conclusion in-part, that "While staff may provide technical assistance to DOE on DOE's waste classification approach, the authority and responsibility for classifying the waste at Savannah River is in DOE and not NRC."
2. With respect to Comment 1., I have modified the NRC to DOE response letter accordingly.
  - A. Page 1, second paragraph, **DELETE** "Subject to certain modifications below" and begin the sentence with "The DOE tank closure....."
  - B. Page 2, fourth paragraph, beginning with the third from the last sentence, **DELETE** the remainder of the paragraph, "The NRC proposes that the alternative provision for waste reclassification.....Additionally, the administration of an alternative waste classification does not supercede the need to meet all aspects of Criterion One and Three."
  - C. Page 4, first sentence, "piping) have not.....HLW tank bottoms and therefore must meet all.....in 10 CFR 61.55. **DELETE** "must" and **REPLACE** with "should".
  - D. Page 4, second sentence, "Without the proper intruder.....the NRC can not recognize...." **DELETE** "can not" and **REPLACE** with "does not".

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- E. Page 4, third paragraph, second sentence, "See the attached Technical Evaluation Report for further details and additional recommendations."
- ☐ Revise the Technical Evaluation Report per **Comment 1**.
- F. Page 4, fifth paragraph, third sentence, **DELETE** "assuming that DOE-SR satisfactorily addresses the staff recommendations discussed above."
- G. Page 4, fifth paragraph, last sentence, **DELETE** "as well as the proposed alternative waste classification radionuclide concentrations."
- H. Add the following as the last paragraph on Page 4.
- ☐ "The analysis performed regarding the proposed tank closure methodology for the HLW tanks located at the DOE Savannah River Site was performed according to the terms and conditions of the established Memorandum of Understanding and the Interagency Agreement. The analysis and resulting conclusions are specific only to the 51 tanks located at the DOE Savannah River F and H Area Tank Farms and related piping and equipment."

gnd





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

Mr. Roy J. Schepens  
Assistant Manager for High-Level Waste  
U.S. Department of Energy  
Savannah River Operations Office  
P.O. Box A  
Aiken, South Carolina 29802

SUBJECT: SAVANNAH RIVER SITE HIGH LEVEL WASTE TANK CLOSURE:  
CLASSIFICATION OF RESIDUAL WASTE AS INCIDENTAL

Dear Mr. Schepens :

The U.S. Nuclear Regulatory Commission (NRC) has completed the review of the tank closure methodology for the high-level waste (HLW) tanks at the Savannah River Site (SRS). NRC views its role as providing technical assistance to the Department of Energy (DOE), and is not acting in a regulatory role. The focus of the review was whether or not the residual waste left in the HLW tanks, after cleaning, could be labeled as incidental waste as defined by criteria approved by the Commission in the Staff Requirements Memorandum (SRM) dated February 16, 1993, in response to SECY-92-391, "Denial of PRM 60-4 - Petition for Rulemaking from the States of Washington and Oregon Regarding Classification of Radioactive Waste at Hanford," and described in the March 2, 1993, letter from R. Bernero, NRC, to J. Lytle, DOE. NRC staff and contractor staff (Center for Nuclear Waste Regulatory Analyses) performed the review. The review focused on DOE's "Regulatory Basis for Incidental Waste Classification at the Savannah River Site High-Level Waste Tank Farms", "High-Level Waste Tank Closure Program Plan", "Environmental Radiological Analysis, Fate and Transport Modeling of Residual Contaminants and Human Health Impacts from the F-Area High-Level Waste Tank Farm", "Industrial Wastewater Closure Module for the High-Level Waste Tank 17 System", "Industrial Wastewater Closure Module for the High-Level Waste Tank 20 System". It also included the responses (letter from K. Stablein, NRC to R. Schepens, DOE, June 30, 1998) to the request for additional information, as well as information resulting from the April 1, 1999, public meeting between NRC and DOE staff. The results of the NRC staff review are attached.

*Delete* Subject to certain modifications discussed below, the DOE tank closure methodology proposes to use the incidental waste criteria approved by the Commission in the February 16, 1993 SRM and stated in the March 2, 1993, letter from R. Bernero, NRC to J. Lytle, DOE, that were established for the treatment and disposal of removed HLW. Criterion One from the March 1993 letter specifies that "...wastes have been processed (or will be further processed) to remove key radionuclides to the maximum extent that is technically and economically practical." Only water washing and oxalic acid washing were identified as being technically feasible with regards to removal of key radionuclides following bulk waste removal. Water washing and bulk waste removal have been shown to be capable of removing 98% of the initial tank activity. Depending on the initial sludge inventories, oxalic acid washing, or comparable cleaning, will be required on selected tanks, although it is not considered to be economically practical for all 51 tanks.

*2/2*

DOE does not supercede the need to meet all aspects of Criterion One and Three.

In terms of meeting the solid physical form portion of Criteria Two, the staff believe that the waste has been sufficiently immobilized to help prevent inadvertent intrusion. By utilizing three different types of grout the waste is further protected. The initial reducing grout pour helps to reduce the mobility of the radionuclides. The middle layer of grout provides a solid foundation to guard against subsidence, and finally the top layer of strong grout provides protection against physical penetration of the waste. Therefore, the physical form requirements of Criteria Two are considered to be met.

Satisfying Criterion Three, "...wastes are to be managed, pursuant to the Atomic Energy Act, so that safety requirements comparable to the performance objectives set out in 10 CFR Part 61 are satisfied," involves the evaluation of the tank farm performance assessment (PA).

DOE has indicated that it intends to meet a 4 mrem/yr drinking water dose limit. From standard dose modeling methodology, the drinking water dose is expected to be the largest dose contributor pathway. It appears from the performance assessment that the 4 mrem/yr drinking water dose limit can be met, and by extrapolation, the 25 mrem/yr total effective dose equivalent (TEDE) requirement of 10 CFR 61.41 can be met. In meeting the performance objective of §61.41, reliance on institutional controls beyond 100 years will not be needed although DOE has proposed institutional controls in perpetuity. Future PA's should focus on meeting the performance objectives of 10 CFR Part 61 Subpart C and should not rely on any active institutional controls beyond 100 years. The NRC staff have concluded that there is reasonable assurance that safety requirements comparable to §61.41 can be satisfied.

To show protection of an inadvertent intruder, the standard agriculture scenario consists of a farmer who lives at the tank farm, and drills a well near the tank farm and then uses the well water to irrigate his crops and feed his livestock as well as himself. DOE-SR has provided only calculated drinking water doses for this intruder scenario. DOE's intruder PA showed that the maximum drinking water dose the farmer would receive via the ground-water pathway was 130 mrem/year at a well distance of 1 meter from the tank farm, at approximately 700 years. According to DOE-SR, the drinking water dose pathway is expected to be the highest dose contributor, and therefore provides reasonable assurance that the 500 mrem/year limit, used as a basis for waste classification, to show protection of individuals from inadvertent intrusion, can be met. The DOE-SR analysis assumes all activity is contained within the reducing grout layer located at the bottom of each tank, and that this contaminant zone is not disturbed. This then implies that there is no activity in any vertical component of the tank structure, and therefore, a typical construction scenario (with a 10 foot deep basement) would not disturb any contaminated portion of the tank structure.

Staff recommends that future performance assessments for SR tank closures, including individual tank closure modules, and the H-Tank Farm Fate and Transport Modeling, include the full agriculture scenario (all pathways) as well as the discovery scenario, as described in the Draft Environmental Impact Statement for 10 CFR Part 61. Staff also notes that closure of ancillary piping and equipment must consider an inadvertent intruder. That is, performance assessment must consider disturbed surface piping and equipment, which in addition to tank sources, must not exceed the 500 mrem per year (all pathways, total effective dose equivalent) for the discovery and agricultural scenarios. Furthermore, all external components (e.g.,

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R. Schepens

- 5 -

If you have any question about the details of this letter, please contact Jennifer Davis of my staff at (301) 415-5874.

Sincerely,


William F. Kane, Director  
Office of Nuclear Material Safety  
and Safeguards

Attachment: As stated

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER DIAZ  
SUBJECT: **SECY-99-284 - CLASSIFICATION OF SAVANNAH RIVER  
RESIDUAL TANK WASTE AS INCIDENTAL**

Approved XX  Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_  
Not Participating \_\_\_\_\_

**COMMENTS:**

The staff has performed a thorough technical analysis of the DOE methodology for classifying residual wastes as incidental in the tanks at the Savannah River Site. I approve transmittal of the letter attached to SECY-99-284, provided that it is revised to clarify that, while the NRC does not disagree with DOE's methodology, this is a one-time evaluation applicable only to the 51 Savannah River tanks and does not prejudice any similar future waste classification efforts.

Also, the references to specific concentration limits based on 10 CFR Part 61.55 should be deleted from the letter, as proposed by Commissioner Dicus. 

--REC'D BY NJD--

17 DEC 99 3:24

  
\_\_\_\_\_  
SIGNATURE

4/5/00  
\_\_\_\_\_  
DATE

Entered on "AS" Yes XX No \_\_\_\_\_

# RESPONSE SHEET

Approved 2 <sup>in part</sup> Disapproved 2 <sup>in part</sup> Abstain \_\_\_\_\_  
w/comment

Edward M. Tupper Jr.

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SIGNATURE

May 12, 2000

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DATE

Entered on "AS" Yes ☒ No

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER MERRIFIELD  
SUBJECT: **SECY-99-284 - CLASSIFICATION OF SAVANNAH RIVER  
RESIDUAL TANK WASTE AS INCIDENTAL**

Approved ✓ Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_

Not Participating \_\_\_\_\_

COMMENTS:

*See attached comments.*

  
\_\_\_\_\_  
SIGNATURE

*4/10/00*  
\_\_\_\_\_  
DATE

Entered on "AS" Yes ✓ No \_\_\_\_\_

Comments from Commissioner Merrifield on SECY-99-284:

I approve, with modifications as described in the following paragraphs, the staff's draft letter (with attached detailed comments) to DOE concerning the classification of Savannah River Residual Tank Waste as incidental waste. I commend the staff for doing a creditable review on a complex issue. However, it is important to emphasize that the high level waste (HLW) at Savannah River is not subject to NRC's licensing jurisdiction under Section 202 of the Energy Reorganization Act of 1974, as amended. The classification of particular wastes at Savannah River as HLW, "incidental waste", or some other category is a matter under DOE's authority and responsibility. In an arrangement between the State of South Carolina and DOE, DOE is requesting NRC's agreement that the residual tank waste is incidental. The NRC comments back to DOE should indicate agreement in principal with the DOE process with specific comments but also should clearly indicate that it is NRC's advice and not regulatory approval that is being provided. Nothing in this regulatory advice would establish a precedent if DOE were to submit a licensing action requiring NRC regulatory approval at this site or another site in the future. This is simply site specific advice based on DOE having the lead regulatory authority. This point needs to be emphasized in the first paragraph of the transmittal letter to DOE.

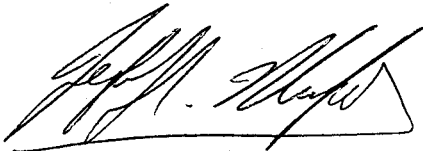
In the past, the Commission has agreed to the classification of waste in HLW storage tanks at Hanford as incidental based on three criteria. The first criteria was that the tanks would be decontaminated to the maximum extent technically and economically feasible. The second criteria was that the remaining waste not be greater than class C waste as defined in 10 CFR Part 61. The third criteria was that the site where the tanks were disposed would meet the performance criteria of 10 CFR Part 61. I agree with the criteria used at Hanford because they state that the waste should be equivalent to class A, B or C low level waste and the disposal site must meet the objectives of the NRC low level waste regulations. At Savannah River, DOE is fairly confident that criteria 1 and 3 can be achieved. But for a number of tanks, DOE will not be able to achieve criteria 2. The staff is in general agreement with the methodology proposed by DOE (including the use of concentration averaging for some solidified tank wastes) and provides some specific comments for improvements in the DOE analysis. These comments should be provided to DOE.

However, for the Savannah River tanks, DOE desires to modify the second criteria used at Hanford by using a provision in the NRC low-level waste regulations (10 CFR 61.58) which would allow the Commission to establish an alternative to the waste classification system if the resulting disposal met the performance objectives of 10 CFR Part 61 (essentially by achieving criteria 3 of the Hanford criteria DOE proposes that criteria 2 no longer applies). Although the staff is in general agreement with the DOE proposal, the staff believes there should be some constraints on using 10 CFR 61.58 and have proposed additional criteria for limiting DOE's actions (i.e., limiting concentrations to less than ten times the value of Table 2 of 10 CFR 61.55 and starting the analysis at 500 years after disposal). As explained in subsequent paragraphs, the staff should not provide this specific additional criteria to DOE at this time. I believe the staff should recommend that DOE develop additional criteria placing limits on its own regulatory decision; but DOE should have the lead in establishing and defending this specific criteria.

First, I want to state that I share staff concerns that some additional limits should be placed on the use of the exemption allowed by 10 CFR 61.58 based on the total magnitude of the disposal proposed at Savannah River. The intent of §61.58 was to allow the Commission flexibility when dealing with site specific circumstances, but this section was not written to provide generic relief

from the waste classification system for any site which could meet the Part 61 performance objectives. NRC's low-level waste classification tables have a long history and are even specifically mentioned in legislation. Although there have been multiple petitions to change the waste classification system, the Commission has maintained the criteria relatively constant since Part 61 was initially published.

§61.58 does allow the Commission to approve exceptions to the waste classification system, but this site specific action is not under NRC regulatory action. I am not implying that if the NRC were faced with a regulatory decision for the Savannah River tanks that the NRC may or may not approve the action proposed by DOE and that the Commission may or may not approve the additional restrictive criteria as proposed by the staff. In fact, I commend the staff for its initiative in proposing additional criteria for this site specific review. But if the NRC had regulatory authority over this specific action, at a minimum, the NRC would produce an Environmental Assessment (and possibly an Environmental Impact Statement) and the licensing procedure itself would offer the opportunity for the public to request a hearing. Due to its precedent setting nature, it is also highly likely that the Commission would offer the new criteria for public comment. In any event, the criteria established by the Commission would be done in a manner accessible to the public. The final criteria established in this public process may or may not be identical to what the staff has proposed. But on a site where NRC does not have regulatory authority and does not have control of the process for public involvement, I am reluctant to provide specific criteria to be applied under §61.58. However, I do believe it is appropriate for the staff to encourage DOE to consider additional criteria other than saying that unlimited quantities of waste in greater than class C concentrations can be disposed of at a site as long as the performance objectives of Part 61 can be met.

A handwritten signature in black ink, appearing to read "Jeff M. Mays". The signature is written in a cursive, flowing style with a large, stylized initial "J".

4/10/00